



# Texas Longleaf Ridge Restoration Project

A Collaborative Forest Landscape Restoration Program Proposal



## Executive Summary

**Dominant forest type(s):** loblolly, shortleaf, and longleaf pine.

**Total acreage of the landscape:** 230,000. **Total acreage to receive treatment:** 101,491

**Total number of NEPA ready acres:** 16,804. **Total number of acres in NEPA process:** 23,382

**Description of the most significant restoration needs and actions on the landscape:**

1) Re-establishing longleaf pine on approximately 3,300 acres through regeneration cuts and plantings; 2) Re-establishing longleaf pine on approximately 3,900 acres through irregular thinning and underplanting; 3) Improving approximately 62,500 acres through overstory thinnings ; 4) improving understory conditions through controlling woody vegetation and reducing invasive species on 7,000 acres using treatments such as mulching, mowing, and herbicide application; 5) Restoring native herbaceous ground layer through direct seeding on approximately 1,500 acres; 6) Maintaining functional integrity of longleaf pine ecosystems on approximately 50,000 acres per year through prescribed burning programs that mimic, as closely as possible, the frequency, intensity and the seasonality of natural fire regimes.

**Description of the highest priority desired outcomes of the project at the end of the 10 year period:**

1) A functional longleaf pine landscape in the Longleaf Ridge Conservation Area with adequate size and connectivity for maintaining viable populations of all associated species and examples of natural community types, 2) presence of the structure, composition, and function of native longleaf pine ecosystems within the range of natural variability, 3) benefits to local communities and economies, 4) numerous conservation education and volunteer opportunities, and 5) reduced risks of damaging wildfires.

**Description of the most significant utilization opportunities linked to this project:** The majority of the material would likely be used as saw wood in mills and the rest as pulpwood, and as fuel in biomass facilities.

**Name of the National Forest, collaborative groups, and other major partner categories involved in project development:** National Forests and Grasslands in Texas and members of the Texas-Louisiana Longleaf Pine Taskforce.

**Describe the community benefit including number and types of jobs created.** Approximately 400 full-and part-time jobs will be created through direct restoration efforts and through positions in sawmills and biomass facilities.

**Total dollar amount requested in FY11:** \$1,599,000

**Total dollar amount requested for life of project:** \$16,113,000

**Total dollar amount provided as Forest Service match in FY11:** \$1,676,000.

**Total dollar amount provided as Forest Service match for life of project:** \$16,544,000

**Total dollar amount provided in Partnership Match in FY11:** 3,000

**Total dollar amount provided in Partnership Match for life of project:** 10,000

**Total in-kind amount provided in Partnership Match in FY11:** \$56,000

**Total in-kind amount provided in Partnership Match for life of project:** 100,000

**Time frame for the project (from start to finish):** from 2011 to 2021.

## Table of Contents

Ecological, Social and Economic Context.....	1
Summary of Landscape Strategy .....	4
Proposed Treatment.....	7
Collaboration and Multi-party Monitoring.....	14
Utilization.....	17
Benefits to Local Economies .....	18
Funding Plan .....	20

### Attachments

- Attachment A: Planned Accomplishment Table
- Attachment B: Reduction of related wildfire management costs
  - “Results – Cost Savings” of R-CAT spreadsheet
  - Documentation of assumptions and data sources used when populating the R-CAT spreadsheet
- Attachment C: Members of the Collaborative Table
- Attachment D: Letter of Commitment
- Attachment E: Predicted Jobs Table from TREAT spreadsheet
- Attachment F: Funding Estimates
- Attachment G: Map

## ***Ecological, Social and Economic Context***

The Longleaf Ridge Conservation Area contains some of the best remaining examples of large, intact, and highly diverse longleaf pine ecosystems in the West Gulf Coastal Plain (WGCP). It consists of a mosaic of public and private lands, and encompasses approximately 230,000 acres including 117,272 acres of National Forest System (NFS) lands within the southern Angelina National Forest (NF) and southern Sabine NF. There are also large tracts of timber industry lands and private non-industrial forestlands with significant opportunities for longleaf pine restoration. Currently, the NFs in Texas is working in collaboration with other federal, state and private groups to establish core areas of high quality longleaf pine ecosystems and compatibly managed private lands that will ultimately create a habitat corridor for longleaf pine, red-cockaded woodpeckers and other associated species that would stretch for roughly 27 miles from the eastern edge of the Angelina NF and along the entire southern edge of the Sabine NF to its most southeastern corner (Fig. 2).

### **Ecological Characteristics**

Prior to European settlement, approximately 2,890,000 acres in Longleaf Ridge and the surrounding east Texas landscape was dominated by longleaf pine in open park-like stands with scattered hardwoods (Mohr 1897). Frequent fires sparked by lightning or by Native Americans held encroaching hardwoods in check and maintained a highly diverse understory dominated by grasses and other herbaceous plants. Pioneer settlement and intensive logging of longleaf pine altered the ecosystem by the early 1900's. Plantation forestry and fire suppression in the years to follow allowed loblolly pines, slash pines and hardwoods to dominate on many former longleaf pine sites. Due to alteration of natural fire regimes, there also has been an unnatural buildup of duff, litter and the woody understory vegetation and forest fuel loads have increased to hazardous levels in many areas.

There are still remnant areas of high quality longleaf pine habitat in Longleaf Ridge (21,000 acres represent about 0.7% of the original extent of longleaf in Texas) and much of the remaining area is considered highly restorable. Longleaf Ridge has been identified by the Nature Conservancy as one of the top six conservation priorities in Texas with the highest biodiversity rankings in the ecoregion. The Nature Conservancy considers Longleaf Ridge to be one of only 17 natural areas with fully functional ecosystems out of 81 sites analyzed in east Texas and western Louisiana. Of those 17, the greatest biological diversity was recorded on Longleaf Ridge.

Longleaf Ridge is a designated Habitat Management Area (HMA) for the federally listed endangered red-cockaded woodpecker and it currently supports 63 active and 18 inactive clusters on NFS lands. Although the population on the Sabine NF appears to be on a downward trend, the Angelina NF population is trending upward. Longleaf Ridge also contains the best remaining habitat for the Louisiana pine snake, a candidate for federal listing.

In addition to the excellent examples of the longleaf pine woodlands and savannas, the Ridge also contains rare community types such as the Catahoula barrens, hillside seepage bogs, beech forests and evergreen shrub swamps (baygalls). Several plant species of concern include the yellow fringeless orchid, snowy orchid, tiny bog-buttons, Harper's yellow eyed grass, slender gayfeather, bog coneflower and possibly nodding yucca. Longleaf Ridge is also an important bird migration corridor and excellent habitat for priority bird species such as Bachman's sparrow, Swainson's warbler, Kentucky warbler, northern bob-white quail, brown-headed nuthatch and American woodcock. The Ridge also supports thriving populations of white-tail deer, wild turkey and small game.

### **Role of Fire**

Fire is an inherent and essential component in longleaf pine ecosystems. Longleaf pine and bunchgrasses function together as the keystone species in a complex of fire-dependent plant communities within the proposed project landscape. Prior to European settlement, it is estimated that light surface fires swept through these landscapes once every 1 to 5 years. This fire frequency was essential to perpetuation of these communities (Martin and Smith 1993). If left untreated, these systems quickly build up high levels of hazardous fuels. In the prolonged absence of periodic, low-intensity fire, low-intensity fires, these ecosystems undergo rapid changes in species composition and structure and develop a build-up of hazardous fuels. The conditions, in turn, become predisposing factors to epidemic insect and disease outbreaks and stand replacement fires. The current fuel conditions within the proposed project area are variable. Approximately 26% of the landscape is within the range of natural variability (condition class 1) and the remainder has uncharacteristic fuel buildups due to fire suppression and exclusion (condition classes 2 or 3).

The fire management goal on Longleaf Ridge is to utilize prescribed burning to mimic the frequency, intensity and seasonality of the natural fire regimes and to restore the structure, composition and function of the native fire-dependent ecosystems. The proposed treatments will reduce the risks of uncharacteristic wildfire and provide for a wider range of wildfire responses.

### Social and Economic conditions

Longleaf Ridge consists of a mosaic of public and private lands with potential for numerous ecological, economic and social benefits. Public lands, comprising about 50% of the area, are mostly forested and consist of numerous core conservation areas with scenic and recreational values. A part of Longleaf Ridge within the Angelina NF has been designated a Special Area by the U.S. Forest Service in recognition of its unique scenic, botanical and wildlife resources. There are also two large reservoirs (Sam Rayburn and Toledo Bend) within the project landscape with associated urban development and recreational facilities.

Private lands, comprising the remaining 50% of the area, consist of a patchwork of industrial and non-industrial forests, agricultural lands, and residential areas. Private forestlands offer valuable timber revenues to the local economies. Local markets include chip, paper, plywood, oriented strand board and sawtimber. Hunting and wildlife management are also valuable social benefits. The inclusion of private forestlands adjacent to federal lands will better position the states for program funding that provides assistance to rural landowners. It is

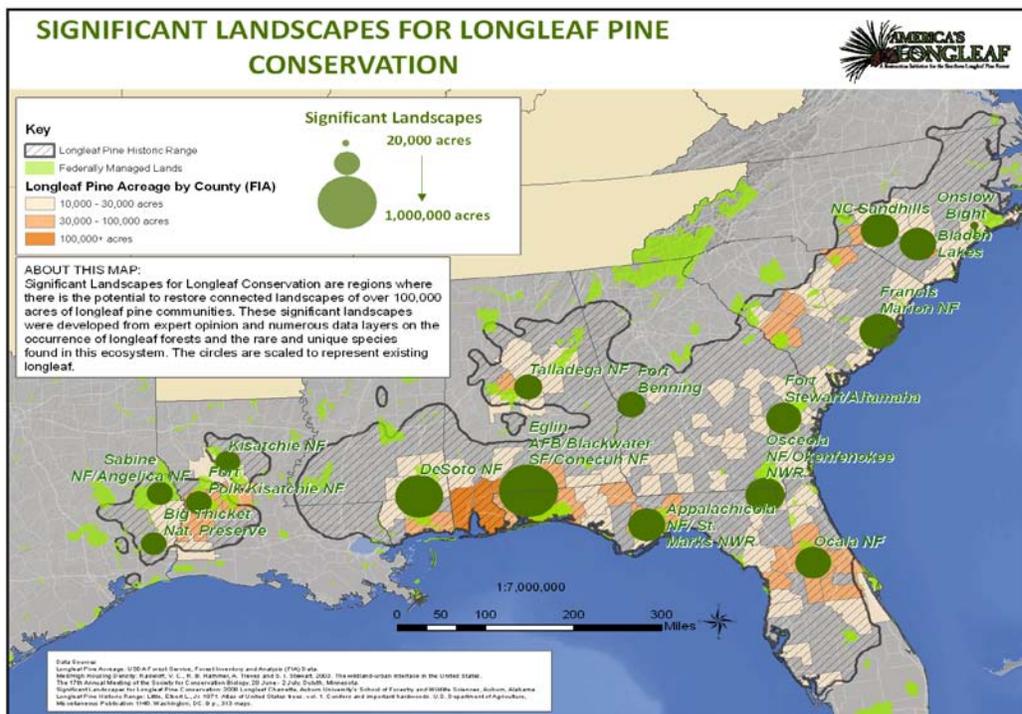


Figure 1. The Angelina and Sabine National Forests in Texas are prime components of the Significant Landscapes for Longleaf Pine Conservation

estimated that the project would provide numerous conservation education opportunities; create approximately 400 full- and part-time jobs directly related to longleaf pine restoration; and contribute approximately \$50,000,000 to the Gross Regional Product over a ten-year period. And from a socio-cultural perspective, longleaf pine is significant to many American Indian Tribes, in particular the Alabama-Coushatta tribe of Texas. Additionally, the project would directly support a multi-organizational effort, hereafter referred to as the *Texas-Louisiana Longleaf Pine Task Force*, to describe the collective and ongoing longleaf pine restoration activities in Texas and Louisiana. In turn, the Task Force supports the larger, range-wide *America's Longleaf* Restoration Initiative. The Texas Longleaf Ridge Restoration Project forms the core of one of the Significant Landscapes for longleaf pine conservation identified by *America's Longleaf* Initiative (Fig. 1).

### ***Summary of Landscape Strategy***

A Regional Working Group of diverse conservation organizations was formed to develop *America's Longleaf - A Restoration Initiative for the Southern Longleaf Pine Forest* in 2007. As part of this focused, range-wide conservation effort, the NFs in Texas recently renewed its efforts to improve and expand longleaf pine restoration actions on US Forest Service lands and to work in collaboration with numerous public and private organizations to promote broad support for longleaf pine conservation and to assist other partners in their efforts to restore longleaf pine. To achieve the restoration goals, the NFs in Texas joined with its partners in establishing the *Texas-Louisiana Longleaf Pine Taskforce*, a multi-organizational group committed to working at the local two-state level to promote longleaf restoration and to support the larger range-wide *America's Longleaf Restoration Initiative*.

The best examples of longleaf pine ecosystems in Texas lie within the Longleaf Ridge Conservation Area (Fig. 2), which encompasses over 230,000 acres including the southern Angelina and Sabine NFs as well as the numerous adjacent private lands. The area was designated by the *America's Longleaf* Initiative as one of the *Significant Landscapes* for longleaf pine conservation (Fig. 1). In addition, the area has been identified as one of the highest conservation priorities in the state of Texas. Following are the key components of the landscape restoration strategy for Longleaf Ridge that the NFGT will pursue in partnership with the *Texas-Louisiana Longleaf Pine Taskforce*. The entire Landscape Strategy for Longleaf Ridge Conservation Area can be found on the O Drive in the associated document, *Restoration of the Longleaf Pine Ecosystems of Longleaf Ridge: A Landscape Strategy*.

## **An Ecosystem Management Approach**

The project will utilize an ecosystem management approach that incorporates social, economic and ecological concerns. To fulfill this mission, longleaf pine restoration efforts on the NFs in Texas will require more than just restoring the timber resource. The efforts will also include re-establishing all appropriate ecosystem components such as native ground cover communities, wildlife, endangered species habitat and prescribed burning programs that mimic the historic fire regimes. Aesthetics, recreation and scientific investigation will also be priorities.

## **Core Areas and Habitat Corridors**

The primary landscape strategy is to establish core areas of high quality longleaf pine ecosystems on NFS lands within the Longleaf Ridge Conservation Area (Fig. 2) and to promote and assist with longleaf pine conservation on adjacent private lands. Core areas will provide habitat for numerous plant and animal species of conservation concern and will serve as demonstration sites for longleaf restoration and management techniques. A major goal of the NFs in Texas is to restore and maintain the structure, composition, and function of native longleaf pine ecosystems in the core areas and to sustain the full spectrum of biodiversity the areas support.

Over 90% of the NFS lands in Longleaf Ridge are within an HMA for the federally listed endangered red-cockaded woodpecker. Because longleaf pine is the preferred species for the woodpecker habitat, efforts are underway to better integrate programs to effectively achieve common desired conditions for expanding their habitat and increasing acreage of longleaf pine. A long-range goal is to establish a habitat corridor connecting the Angelina and Sabine NFs that consists of productive, compatibly-managed longleaf pine forests on private lands (Fig. 2). The habitat corridor would facilitate movement of species such as the red-cockaded woodpecker as well as less mobile species such as the Louisiana pine snake.

## **Private Lands**

The strategy for project work on private lands consists of two major components: 1) providing financial and technical assistance to landowners through a host of federal and state funded longleaf pine incentive programs and 2) acquiring purchased or donated conservation easements through the Forest Legacy Program or private conservation organizations. Numerous private land projects are already underway in Longleaf Ridge (Figure 2). For example, Campbell Group, LLC owns a block of approximately 60,000 acres in the proposed habitat corridor bridging the two national forests and they are interested in selling conservation easements to maintain the area as a working forest while providing an important wildlife

corridor. In 2010, they established a conservation easement on 4,850 acres through the Forest Legacy Program and are planning a second project of 3,500 acres in 2011. The Conservation Fund is also working with The Campbell Group to protect Rocky Branch Barrens, a 2,150 acres site adjacent to the Angelina National Forest that would protect the globally endangered Catahoula Barrens ecosystem. About 450 acres of the area has already been replanted with longleaf pine through a partnership with the National Wild Turkey Federation. Another key private tract within Longleaf Ridge is Temple Inland's Scrappin' Valley Preserve, a 3,000 acre red-cockaded woodpecker management area owned by Temple-Inland and containing significant longleaf pine habitat near the Sabine National Forest. Hancock Timber is another major Timber Investment Management Organization that owns a large block of timberland adjoining the southern Sabine National Forest and that has expressed interest in participating in the Longleaf Pine Taskforce. There is also a large privately owned non-industrial tract of 2,300 acres bordering the Sabine NF that was recently placed in a working conservation easement through the Forest Legacy Program.

There are also a number of smaller non-industrial landowners within the area with potential longleaf pine habitat. Although some of these landowners may not have the resources or opportunities for implementing the full scope of restoration and management activities that are conducted on NFS lands, the technical knowledge and experience gained through US Forest Service management projects will be made available for private landowners as needed.

### **Restoring Fire Regimes**

The fire management strategy is to closely mimic the processes and effects of the natural fire regime utilizing a program of frequent, low intensity prescribed burning. Burns will be conducted primarily on a two year frequency with the majority of burns conducted in the early growing season. In problem areas where there are heavy loads of understory fuels such as yaupon thickets and young loblolly pine plantations, an appropriate combination of mechanical or chemical treatments may also be used to more effectively control hazardous fuels. Treated sites would be expected to develop an open, grassy understory and benefit from natural pruning that reduces vertical continuity and greatly reduces the threat of high-intensity wildfires. The NFs in Texas will continue to emphasize and expand growing season burning in order to mimic natural processes and to more effectively achieve restoration objectives. The Forest Service will also burn on some adjacent private lands to achieve mutually desired benefits. The burns will be conducted under the authority of the Wyden Amendment and at no cost to the landowner.

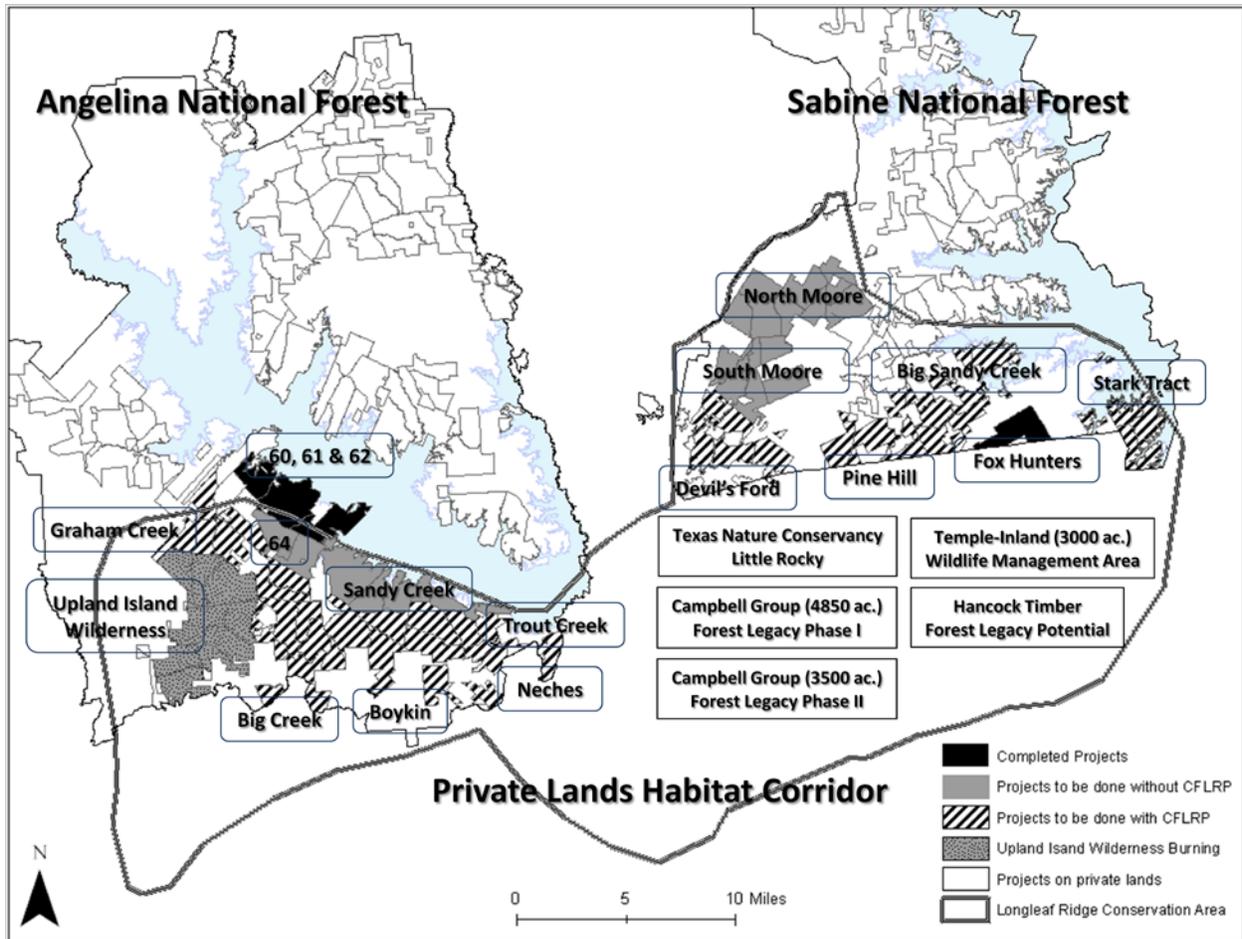


Figure 2. Texas Longleaf Ridge Restoration Project: Longleaf pine projects that will be completed in the next ten years with and without CFLRP funding on National Forest lands.

### Restoration of an Herbaceous Ground Layer

Longleaf pine communities are among the most species-rich communities outside the tropics, largely due to the diversity within the ground layer vegetation. Restoration of native groundcover vegetation is important for restoring biodiversity, enhancing wildlife habitat, and providing the fine fuel needed to carry the frequent low intensity fires that perpetuate the ecosystem. Existing ground layer communities will be enhanced through a program of prescribed burning, selective use of herbicides to control competing woody species, and minimizing ground disturbing mechanical site preparation. However, extremely fire-suppressed areas and sites with intensive site preparation may lack native herbaceous understory communities. Where there are no seed banks or vegetative remnants on the site, restoration of the herbaceous layer may be required. Seeds of native herbaceous species will be collected and replanted on appropriate sites through direct seeding.

### ***Proposed Treatments***

The first step in identifying the priority sites for longleaf pine restoration treatments was to determine the current longleaf pine conditions on the Forest. In the summer of 2010, a field survey was conducted to categorize the status of ground layer, midstory and canopy conditions in existing longleaf pine stands and in other stands that have a high potential for longleaf pine restoration. Due to constraints of time and resources, the project focused only on stands that are typed as longleaf pine or longleaf pine mixtures in Longleaf Ridge on the Angelina and Sabine NFs.

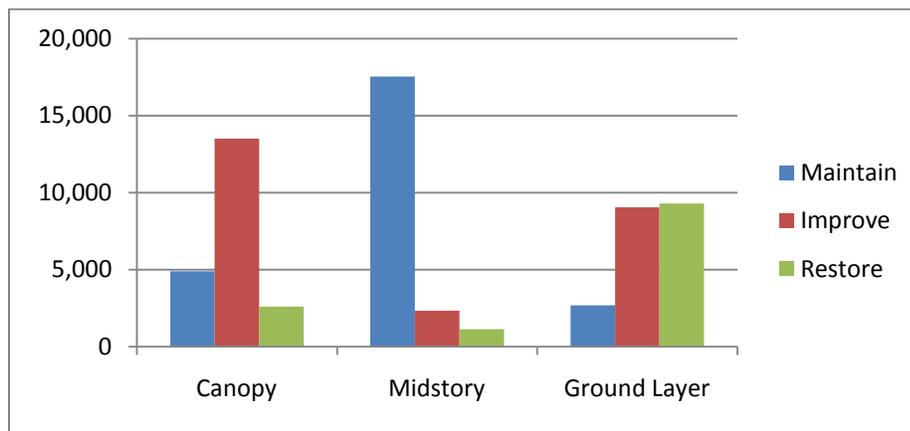


Figure 3. Acres by management class for three vegetation strata from 376 longleaf pine stands encompassing 20,989 acres in Longleaf Ridge on the Sabine and Angelina National Forests.

Visual estimates were used in collecting data for each stand during field surveys. Basal area classes were used in assessing canopy conditions and cover class estimates were used for midstory and ground layer components. Based on the condition, a management class was assigned to each vegetation layer. A total of 376 longleaf pine stands encompassing 20,989 acres was assessed for current condition class in the Longleaf Ridge Conservation Area (Fig. 3). The results indicated that significant efforts were needed in improving and restoring canopy and ground layer conditions in these existing longleaf pine stands.

For sites that were not typed as longleaf pine, individual factors were considered including soil texture, slope position, prescribed fire history, ecological land type phase, and historical range of longleaf pine to determine longleaf potential. Other considerations for sites selection included proximity to existing longleaf pine restoration sites within and adjacent to the proposed project area to augment landscape connectivity, and the readiness of appropriate environmental analysis and decision documents. The overall analyses resulted in the identification of 13 priority restoration project areas encompassing about 80,800 acres on NFS

lands in the Longleaf Ridge Conservation Area that are proposed for thinning or regeneration treatments (Table 1).

<b>Project</b>	<b>NEPA (Yr)</b>	<b>Extent (Ac)</b>	<b>Expected Completion Status</b>
North Moore	2010	4,842	Without CFLRP
Compartment 64	2011	1,494	Without CFLRP
Sandy Creek	2011	6,000	Without CFLRP
South Moore	2012	6,974	Without CFLRP
Trout Creek	2012	7,084	With CFLRP
Pine Hill	2014	4,982	With CFLRP
Boykin	2015	5,000	With CFLRP
Big Sandy Creek	2016	5,835	With CFLRP
Devil's Ford	2017	5,590	With CFLRP
Stark Track	2018	4,127	With CFLRP
Big Creek	2019	6,000	With CFLRP
Graham Creek	2020	2,400	With CFLRP
Neches	2021	2,148	With CFLRP
<b>Total</b>		<b>62,476</b>	

Table 1. NEPA completion year, acres, and expected completion status with or without CFLRP funding on National Forest lands in Texas in the Longleaf Conservation Area.

The 13 individual watershed based projects and the Upland Island Wilderness prescribed burning project are expected to be completed within a ten-year time frame if CFLRP funds are made available (Figure 2). All thinning and regeneration operations will be conducted within the identified project areas. Prescribed burning efforts will focus on all potential longleaf pine types and Upland Island Wilderness. The completion of the 13 projects would vastly increase the connectivity of high-quality longleaf pine lands within the Longleaf Ridge Conservation Area. Without CFLRP funding, it is estimated that only 4 of the 13 projects could be completed within the next ten years (Table 1).

## **Restoration Goals, Treatment Objectives and Outcomes**

The ecological restoration goal is to restore or improve the quality of longleaf pine ecosystems on approximately 101,491 acres of NFS Lands identified as potential longleaf pine habitat in the Longleaf Ridge Conservation Area

Treatment objectives for the ten year project are:

- 1) Re-establishment on regeneration cuts: Regeneration cuts will focus on young loblolly stands in order to maintain all existing foraging within the red-cockaded woodpecker HMA and to remove

off-site species. There are approximately 3,419 acres currently identified for longleaf pine regeneration on the sites.

- 2) Re-establishment with irregular thinning and underplanting: The technique will be used primarily in HMAs where basal area requirements limit the acreage allowed in regeneration cuts and where understory conditions are adequate. Although most units do not have mapped areas for treatment, it is anticipated that approximately 3,900 acres will be utilized for irregular thinning and underplanting.
- 3) Overstory thinning: Approximately 62,476 acres are proposed for thinning using CFLRP funding. Without CFLRP the target is approximately 30,356 acres for overstory thinning.
- 4) Improving understory conditions: The treatments include control of woody vegetation and reduction of invasive species using treatments such as mulching, mowing, and herbicide application. Approximately 7,000 acres are proposed, primarily on regeneration sites and access road
- 5) Restoring ground layer: Plans are underway to develop the capacity to restore native herbaceous ground layer communities through removal of non-native invasive species (NNIS) and direct seeding of selected species. The proposed target is to conduct restoration on 3,000 acres of primarily regeneration cuts and NNIS treatments on 200 acres.
- 6) Prescribed burning: The objective is to utilize prescribed burning on intervals of 2 years or less in all potential longleaf pine sites. Currently, the district is prescribed burning approximately 29,000 acres per year in the Longleaf Ridge. To achieve the desired frequency it will be necessary to increase the acreage to approximately 50,000 acres per year and it would include burning about 6,000 acres per year in the Upland Island Wilderness (Fig. 2). The value represents an increase of about 21,000 acres per year or a 74% increase in acres burned and CFLRP funds would be used to achieve this goal.

## **NEPA-Ready Projects**

Although a 30-year history of litigation has severely limited the ability to actively manage NFS lands in Texas, approximately 26,000 acres of high quality longleaf pine have been restored and maintained through active management since 1990. The legal and political climate is right to actively manage for the re-establishment, improvement and maintenance of healthy, functional longleaf pine ecosystems now that the burden of litigation has been removed and the NFs in Texas has made substantial progress in developing collaborative partnerships with formerly adversarial groups. Importantly, The NFs in Texas have completed the environmental analysis for 4,804 acres of thinning projects and the 12,000 acre Upland Island Wilderness burning project. In addition, 12,336 acres of projects (North Moore, Sandy Creek, and Compartment 64) are in the current NEPA progress and projects totaling 50,140 acres are in line for future evaluations (Table 1).

## **Wildfire**

The forested ecosystems of the proposed project, including longleaf pine communities, are fire-dependent. If left untreated, the systems quickly build up high levels of hazardous fuels. In the prolonged absence of periodic, low-intensity fire, the ecosystems undergo rapid changes in species composition and structure. The resultant conditions, in turn, become predisposing factors to epidemic insect and disease outbreaks and stand replacement fires.

The current fuel conditions within the proposed project area are variable and can be described in terms of the departure of the fire regime from historic conditions. Approximately 26% (29,900 acres) of the landscape is within the range of natural variability (fire regime condition class 1), 24% (27,900 acres) is moderately altered (condition class 2), and 50% (58,000 acres) is significantly altered from the historical range (condition class 3) with highly uncharacteristic fuel buildups. Wildfire behavior in areas of high fuel concentrations, such as heavy yaupon fuels and young loblolly pine plantations, can be extreme.

### Addressing Uncharacteristic Wildfire

The proposed treatments will provide for an appropriate response to uncharacteristic wildfire. Specifically, we propose to re-establish the natural fire regimes characteristic of longleaf pine ecosystems. To that end, we will utilize short-interval prescribed burning, including growing season burns, and an appropriate combination of other treatments to control the structure and composition of the overstory and understory. Treated sites would be expected to develop an open, grassy understory and benefit from natural pruning that reduces vertical continuity and greatly reduces the threat of high-intensity wildfires. The wildfires that do occur will be evaluated for watershed damage that may require necessary rehabilitation measures. The Forest Burned Area Emergency Response Team coordinators will be advised of wildfire-burned areas needing restoration. In particular, attention will be focused on known fragile and sensitive soils where watershed damage from wildfire is more likely to occur.

### Establishing and Maintaining Natural Fire Regimes

Longleaf pine and bunchgrasses function together as the keystone species in a complex of fire-dependent plant communities within the proposed project landscape. Prior to European settlement, it is estimated that light surface fires swept through these landscapes once every 1 to 5 years. This fire frequency was essential to perpetuation of these communities (Martin and Smith 1993). Prescribed burns are conducted each year on NFS lands within the project area. Repeated burning is necessary to replicate natural fire regimes and to protect the considerable investment in prescribed burning over the years. Growing season burning is an efficient and effective means of restoring and maintaining natural longleaf pine ecosystems, as well as

controlling flammable live fuels such as yaupon and waxmyrtle, and deciduous hardwood brush. Although the majority of burns are conducted in the early growing season between mid-March and mid-May, summer burning from May to July is also preferred due to the more effective control of woody competition; however, this option is often constrained by air quality and smoke management issues. Growing season burns will be concentrated in longleaf pine communities and certain fire-dependent forest communities such as calcareous prairies, pitcher plant bogs, and red-cockaded woodpecker clusters. Burning objectives include eliminating woody understory, promoting herbaceous ground cover communities, controlling brown-spot in longleaf pine seedlings and reducing fuel loadings.

#### Managing Wildfire in Restored Sites

The anticipated fire behavior in restored sites would include low to moderate intensity fires; therefore most wildfires would be limited to a small size. Use of mechanized fire suppression equipment will be most efficient in the resulting light fuels. The use of natural and existing man-made fire breaks will be more effective, allowing for more tactical options and flexibility in determining the appropriate management response.

#### Long Term Fire Cost Reductions

The R-CAT spreadsheet was used to estimate anticipated cost savings from reduced wildfire management costs (Attachment B). However, the NFs in Texas burn so frequently that fuel loadings are low and therefore the wildfires are small and are suppressed quickly. The result is that our beneficial use figures are relatively low.

Though not included in the initial proposal, communities with Community Wildfire Protection Plans (CWPPs) exist on private lands associated with the proposed project. The CWPPs are expected to be included in future year treatments. As a result, we anticipate long-term wildfire management cost reductions. In particular, reduction of the potential for large or catastrophic wildfires through prescribed fire and reduction of hazardous fuels and re-establishment of natural fire regimes will reduce the costs associated with future large wildfires within treated areas. Costs of initial attack fires would be reduced due to:

- Increased success of initial attack in light fuels under light or moderate fire intensity;
- Reduced resistance to control; and
- Increased effectiveness of natural and existing man-made fire breaks.

## **Benefits to Wildlife**

The goals of this project are to restore the structure, composition, and function of the longleaf pine ecosystems that once characterized the historic landscape. By restoring the native species, natural communities, and historic fire regimes, species will continue to adapt and evolve through natural selection and ecosystems will improve in health and resilience. Species such as the federally listed endangered red-cockaded woodpecker, Louisiana pine snake and a host of rare herbaceous and woody vegetation will benefit from habitat improvement. Improved habitat will also benefit species of concern such as Bachman's sparrow, Swainson's warbler, Kentucky warbler, northern bob-white quail, brown-headed nuthatch and American woodcock. The Ridge also supports thriving populations of white-tail deer, wild turkey and small game.

## **Benefits to Water Quality**

Restoration and maintenance of longleaf pine communities and natural fire regimes will maintain healthy forests and reduce the risk of catastrophic fire, thereby protecting water quality and preventing loss of ecosystem components and personal property. In particular, longleaf pine communities contribute to stable watersheds. We will comply with the Clean Water Act by practicing good stewardship of the proposed treatment sites. For example, plans are underway to monitor surface water quality within longleaf pine communities in the project landscape. Additionally, the transportation system will be actively monitored to identify areas in need of rehabilitation. Roads that are found to contribute to soil loss, sedimentation and degradation of water quality are selected as candidates for rehabilitation or closure. Reduced sediment input from stable watersheds and a sustainable transportation system is expected to maintain and improve water quality and aquatic habitat for species such as the threatened Louisiana pearlshell mussel. The process of ecological restoration includes the prevention, remediation and control of non-native invasive plants through the introduction of natural ecological processes, such as fire, that benefit primarily native species. Unfortunately, some non-native plants, such as Cogon grass, actually compete better than most native species under established fire regimes. Cogon grass can be found near the project areas but it has not yet invaded. Although inspection and washing of equipment are stipulated in current contracts, future actions may require treatment of cogon grass should it become established in the project area.

## **Insects and Disease**

Among the various insects and diseases of concern within the project landscape, the southern pine beetle (SPB) poses a great risk to forest health. Trees were lost on 35,000 acres of NFS

lands during the SPB epidemic that peaked in Texas during the mid-1980s. A SPB outbreak in the early-1990s killed 20,000 acres of trees. The losses are of concern because three-fourths of the 346 red-cockaded woodpecker breeding groups in Texas are located in vulnerable, high-density, older-aged loblolly stands. Conversely, longleaf pine is highly resistant to SPB infestation and is the preferred host type for the woodpecker. Converting from loblolly to longleaf with the use of commercial timber sales and re-planting is an effective way to re-establish the original SPB-resistant ecosystem and the wildlife species that depend upon them. Non-native pests such as Sirex woodwasps would also impact off-site species more so than longleaf growing on longleaf pine sites.

***Collaboration and Multi-party Monitoring***

In 2010, the *Texas-Louisiana Longleaf Pine Taskforce* (<http://txlalongleaf.org/>) was formed to bring together longleaf pine advocates and practitioners. The *Texas-Louisiana Longleaf Pine Taskforce* is the dynamic collaborative partnership and the backbone to this CFLRP proposal to strengthen US Forest Service (USFS) efforts to accelerate longleaf restoration west of the Mississippi. The Taskforce directly supports the America’s Longleaf organization (<http://americaslongleaf.org>) that has developed a strategic plan with goals to increase longleaf pine acreage across the entire species range, including Texas and Louisiana. The two-state partnership is inclusive, connecting federal agencies, multiple state agencies, local governments, industry, and non-governmental organizations (Table 2). Many of the organizations have worked together on longleaf pine for several years (e.g., the Texas Nature Conservancy 1996 West Gulf Coastal Plain Conservation Initiative).

Table 2. Current longleaf pine partners working in Texas.

---

AgriLife Research & Extension	Stephen F. Austin State University
Big Thicket National Preserve	Texas Forest Service
Campbell Group Inc.	Texas Parks & Wildlife Department
Hancock Forest Management	The Conservation Fund
Institute of Renewable Natural Resources	The Nature Conservancy
Louisiana Dept. Of Ag. & Forestry	Trust for Public Lands
Louisiana Dept. of Wildlife & Fisheries	US Army Corps of Engineer
National Park Service	US Fish & Wildlife Service
National Wild Turkey Federation	USFS Forest Health Protection
National Resources Conservation Service	USFS National Forests & Grasslands in TX
Southern Company	USFS Southern Research Station

---

Some early successes of the partnership include (1) sharing of information via bi-monthly meetings and a new website, (2) shared GIS mapping, and (3) joint projects. For example, the Natural Resources Conservation Service (NRCS) and the Texas Forest Service established a NRCS Co-op Conservation Partnership Initiative for longleaf pine restoration. The partnership provides cost share assistance to landowners through the Environmental Quality Incentives Program's (EQIPs) stream of funds. Recently, NRCS announced the availability of more than \$12 million in EQIP funding to help private landowners restore and manage longleaf pine in nine southern states. In addition, NRCS provided Wildlife Habitat Incentives Program (WHIP) funding to help private landowners restore and manage longleaf pine in nine southern states. Of that amount Texas was awarded \$375,000 in FY2010 and \$575,000 for FY2011 in NRCS-administered WHIP funds for longleaf pine restoration on high-priority lands. Eligible practices under the WHIP initiative include firebreaks, site preparation, forest stand improvement, prescribed burning, and re-establishment of longleaf pine. For example, the Alabama-Coushatta Tribe of Texas enrolled upwards of 400 acres of suitable longleaf pine production land into the WHIP and longleaf pine will be reestablished on six different sites. Other examples of joint projects include large industrial landowners working with the state, federal and non-governmental agencies to develop and sign conservation easements that ensure retention of forest cover in perpetuity (e.g., 5,000 acres in 2010). The National Forests in Texas have agreements with adjoining landowners for cooperative prescribed burning to accomplish fuels reduction in the longleaf ecosystem. The kinds of agreements that are now in place will allow the return of fire to the longleaf ecosystem inside the Upland Island Wilderness in Texas for the first time in over 25 years. In addition, the extent of the aforementioned partnerships has the potential to restore connected longleaf pine communities across a vast landscape.

Stewardship agreements are another important tool used for collaboration. The NFs in Texas and the National Wild Turkey Federation (NWTf) have an agreement (No. 11-SA-11081301-003) for a landscape restoration project within the Longleaf Ridge Area of the Angelina NF. The long-term goals are to restore and enhance the longleaf pine ecosystem on NFS lands as well as private lands within the area. Through the agreement, the NFs in Texas will conduct prescribed burning on approximately 12,980 acres in the Upland Island Wilderness and on adjacent private lands within the Longleaf Ridge Ecosystem. In addition, Campbell Group Inc. and the NWTf will be restoring longleaf pine and wildlife habitat on approximately 444 acres on Campbell lands that are adjacent to the Angelina NF and are within the Longleaf Ridge Ecosystem.

### **Multi-party Monitoring**

The NFs in Texas have an existing partnership with Stephen F. Austin State University to monitor longleaf ecosystems inside the Upland Island Wilderness on the Angelina NF. In addition, the NFs in Texas have partnered with NRCS to develop local sources of native seed for

use in re-vegetation projects, which will help safeguard the native diversity of the longleaf pine ecosystem. Additional monitoring partnerships with local and regional educational institutions regarding rare species are in place such as the re-introduction of the Louisiana pine snake, re-establishment of the Kentucky lady's slipper orchid and the enormous amount of continuing work with the endangered red-cockaded woodpecker. *The Texas-Louisiana Longleaf Pine Taskforce* recognized the ecologic and economic values of the contributions of the partners at work in restoring longleaf pine in Texas and Louisiana and they have developed tools to capture and display that information. Currently the organization is compiling the information on a longleaf pine "Partner Contribution Matrix" and posting on the website for information sharing. Restored sites are essential for providing high-quality timber products and many other valued goods and services.

### **Monitoring Sites**

Monitoring plots will be established across treatments and data will be collected by NFS professionals to document overall impacts and effects on the ecological, social and economic environment. Monitoring data also will be used to establish that we are doing what we said we would do; to assess the effectiveness of treatment; and to revise the initial treatment plan as necessary.

### **Measuring Success**

At the most basic level, success will be measured in terms of the number of acres of longleaf pine ecosystems re-established, improved and maintained. Operationally, success criteria will be developed for priority management objectives and desired conditions for each ecological management area. Each treatment area will likely have unique criteria due to differences in potential ecological conditions and existing vegetation types. We acknowledge that long-term success can only be achieved through the maintenance of existing partnerships and the development of new ones and the cultivation of a wide-spread appreciation for the varied and complex cultural, social, economic, and ecological values of longleaf pine as we share our stories of success through formal and informal conservation education activities and programs.

### **Measures of Success**

1. Restored sites collectively perpetuate the full spectrum of biological diversity and ecosystem variability.
2. Restored ecosystems are resilient to periodic stress and disturbance and are capable of sustaining viable populations of key species.

3. Fire and other natural processes are functional and maintained within the normal range of variability.
4. Individual sites have appropriate composition and structure or are trending in the appropriate direction and invasive species are controlled.
5. Individual sites are integrated with adjacent land use to the fullest extent possible

### ***Utilization***

The forest sector generates major contributions to the local economies in both Texas and Louisiana, where wood-based industries continue to rank among the top-ten manufacturing sectors. For example, in the East Texas counties within the proposed project, wood-based industries were one of the top two largest manufacturing employees (Li and Carraway 2009). It is reasonable to assume that the markets associated with wood-based industries will remain stable or continue to increase for the foreseeable future, and, if so, that there will be a corresponding demand for biomass and small diameter trees.

Forest product types annually produced by the NFs in Texas typically average 62% sawtimber and 38% small round wood. Without CFLRP funding, the current annual value and extent of the forest products produced over ten years would be \$1,729,149 and 2,093 acres, respectively on four designated restoration projects. With CFLRP funding, nine additional restoration projects could be completed and the annual forest product value and extent could triple to \$5,436,567 and 6,582 acres, respectively.

### **Generation and Use of Biomass and Small Diameter Trees**

The proposed restoration treatments, including midstory and first thinning plantations, would involve the removal of small diameter trees (from 1" to 8" DBH), as well as tops, limbs and other debris. The majority of this material would likely be used as fuel in pulpwood mills.

### **Projected Demand and Value for Biomass**

In a recent report, the US Department of Energy, Office of Energy Efficiency and Renewable Energy projected demand for biofuels will increase 300% between 2010 and 2020. Recent interest in biofuels in Texas would seem to support this projection. For example, within the last 5 years, there has been more interest in utilizing woody biomass for energy production as a stand-alone facility. There is a newly established biomass facility in Texas and at least three more are scheduled for construction (Fig. 4). For example, Aspen Power LLC established a 50-megawatt power plant in Lufkin in 2010 and the plant currently employs 125 people. Over 200

employees will be newly hired In March, 2011 when the plant is fully operational. In addition, the plant is expected to add \$90 to \$100 million worth of assets to the community. The East Texas Electric Cooperative has plans under contract for a biomass facility in Woodville and the Southern Company is building a new biomass plant near Nacogdoches with power sales under contract with Austin, Texas. In addition, the Southern Company is a long standing partner with the USFS regarding longleaf pine and red-cockaded woodpecker management. Southern Power, a subsidiary of the Southern Company, has a new biomass facility in Sacul that will be fully operational next year. The facility in Sacul is expected to be one of the largest biomass plants in the United States.

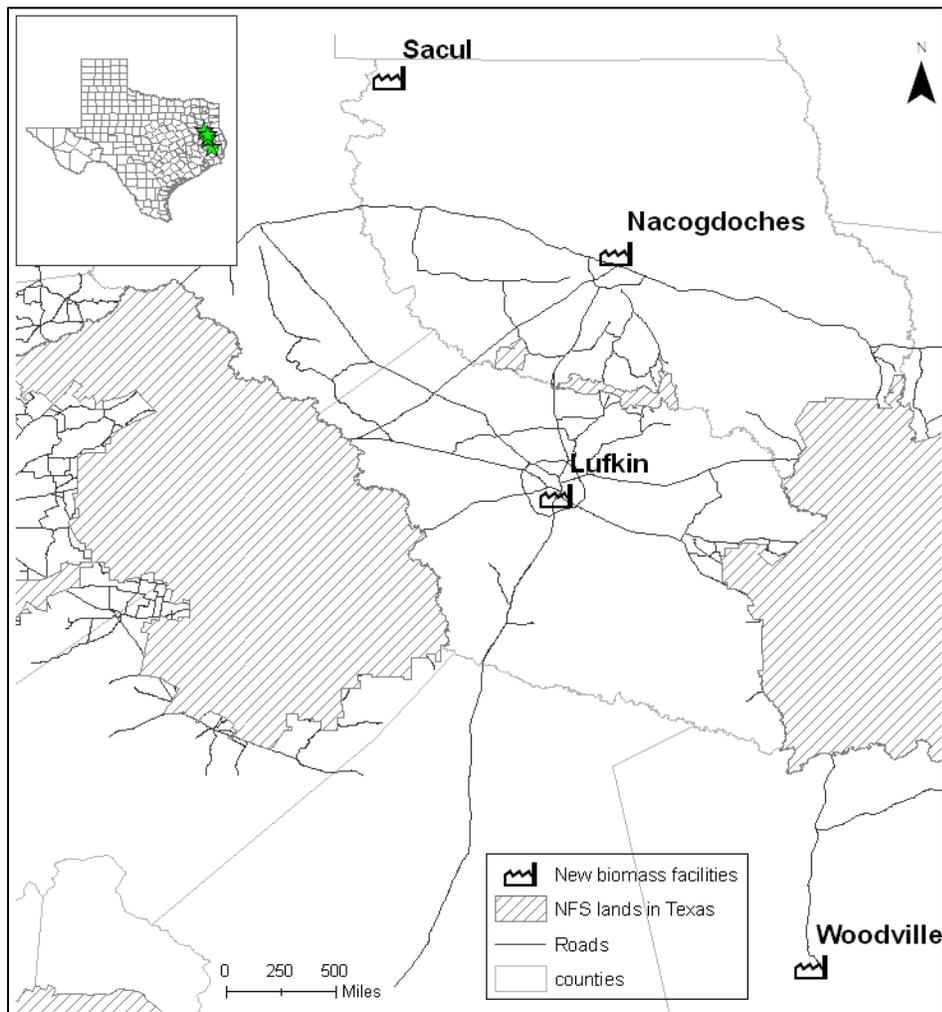


Figure 4. Locations of new biomass facilities near National Forest lands in Texas.

### ***Benefits to Local Economies***

The forestry, wood-products and related industries are major contributors to the economies and cultures of Texas. The estimated product value of materials removed in association with

restoration treatments over the length of this project is in excess of \$65,000,000. Conservatively, the project will generate over 300 full and part-time jobs (Li, 2010) and a host of training and volunteer opportunities. For example, the Aspen Power Plant in Lufkin currently employs 130 people and will hire 200 people this spring and the positions have an average salary of about \$50,000. In total, the proposed restoration projects will increase the Gross Regional Product by an estimated \$50,000,000 and increase payroll by over \$14,000,000 (Li 2010).

A total of 420 part- and full-time jobs will be created as a result of the project (Attachment E). Mechanisms used for restoration will include timber, service, stewardship, agreements, and force account. Jobs will be created in sawmills and pulp wood mills and also through contract labor.

In addition, the project benefits greatly from monetary, educational and “in-kind” investments from a wide range of federal and non-federal partners both within and outside of the local communities. Importantly, the project also promotes Conservation Education and creates training and employment opportunities for local communities. For example, the NFs in Texas promote interpretive exhibits such as the National Park Service’s longleaf pine presentation at the Big Thicket Preserve Visitor Center. In addition, the NFs in Texas sponsor several Conservation Education activities each year including:

- “Kids in the Woods”,
- “Wheeling Sportsmen”,
- “Forestry Awareness”;
- “4-H Achievement” days; and
- Career days and youth programs.

### ***Funding Plan***

The NFS lands in the southeastern United States offer unique opportunities for restoring the native forests and ecological systems that were once commonly found throughout the region. In many developed areas, the NFS lands are some of the few remaining large, forested landscapes in the South. Restoring and sustaining these lands and doing so in close coordination with our partners and neighboring landowners were a key part in the establishment of the Southern Region national forests and continue to be an emphasis in our management goals for today.

The CFLRP will supplement the Southern Region’s work priorities very well. The Southern Region has developed a Strategic Framework to guide the important work we do. This Strategic Framework has identified restoration as one of the main areas of emphasis for developing programs of work. The goal for this region-wide focus is “ecological systems are returned to their natural resilience and sustained,” which also supports intent of the CFLRP.

The Southern Region's program of restoration work includes a broad set of management practices designed to control the establishment, growth, composition, health, and quality of forests to meet the diverse needs and values of society on a sustainable basis. In developing our regional funding plans, the integration of multiple programs is the primary driver for budget development. Annual funding requests are made by each national forest based on their integrated capacity to accomplish needed work to support land management goals and objectives. The goals and objectives are guided by Land Management Plans, the Region's Strategic Framework, and other restoration strategies. Our regional program managers (fire, fuels, wildlife, forest health protection, vegetation, and watershed management) then work together to develop a seamless regional budget package that takes full advantage of the strengths of each individual program.

Vegetation treatment activities for restoration are designed to protect and restore ecosystems, address energy and other social needs, and protect human communities. The funding identified through the process above is used to plan, implement, and monitor the work activities to be accomplished in each fiscal year. The Southern Region will continue to utilize this process to inform allocation decisions in support of CFLRP requirements and to assure that CFLRP funding allocated in FY2011 and FY2012 will be used on this proposal in the year transferred. The Region has also committed to assuring that funding will be available to support the long-term multiparty monitoring requirement for this proposal. The Southern Region has a proven track record for delivering a very efficient program of work with high integrity for producing results.

## References

Brockway, Dale G.; Kenneth W. Outcalt, Donald J. Tomczak, and Everett E. Johnson. 2006 revised. *Restoration of Longleaf Pine Ecosystems*, General Technical Report SRS-83. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 34 pp.

Mohr, C. 1897. *Timber pines of the United States*, United States Department of Agriculture Division of Forestry, Bulletin 13.

Martin, D.L. and L. M. Smith. 1991. A survey and description of the natural plant communities of the Kisatchie National Forest. Louisiana Department of Wildlife and Fisheries. Baton Rouge, Louisiana, USA.

Li, Y. and B. Carraway. 2009. Economic Impact of the Texas Forest Sector, 2007. Texas Forest Service, Texas A&M University System, College Station, Texas.

Li, Y. 2010. Personal communication.