

2007

Five-Year Review and Recommendations

**National Forests and Grasslands in Texas
Revised Forest Land and Resource Management Plan**

September 2009

Needs Editing

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I. Introduction

The National Forests and Grasslands in Texas's (NFGT) Revised Forest Plan was signed in 1996, but an injunction was issued by Judge Schell on August 17, 1997 which prohibited the NFGT from engaging in timber harvesting under any method unless for insect or disease control, fire protection, or any other reason necessary to maintain the health of the forest land. The injunction was lifted by Judge Schell on July 25, 2003. This cleared the way for the NFGT to fully implement the provisions of the 1996 Revised Land and Resource Management Plan (the *Plan*) and to apply the standards and guidelines for managing Red-cockaded woodpecker habitat.

As stated in 36 CFR 219.10(g) (1982 Planning Regulations), the Forest Supervisor shall review the conditions on the land covered by the *Plan* at least every five years to determine whether conditions or demands of the public have changed significantly. Now, after five years of implementing the 1996 Revised Plan, this new *2007 Five-Year Review and Recommendations* report is being prepared. It differs somewhat in format from the 1990 5-Year Review, since it is for a Revised Plan instead of a new one

II. Area of Analysis

The area being analyzed in this report is the NFGT. The planning area consists of the Angelina, Davy Crockett, Sabine, and Sam Houston National Forests in east Texas, and the Caddo and Lyndon B. Johnson National Grasslands in north central Texas. There are approximately 675,808 National Forest acres in 12 counties. Approximately 38,100 acres of National Grasslands are located in 3 counties. The forests are within 2 hours driving distance of the Houston metropolitan area and within 4 hours driving distance of the Dallas-Fort Worth metropolitan area.

The Forest Supervisor's office located in Lufkin, Texas directs the management of these public lands. The forests have four ranger districts with offices in Milam, Zavalla, Ratcliff, and New Waverly, Texas. The Caddo and LBJ National Grasslands office is based in Decatur, Texas.



The 1996 Revised Forest Plan identifies the goals and objectives expected for the NFGT. It also allocates the land area to particular *management area* choices. Management areas are relatively large areas with unique locations having common management direction called management area *prescriptions*. Management area prescriptions are composed of specific activities or practices scheduled for application on the management area and designed to achieve stated objectives. Each prescription also has an associated set of standards and guidelines which provide rules, constraints, and the usual course of action needed to implement proposed activities. The management area prescription with its associated activities, practices, standards, and guidelines is the operational link in achieving the *desired future condition* (DFC) for a particular management area.

III. Management Review of Comprehensive Evaluation

A. Summary of Findings

1. Area of Analysis

The area being analyzed in this report is the NFGT. The planning area consists of the Angelina, Davy Crockett, Sabine, and Sam Houston National Forests in east Texas, and

the Caddo and Lyndon B. Johnson National Grasslands in north central Texas. There are approximately 675,808 National Forest acres in 12 counties. Approximately 38,100 acres of National Grasslands are located in 3 counties. The Forests are within 2 hours driving distance of the Houston metropolitan area and within 4 hours driving distance of the Dallas-Fort Worth metropolitan area.

The Forest Supervisor’s office located in Lufkin, Texas directs the management of these public lands. The Forests have four ranger districts with offices in Milam, Zavalla, Ratcliff, and New Waverly, Texas. The Caddo and LBJ National Grasslands office is based in Decatur, Texas.

2. Roles and Contributions

The National Forests and Grasslands in Texas are located in 12 counties in east Texas and 3 counties in north central Texas. Below is a breakdown of National Forest acres by county.

ACREAGE TOTALS BY FORESTS- BY COUNTIES

	<u>Angelina</u>	<u>Jasper</u>	<u>San Augustine</u>	<u>Nacogdoches</u>	<u>Total</u>	
Angelina	58,520.00	21,013.38	64,388.62	9,237.86	153,159.86	
	<u>Trinity</u>	<u>Houston</u>			<u>Total</u>	
Davy Crockett	67,313.14	93,319.42			160,632.56	
	<u>San Aug.</u>	<u>Sabine</u>	<u>Shelby</u>	<u>Jasper</u>	<u>Newton</u>	<u>Total</u>
Sabine	4,287.30	95,454.37	59,211.67	64.00	1,780.93	160,798.27
	<u>San Jac.</u>	<u>Walker</u>	<u>Montgomery</u>			<u>Total</u>
Sam Houston	60,632.39	54,597.06	47,800.83			<u>163,030.28</u>
TOTAL NATIONAL FORESTS IN TEXAS					637,620.97	

NATIONAL GRASSLANDS

<u>CADDO</u>	<u>Acres</u>
Fannin	17,873.58
<u>LBJ</u>	<u>Acres</u>
Montague	61.00
Wise	20,251.63
TOTAL GRASSLANDS	38,186.21

Acres on the NFGT changed slightly based on the disposal of work centers on the Davy Crockett, Sabine, and Sam Houston National Forests in 2006.

3. Ecological

a. Red-cockaded Woodpecker

There are 4 Red-Cockaded Woodpecker (RCW) Habitat Management Areas (HMAs) on the Forest. Each ranger district has one HMA that encompasses most of its forested land area. Populations of Red-Cockaded Woodpeckers on the forests are slightly increasing. Current management direction has been concentrated in the RCW HMAs. Management activities have been mainly thinning within mature sawtimber stands. These thinnings typically remove most of the mature loblolly trees and hardwoods, resulting in eventual restoration within these areas to longleaf and shortleaf pine.

The forest is making steady progress toward its 2003 USFWS RCW Recovery Plan goal of two primary core populations (Sam Houston and Angelina/Sabine RCW populations) and one secondary core population (Davy Crockett RCW population). National Forests in Texas's RCW population goals are: Sam Houston (goal = 350 active clusters, currently 178 active clusters), Angelina/Sabine (goal = 350 active clusters, currently 72 active clusters); and Davy Crockett (goal = 250 active clusters, currently 65 active clusters).

b. Management Indicator Species

Based on survey results of NFGT's point-count monitoring, stable population densities have been ascertained for Yellow-throated Vireo, Acadian Flycatcher, Wood Thrush, whitetailed deer, and gray/fox squirrel and possible increasing population densities have been ascertained for Eastern Wild Turkey, Red-cockaded Woodpecker, Pileated Woodpecker, and Yellow-breasted Chat.

The NFGT tracks 26 rare plants. Each plant species falls into one of two categories of rarity: sensitive plants (22 species) and four federally-threatened plants (earthfruit, Navasota ladies' tresses, white bladderpod, and Texas prairie dawn). New regulations restricting Off Highway Vehicle (OHV) use to authorized roads and trails should greatly reduce potential damage to rare plant habitat, particularly glades, barrens, and bogs.

c. Prescribed burning

Frequency and intensity of prescribed burning activities are slowly affecting changes in the vegetative communities found on the NFGT. Their uses, along with intermediate harvests (such as first thinning in 15-to-20 year old stands) have had significant influence on vegetative patterns and structure within the forested landscapes. In 1997, the NFGT employed prescribed fire on an average of 71,367 acres annually. Since the *Plan* was revised, the annual average has increased to 129,618 acres.

d. Non-native Invasive Plant Species

Non-native invasive species are surveyed on NFGT lands regularly, including project-specific walking surveys by botanists, and random driving surveys. Of these species, the NFGT is actively eradicating Japanese climbing fern, privet, Chinese tallow tree, chinaberry, English ivy, mimosa, trifoliate orange, and Johnson grass.

4. Social and Economic

a. Recreation and Scenery

The NFGT is the second largest supplier of public recreation lands in Texas. Currently, the NFGT maintains 31 recreation sites featuring 498 improved camping sites, 84 primitive camping sites, 17 boat launches, 5 swim sites, 11 group picnic shelters, 20 family picnic units, 1 overlook, 2 wildlife viewing sites, and more than 408 miles of trails.

The recently proposed Travel Management Rule would limit motorized travel to designated routes only. The NFGT has historically been an “open unless designated closed” forest for motorized vehicle use. The forest is in the process of determining those routes that will allow motorized use. There will be a shift of recreational OHV use from cross country to designated trail, which will continue to allow the recreational opportunity to continue, but in a more focused and controlled environment. As the forest moves to designated routes for motorized use, there will be a need for additional or better located trailheads for trails. The forest is currently evaluating the optimal location and number of these sites.

b. Heritage

The NFGT continued government-to-government relations with six federally recognized tribal nations. These include the Caddo Tribe of Oklahoma, the Coushatta Indian Tribe, Alabama-Coushatta, United Keetowah Band of Cherokee Indians, Choctaw Nation of Oklahoma, and the Tunica Biloxi Tribe.

Most of the inventory for heritage resources has been conducted in support of various timber activities, wildlife habitat improvement, land exchanges, road construction, and recreation development.

The NFGT has a large number of unevaluated sites that are in protected status. These sites should be evaluated and it is the current thought that the majority of these will prove to be ineligible and therefore removed from protective status. The NFGT also has a number of eligible sites that are not listed on the National Register of Historic Places (NRHP). Efforts should be made to complete the evaluation (working with the Tribes) of these sites and get them listed on the NRHP.

The NFGT has drafted a programmatic agreement with the Advisory Council on Historic Preservation and the Texas State Historic Preservation Officers and Tribes. One aspect of this agreement streamlines the reporting process for compliance with Section 106 of the National Historic Preservation Act. Under provisions of the programmatic agreement, some projects or project types can be categorically excluded from full review procedures. This means that the forest is able to schedule its heritage resource workforce to better concentrate accomplishments on higher-impact projects. This would be important in future efforts to fill in data gaps, especially in non-project related portions of the NFGT.

c. Forest Products

Demand for timber products is strong on the NFGT. Products such as poles are in high demand. The pulpwood market has remained stable to increasing in most of the area due to new oriented-strand board mills coming on line. The demand for plywood is down due to imports, but sawtimber still sells well.

Hurricane Rita that impacted Texas in 2005 had a dampening effect on the timber market. With so much timber on the ground in Mississippi, Louisiana, and Texas, most purchasers were trying to process as much of the damaged timber as possible before it became unusable. However, the purchase of green timber continued to remain strong through the period, and has since become stronger.

The sale of forest products on this forest has steadily increased from a low in FY2006 of 3.6 MMBF (million board feet of timber) to approximately 31.1 MMBF of forest products in FY2007. If current personnel levels remain the same, the NFGT could sell approximately 50 MMBF per year.

Despite the Revised Plan's allowance for more and larger clearcuts to restore native species, projects submitted by the districts have not included any large increase in the number or size of these units; they have actually decreased due to concentrating all harvesting inside the RCW HMA. This has limited the amount of fuelwood that can be offered. If the downward trend continues, there may be no more opportunities for designating fuelwood areas; gathering of fuelwood would be limited to the single down or dead trees found throughout the forests.

d. Grazing

Approximately 500 cattle graze on the Caddo/LBJ National Grasslands as authorized under 17 grazing permits. No grazing is allowed to exceed four months on any one allotment/unit.

e. Landownership

The climate is changing in landownership patterns in Texas. Many owners of large private tracts within the forest boundary had been nationally-based timber companies (International Paper, Temple Inland) who have recently decided to divest their land holdings to TIMOs (timberland investment management organizations) and REITs (real estate investment trusts). Forest neighbors who were once large timber companies with similar goals are now becoming subdivisions of private homes. The wildland-urban interface and its associated complexities are upon us. This is causing a new list of concerns such as increased encroachment, whether intentional or not. It makes many management tools more difficult to employ (like fire suppression and prescribed burning). Any reduction in budgeting for landline maintenance may have far-reaching effects. There are less-visible effects such as increased non-commercial traffic on Forest system roads and increased maintenance needs.

Each year the Forest administered between 800 and 900 Special Use Authorizations for roads, utilities, recreation events, recreation residences, and other uses. In addition, from 16 to 30 new authorizations were evaluated annually, with 19 to 29 granted/renewed each year. Annual recommendations have been to pursue prioritized land acquisitions and exchange program as funding allows. The Forest is exploring the use of Tripartite land

exchange using excess timber receipts to acquire land. We are presently preparing a list of possibilities for prioritization.

f. Access and Travel

About two-thirds of the total mileage is under Forest Service jurisdiction. While road densities vary from area to area, on average there are approximately 5.7 miles of road per square mile. Of this, the Forest Service has authority to control access on about 2.4 miles of road per square mile.

While budgets have continued to decline, there has been a significant increase in road maintenance costs in recent years. The demand for materials, equipment and labor has increased dramatically in Texas as a result of Hurricane Rita. There has also been a worldwide increase in the demand for construction and maintenance materials, resulting in increased costs of road maintenance.

Over the first five years of *Plan* implementation, off-road use increased at a higher rate than expected. Disturbances caused by OHV use created unacceptable damage to some areas, especially along existing trails, along stream channels, and within rare plant communities such as bogs. Also, the *Revised Land and Resource Management Plan, NFGT* (1996) would be amended to prohibit motorized use off the designated routes and areas on the entire NFGT and to reflect the changes consistent with the 2005 National Travel Management Rule. The decision would be implemented when the motor vehicle use map (MVUM) showing designated routes with type of motorized use is published and made available to the public. The designated roads for motorized travel will be indicated on the ground with a route marker that will match the road number on the MVUM. Seasonal roads will be signed identifying the type of vehicle and season of use dates. The MVUM is the law enforcement tool, and each forest visitor will be responsible for obtaining and complying with the MVUM.

g. Collaboration

Several partnerships were developed to increase the effectiveness of the botanical program. Partnerships were developed with The University of North Texas, Bog Research, San Jacinto River Authority, The Nature Conservancy, and Azimuth Forestry that resulted in several projects being completed. Among these were Challenge-Cost Share agreements to re-establish a native legume on the LBJ National Grassland (NG), to complete a floristic inventory of Fox Hunters Hill (a Texas Natural Heritage Area) on the Sabine NF, establishing a native plant materials production area on Clymer Meadow Preserve on the Caddo NG in partnership with The Nature Conservancy, and several smaller contracts that resulted in the completion of additional Threatened and Endangered Species survey work.

The Regional Zone Air Resource Specialist collaborated with TCEQ (Texas Commission on Environmental Quality) on a prescribed fire project on the Sam Houston NF to mitigate impacts to air quality in the metropolitan Houston ozone non-attainment area.

The NFGT is working in partnership with Texas Parks and Wildlife and Trails Unlimited (a Forest Service Enterprise Team) to examine areas of the NFGT having suitability for developed trails. The process will involve using GIS technology and existing

information on sensitive resources to filter out areas with numerous resources concerns and highlight areas with fewer concerns. District employee and Supervisor's Office specialist input will be used to further narrow the areas of potential trail systems noting areas close to rural towns that would benefit from a trail system, proximity to existing recreation and camping areas, and adequate size to merit consideration.

The NFGT works with various individuals and groups to further the awareness of our cultural heritage resources. The partnership with Lake Fannin Wilderness Park, Inc. has been successful at restoring this facility to some usefulness. That partnership continues to grow and prosper, and recently the group was issued a Granger-Thye permit to allow for continued management and improvements funded by receipts from the use of the complex.

Texas Friends of Project in Time (TFPIT) came into existence with the express purpose of providing labor and monetary support to the Forest's Passport in Time program. Passport in Time is a volunteer initiative which allows amateur and avocational archeologists to work alongside archeological and historic preservation professionals in the Forest Service on projects which are beneficial and critical to the successful management of heritage resources. TFPIT has contributed funds to support analyses that could not be possible if the NFGT were to rely on appropriated dollars. In addition, they have provided some financial support to the purchase of equipment for Lake Fannin. Since 2002, PIT volunteers have contributed in excess of 10,000 hours of time towards historic preservation programs on the NFGT.

The NFGT continues to have a healthy and productive partnership with the Lake Fannin Wilderness Park volunteer group. Based in Fannin County, this group is providing invaluable assistance in the stabilization and restoration of the Lake Fannin Organizational Camp, a listed National Register of Historic Places property on the Caddo NG in Fannin County, Texas. To date, five cabins have been completely stabilized. The lodge and caretaker's residence have been restored and refurbished so that they are functional buildings – there is a caretaker living in the residence, and the lodge has hosted numerous events in the last three years. The latrine and bathhouse have experienced some stabilization, but more work remains to be done on them before they too can become completely functional again. A Granger-Thye permit for operation and maintenance has been issued to the Lake Fannin Wilderness Park group, and their future involvement in the maintenance and management of Lake Fannin seems assured.

Heritage Resource management staff have been active participants in local, state, and national efforts to promote historic preservation and cultural resource management. Numerous presentations to civic clubs and school groups have increased public awareness of heritage resource management issues. Staff members have made numerous professional presentations to local and regional archeological societies, as well as at national and international level symposia.

The NFGT works in collaboration with the following organizations, universities, and agencies on various recreation and forest management issues:

National Wild Turkey Federation (NWTf)
Texas Parks and Wildlife Department (TPWD)

Lake Fannin Wilderness Parks of Texas, Inc.
Natural Resources Conservation Service (NRCS)

Fannin Soil & Water Conservation District
Caddo Trail Riders
Texas Arabian Distance Riders Association
(TADRA)
Friends of the Grasslands
Lake Fannin Wilderness Park, Inc.
Wise County Soil & Water Conservation District
Houston Chapter of the Sierra Club
Texas Conservation Alliance
Blue Ribbon Coalition
Greater Houston Off-Road Biking Association
Lone Star Hiking Trail Club
The Nature Conservancy
Texas Forest Service
Texas A & M
Boy Scouts of America
Audubon Society

San Jacinto River Authority
Trails Unlimited Enterprise Unit
Gulf Coast Trade Center
Sam Houston State University
Stephen F Austin State University (SFA)
U.S. Fish and Wildlife Service (USFWS)
Stephen F Austin University
Angelina College
Friends of the National Forests and Grasslands in
Texas
Angelina Forest Trail Riders
Dallas Off-Road Bicycle Association
Golden Triangle Chapter, Sierra Club
Lone Star Chapter, Sierra Club
International Mountain Biking Association
Texas Motorized Trails Coalition
Trail Riders of Houston

5. New Information

For this Five-Year Review of the Revised *Plan*, significant issues addressed in the Revision were re-examined. Ranger District and Supervisor's Office personnel were consulted and correspondence was reviewed. Project-level scoping notice and 30-day public comment period responses were also reviewed. Section VI of this report reviews each of the Revised Plan issues, examines their current status, and identifies issues and concerns that have been raised since Forest Plan Revision implementation

6. Evaluation of Need to Change Existing Direction

The 1996 Revised *Plan* allocated land and assigned management direction to 11 Management Areas(MA). No changes were needed to the Desired Future Conditions (DFCs) for the MAs after five years of *Plan* implementation.

Two amendments reallocated land from MA-1 (General Forest) and MA-4 (Streamside Management Zones) to MA-10a (Administrative Use Sites). Both amendments were for the Sabine NF and involved adding land to MA-10a for construction of the new Sabine Ranger District office. The office has been completed and occupancy began in 2007.

The forestwide goals and the MA goals are still appropriate and have not been altered in the first five years of the Revised *Plan*'s implementation.

Other minor changes in land suitability have occurred through less significant changes, but are too small to accurately measure as a whole. For example, some changes occur as newly identified RCW clusters are found; these areas, containing the cluster site (usually less than 10 acres), if in a timber-suitable area, can no longer be considered suitable. Also, as new trails are designated and old ones are eliminated, the acreage in trails may change; this could move these trail corridors into or out of a timber-suitable land classification.

Plan Amendment #7, the *Recovery Plan Amendment* was signed in October 2005 and made changes to incorporate new direction from the updated USFWS RCW Recovery Plan guidance.

Analysis was initiated on the travel management rule in 2006-2007. Forest Plan Amendment # 9 (*NFGT Travel Management Project*) was signed in January 2008. This amendment eliminated motorized cross-country travel forestwide to comply with the 2005 National Travel Management Rule. The proposal includes changes to the designations of authorized system routes and areas under NFGT jurisdiction.

Almost as soon as implementation of the Revised *Plan* began (January 2000), national and regional changes in budget planning and accounting began. Many of the assumptions used in developing the estimated annual budgets under the Revised *Plan* began to lose relevance, making true comparison difficult. Some of the changes that affected comparisons, along with the charts comparing budgets, are described in Section V of this report.

Another item of concern in implementation of the *Plan* direction has been an inconsistency in developing tactical plans for each of the ranger districts. In the past, a 10-year “Order of Entry” was developed to help plan site-level stand examinations and provide a level flow of timber output and road work. This order of entry was tied primarily to timber sale planning. In the Revised *Plan*, an ecosystems management approach was taken, with forestwide emphasis placed predominately on maintaining/enhancing RCW habitat and restoring native plant communities. Because each district plays a slightly different role in meeting the overall forestwide objectives, each district needs its own tactical plan of work for the 10-year *Plan* period. Direction on how to accomplish this is not clear on all districts and has been recognized as a necessary implementation tool. Forthcoming direction would most appropriately come in the form of training and/or Forest Supervisor letter(s) of direction.

7. Science Consistency

In the preparation of this Five-Year Review of the Revised Forest *Plan*, best available science was used to update some of the information provided in the 1996 Revised *Plan*. Section VIII of this report lists some ways best available science was used to provide quality information for preparing this document.

8. Risk and Uncertainty

The management direction (goals, objectives, DFCs, standards and guidelines) in the Revised *Plan* makes the basic assumption that our desired outcomes will remain “desirable” for at least a decade, and that any unplanned natural or man-made events will be at a scale small enough to not be a significant threat to achieving the planned objectives. The NFGT relies predominately on its annual monitoring reporting to assess changing conditions and new risks as they develop, and to adapt management direction as necessary to reach the *Plan*’s desired outcomes.

B. Need for Change Determination

1. Introduction

The National Forest and Grasslands in Texas (NFGT) has completed the Five-Year Review of the 1996 Revised Land and Resource Management Plan (Revised Forest *Plan*). This document provides some relevant information on current activities associated with the NFGT, and addresses key topics or considerations related to potential amendments or a revision of the *Plan*. Finally, this document provides the Forest Supervisor's overall determination relative to the Five-Year Review.

2. Approach Used to Conduct Five-Year Review

Direction or guidance to conduct the Five-Year Review came from the regulations found at 36 CFR 219.10 (g) (1982 Planning regulations), which states, "*The Forest Supervisor shall review the conditions on the land covered by the plan at least every five years to determine whether conditions or demands of the public have changed significantly.*"

The Revised Forest Plan was completed in 1996. The Five-Year Review addresses concerns that have accumulated since 1996 regarding the Forest Plan and its interpretations and applications. Also, it summarizes the monitoring work done on the NFGT during FY2003 through FY2007 and evaluates the existing condition and trends and factors that affected or may affect these trends.

The NFGT identified a number of potential issues or concerns related to the *Plan* by assessing information provided by Forest Service employees, as well as information provided by the public, as part of past and ongoing *Plan* and project-related public involvement efforts. Many of the potential concerns were related to policy and procedures for implementing the *Plan*. Other potential concerns could lead to a *Plan* amendment or revision. The most relevant issues of this latter group are discussed in this document, including key factors related to the conditions on the land.

3. Potential Change Agents

This section briefly describes current activities or programs that potentially affect conditions on the land relevant to the NFGT and the Revised Forest Plan.

Visual Quality Objectives

Finding(s) – Due to current and anticipated future budget reductions, in FY 06 the NFGT reorganized and the decision was made to eliminate the Landscape Architect position. The *Plan* contains direction for VQO instead of the more current SMS which is tied to GIS. In order to have the most current information SMS should be used. This may require a non-significant Forest Plan amendment.

Off-Road Vehicle Use

Finding(s) - During FY 06, the NFGT started the process to implement the Travel Management Rule (TMR) regulations (36 CFR Parts 212, 251, 261, and 295). The TMR was finalized and published on November 9, 2005 (70 FR 68264). This regulation recognizes OHVs as a legitimate use of the National Forest System lands, but requires that OHV use be carefully managed. The TMR restricts the use of motorized vehicles to designated roads, trails, and areas. The Rule requires the designations be made at the local level, with public involvement, in order to continue to provide the citizens of the country with the use and enjoyment of these public lands, while protecting the important environmental resources, services, values and uses of these public lands.

The TMR requires that each unit of the NFGT (the Sam Houston, Davy Crockett, Sabine, and Angelina NFs as well as the Caddo/LBJ National Grasslands) determine which roads, trails, and areas would be open for motorized vehicle use in a separate process and publish a Motor Vehicle Use Map (MVUM) designating those roads, trails and areas open for motorized vehicle use on each unit. Amendment # 9 was signed on January 4, 2008 which implemented the TMR. MVUM maps have been produced for each unit and distributed to Forest users.

Continue to monitor the road and trail system on the NFGT. Update MVUM maps annually each January.

Land Ownership Adjustments

a. Acquired Right-of-Ways

Finding(s) – One very important right-of-way case was resolved in FY 06 through civil litigation. A final judgment was issued in U.S. District Court in Houston, TX in the USA v. Colson matter. The judgment in favor of the government’s favor preserves necessary access to a section of public land on the Sam Houston NF. This is an important right-of-way acquisition case because it represents one of a few prescriptive easement cases decided by a jury trial in the nation. More details about this case can be found in the litigation section of this report.

No change needed. Continue to monitor and take actions to hold and secure public access. Address possible new right-of-way needs as projects develop.

b. Land Exchanges, Acquisitions, Interchanges, and Donations

Finding(s) – The primary focus for the Lands Program in FY 06 was a Land Sale Disposal under the FY 06 National Pilot Conveyance Authority. This was authorized through legislated authority titled the “Texas National Forest Improvement Act of 2000.” This legislation will allow for the conveyance of four administrative work centers to individual or corporate purchasers. The preliminary work for these lands sales occurred in FY 06 and is expected to be finalized and reported in FY 07. The conveyance and sale of these work centers may show a minimal boundary line increase instead of a net

boundary line reduction. However, the overall benefit to the NFGT consolidation efforts is the reduction of facility deferred maintenance and office leasing expenditures.

Change needed. Focus on acquisitions by implementing Tripartite Land Exchanges that use timber sale receipts to purchase land inholdings. This will help consolidate national forest lands, improve management and reduce boundary line maintenance. In FY 07, the NFGT will initiate the revision of the landownership adjustment and composite/project maps.

Human Influences

a. Law Enforcement

Finding(s) - Activities and conditions presented in the last report remained consistent in FY 06. There is a constant rise in use of NFGT lands that are near large urban areas (such as Dallas, Fort Worth and Houston.) The Sam Houston NF, near Houston, experienced increased use by OHVs - specifically all-terrain vehicles (ATVs) - from people living in nearby subdivisions. This created unauthorized trails and associated resource damage on the forest. Due to this increase of violations (and as identified as a need in the FY 05 M&E Report), one additional LEO (Law Enforcement Officer) was added and assigned to the Sam Houston NF.

Law Enforcement Officers are still encountering an increased amount of controlled substance use activity on the NFGT. An increase in numbers of arrests and search warrants reflects more illegal drug activity and better enforcement of the drug laws.

Change needed. In FY 07, pursue funding to hire additional law enforcement personnel (specifically for the Angelina NF) to help deal with increased OHV use, illegal drug issues, trash dumping and other illegal uses on NFGT lands.

Timber

a. Timber Sale Allowable Sale Quantity

Finding(s) – Total volume offered in FY 06 increased above FY 05 offerings due to Hurricane Rita Restoration Timber Sales. Regular program sales were deferred to a later date in order to expedite salvage operations. The NFGT is still continuing to recover from court orders which prohibited timber harvesting and is therefore not meeting necessary habitat, forest health, age-class distribution and restoration objectives

For the last ten years, an average of 14.6 percent of the *Plan* specified ASQ has been sold. Since the probability of exceeding ASQ is unlikely, this is not a real issue for the NFGT.

Change needed. Identify areas of concern and develop associated project plans to build up the timber harvesting program in order to meet *Plan* target levels. This will help the

NFGT move toward meeting its *Plan* management objectives for habitat improvement, forest health, age-class distribution and restoration needs.

Summary of Forest Plan Amendments

Amendment #1 (2000) to the Plan came about as a result of the Record of Decision for the Texas Blowdown Reforestation Project on the Angelina and Sabine NFs. In February 1998, a severe windstorm swept across east Texas damaging 103,000 acres on these two forests. The EIS provides for reforestation of the windstorm-damaged areas of the Angelina and Sabine NFs.

Amendment # 2 was signed March 14, 2001. This amendment for the Tannehil/Bishop Land exchange made land allocation decisions for the newly acquired non-Federal lands.

Amendment # 3 was not used due to a numbering problem.

Amendment # 4 (September 2002) to the *Plan* came about as a result of the ROD for the Supplement to the Final Environmental Impact Statement, Vegetation Management in the Coastal Plain/Piedmont (October 2002). This amendment provided clarification of direction for the preparation of site-specific Biological Evaluations (BEs) including inventory requirements for Proposed, Endangered, Threatened, and Sensitive (PETS) species for the NFGT. The Amendment was challenged in court and was later vacated on September 30, 2005.

Amendment # 5 (2004) was for the Alpine Project – Compartments 75 & 80 on the Sabine NF. This amendment included land reallocation from MA-1 (Upland Forest Ecosystems) to MA-10a (Administrative Use Sites).

Amendment # 6 (2002) was for new construction of the Sabine NF office and work center complex construction and land reallocation. This amendment included land reallocation from MA-1 (Upland Forest Ecosystems) and MA- 4 (Streamside Management Zones) to MA-10a (Administrative Use Sites).

In April 2006, Amendment # 7 was signed which incorporated direction from the Revised Red-cockaded Woodpecker Recovery Plan in the NFGT *Plan*.

Amendment # 8 (2006) was for the Angelina Motorized Trail Project. This decision was vacated and has not been implemented.

Implementation of the Forest Plan

Some intervening events between 2003 and 2007 either prominently affected or could potentially affect the implementation of the Forest Plan:

- In April of 2003, former Forest Service (FS) Chief Dale Bosworth described his concept of the *Four Threats to the Health of the Nation's Forests and Grasslands*.

The *USDA Forest Service Strategic Plan for Fiscal Years 2004-2008* provided a new framework for accomplishing the agency's mission and incorporated actions to resolve the Four Threats. Forest Service leadership, through the implementation of the Strategic Plan, became committed to removing the Four Threats from the national landscape.

- Previous FS Chief Abigail R. Kimbell re-enforced the national commitment to reducing the Four Treats with the USDA Forest Service Strategic Plan FY2007–2012 issued in July 2007. The national strategic goals and objectives for fiscal years 2007–2012 are:
 1. Restore, sustain, and enhance the Nation's forests and grasslands.
 2. Provide and sustain benefits to the American People.
 3. Conserve Open Space.
 4. Sustain and Enhance Outdoor Recreation Opportunities.
 5. Maintain Basic Management Capabilities of the Forest Service.
 6. Engage Urban America with Forest Service Programs.
 7. Provide Science-Based Applications and Tools for Sustainable Natural Resources Management.

Subjects Potentially Related to Forest Plan Amendment or Revision

The following sections describe subjects that are most often discussed in terms of potential reasons to amend or revise the *Plan*. Section VI of the Five-Year Review lists many other less prominent issues that could potentially initiate a Plan amendment if not resolved by other means (site-specific direction, change in administrative procedures, etc.).

1. Management Indicator Species

The Forest Plan identified 18 wildlife, 8 fish, 2 guilds, 9 communities, and 1 habitat element as management indicators (MI) to represent other wildlife species in a variety of habitats across the forest. These MI species are listed in Appendix G of the *Plan*. The *Plan* identified monitoring strategies for each of these MI. Forest Resource Specialists have been monitoring the MI and assessing their suitability as representatives of their specific habitat type. The NFGT is currently considering developing a Forest Plan Amendment to refine the list of MI being monitored.

2. Off-road Use

In the past, the NFGT has been open to motor vehicles. Following the policy of “open unless posted closed”, most logging roads have remained open to motorized public use. Motorized recreation trails have been designated for trail riding, but there were no restrictions or prohibitions for off-road or off-trail motorized use except in developed recreation areas, military use areas, wilderness areas, special interest areas, and other areas posted “closed”.

3. Biological Diversity

a. Red-cockaded Woodpecker

RCW populations on the forests are slowly increasing. The Sam Houston NF was removed from donor status in 2005 because of concerns about the population being stable or decreasing. The SHNF has been working toward improving its RCW habitat to return to donor status as quickly as possible. This has included thinning, burning, midstory treatments and artificial cavity installation.

4. Prescribed Burning

Internally there is a concern that in order to meet long-term desired future condition needs, the acreage objectives in the Revised Plan may need to be reexamined (increased) along with the percentage of the program conducted during the growing season. An amendment, if needed, is not expected to be significant, nor require a revision of the *Plan*.

Determination

Based on the Five-Year Review and implementation of the *Plan* to date, and as summarized above, I have determined that conditions on the land and demands of the public have not changed significantly since 1996. Accordingly, the *Plan* does not need to be revised at this time. However, the Five-Year Review identified potential items of work that could lead to minor adjustments or amendments to the *Plan*. These work items will be addressed as we continue to implement and monitor the *Plan*, and evaluate the results to determine whether adjustments need to be made to keep the *Plan* current.


LINDA BRETT
Forest Supervisor


Date

IV. Comprehensive Evaluation

A. Ecological

1. Vegetative Communities

a. Existing Conditions and Trends

1. Landscape Communities

The National Forests and Grasslands in Texas (NFGT) is composed of four national forests that are located in eastern Texas (Angelina, Davy Crockett, Sabine, and Sam Houston), and two national grasslands located in northern Texas (Caddo and Lyndon B. Johnson). The landscape communities were classified into four major community types, plus three minor communities. The minor communities are smaller-scale plant communities surrounded by the larger pine forests, such as streamside communities, which were identified as important forest types in the *Plan*. The vegetative communities and inclusional series are displayed in Table 1 (series are based on nomenclature developed by Allard 1990). The inclusional series are small-scale plant communities, such as hillside bogs, that are embedded within the larger landscape communities. The major and minor community types are described briefly below.

Tallgrass Prairie

Both the Lyndon B. Johnson (LBJ) National Grassland and Caddo National Grassland (NG) lie within this community type. The surface geology of this environmental zone consists of weathered sandstones and shales. Differential erosion has produced rolling and hilly topography, and the landscape becomes more rugged and broken to the west. In many upland areas, overgrazing and cultivation prior to the Dust Bowl days of the 1930s have led to severe erosion and siltation. Accordingly, many portions of low lying floodplains also have a mantle of recent (post-1850) alluvium.

Savanna vegetation is more characteristic of the western area or LBJ, while a mixed savanna and forest are more characteristic of the Caddo NG further to the east. Woody species occupy approximately 30 to 45 percent of the area of the national grasslands. The composition of the woody vegetation of the tallgrass prairie communities, in general, consists of 63 percent post oak and 29 percent blackjack oak, with 8 percent consisting of ten other species (primarily cedar, elm, and hackberry).

Little bluestem (mid-grass) is the dominant grass in these communities, co-associated with big bluestem and Indiangrass (tall grasses). The Ladonia unit of the Caddo NG, as well as a small portion of the LBJ falls within the Blackland or true Tallgrass Prairie. The soils of the Blackland Prairie are mostly dark calcareous clays derived from the underlying clay, marl, shale, chalky limestone, and other bedrock. Low permeability of Blackland clay soils has inhibited tree growth, except along the many stream courses.

Table 1. Vegetative Communities.

Grassland Communities	Dominant Series	Inclusional Series
Tallgrass Prairie	Little Bluestem – Indiangrass	
		Post Oak - Blackjack Oak/Black Hickory
		Texas Oak
		Ashe’s Juniper - Oak
Forest Communities	Dominant Series	Inclusional Series
Loblolly Pine	Loblolly Pine – Oak & Shortleaf Pine – Oak	
		Gammagrass - Switchgrass
		Sweetbay - Magnolia
		American Beech - White Oak
Shortleaf Pine	Shortleaf Pine – Oak	
		Bluejack Oak - Pine
		Sweetbay - Magnolia
		Loblolly Pine - Oak
Longleaf Pine	Longleaf Pine – Little Bluestem	
		Sphagnum - Beakrush
		Little Bluestem - Nuttall’s Goldenrod
		Shortleaf Pine - Oak
		Loblolly Pine - Oak
Minor Community in Longleaf Pine		
Bay – Shrub Wetland		Sweetbay - Magnolia
Minor Communities in Forest Communities		
Mesic Hardwood	Beech – Magnolia/White Oak	

Table 1. Vegetative Communities (cont').

		Loblolly - Oak
Bottomlands & Streamsides		
	Bald Cypress – Tupelo	
	Overcup Oak	
	Water Oak – Willow Oak	
	Swamp Chestnut Oak – Willow Oak	
	Pecan – Sugarberry	

Loblolly Pine

Loblolly pine is generally found in stands with various mixtures of hardwoods with thick understory growth; some areas have a significant component of shortleaf pine. Much of the historical loblolly pine region is associated with the traditional “Big Thicket” of east Texas. This broad, loblolly region is found in the southwestern Gulf Coastal Plain subsection. Loblolly pine trees can thrive on a variety of sites, but better growth is most often associated with better soils. Loblolly pine will frequently be found in both longleaf and shortleaf communities, but historically it was generally restricted to mesic sites, and slopes and terraces associated with streams.

Loblolly pine communities are less fire-adapted than the longleaf and shortleaf pine community types. Windstorms, including re-occurring hurricane events in the southwestern Gulf Coastal Plain subsection, and southern pine beetle (SPB) outbreaks are historical large-scale disturbances in the loblolly pine community.

Shortleaf Pine

This group was the largest natural timber belt in east Texas. It occurs north of both the longleaf and mixed hardwood-loblolly regions. Uplands in this area were typically open, scattered shortleaf pines, associated with both oaks and hickories. Various shrubs and regenerating overstory species may be located in the midstory and understory, especially in areas where fire has been suppressed. Herbaceous ground cover in upland sites has been reduced in some areas due to lack of fire. Natural herbaceous species will become more common when frequent burning regimes are applied. This community type also occurs as a shortleaf pine-oak-hickory inclusional community within the longleaf pine belt on finer textured soils.

The *Plan* directs that most forested stands on sandy soils in the Sparta Sandhills, Crockett Clay Hills, Redlands, and the Lignitic Uplands Landtype Associations (LTAs) on the northern Sabine and Davy Crockett NFs are to be restored to shortleaf pine. Generally, existing longleaf and shortleaf pine stands are to be maintained within these LTAs.

Longleaf Pine

Communities in this habitat group generally occur east of the Trinity River and extend eastward to the Sabine River and into Louisiana. Some isolated sites occur west of the Trinity River. The best examples of this group are typically found on deep, sandy soils.

Longleaf stands that have been burned frequently are characterized by an understory dominated by bluestem grasses and an overstory of longleaf pine. Unburned stands tend to lose the grassy herbaceous layer through shrub and hardwood invasion. Shortleaf and loblolly pine also tend to increase in these stands with a low fire frequency.

The *Plan* directs that most forest stands on deep sandy soils in the Mayflower Uplands, Deep Sandy Uplands, and Clayey Uplands Landtype Associations on the southern and central Angelina, Sabine, and Davy Crockett NFs are to be restored to longleaf pine. Existing longleaf pine stands are to be maintained wherever they occur.

Bay – Shrub Wetland

The bay-shrub wetland is considered an inclusion within the longleaf pine-little bluestem system. These wetlands or “baygalls” are generally identified as the Sweetbay-Magnolia series. These wet sites or wet lands will normally not be harvested. Some prescriptions require selective cutting to maintain the diversity of this community or allow development of the wetland into a hillside bog or Sphagnum-Beakrush series. The hillside bog, through natural succession (lack of fire or other disturbance) will develop the woody composition more typical of the bay-shrub wetland.

Mesic Hardwood

These forests occur primarily on slopes adjacent to stream bottoms or large river terraces. Although not always present, the most distinctive feature of the vegetation is the presence of American beech. This species reaches the western limits of its distribution near the Sam Houston National Forest (NF) and is limited or nonexistent on the Davy Crockett NF or western portion of the Sam Houston NF. This broad community seems to vary along an east-west gradient on national forest sites, with the most species-rich example found near the Sabine River in the Mill Creek Cove Research Natural Area.

These forests develop a closed canopy, with multiple canopies and open forest floor appearance. Communities with American beech (and southern magnolia) are often considered the classic “climax” plant community of the southeast. It has been suggested that these communities are relicts from Pleistocene glaciation.

Disturbance of late successional examples of this forest type tend to reiterate succession, while moderate disturbance of young stands may actually speed succession towards climax. Species found in this group are considered fire tender and it is unlikely that the community can develop under a prescribed fire program. Where these habitats occur adjacent to communities (like longleaf pine) an ecotone of variable width will occur.

Occasional fire episodes enter these habitats, but the landscape position and fuel composition suggest that few natural fires originate within these communities.

Bottomlands and Streamsides

These communities occur along streams ranging from constantly wet sloughs and backswamps to infrequently flooded storm-related floodplains. With the exception of bald cypress swamps, each community type is composed primarily of deciduous hardwoods. The particular species assemblage on a given site is highly dependent on local topographic factors, and even small-scale changes can produce important species changes.

Periodic flood events are probably the most important natural disturbance which operates in these communities, with heavy winds also playing an important role. Natural fires are of rare occurrence and generally play little role in community dynamics in these types. As in the mesic hardwood type (described above), occasional fires may enter these communities from more upland topographic positions, but moisture and fuel characteristics are typically sufficient to limit flame spread.

These streamside communities, though very different between the national grasslands and the four national forests, provide similar habitat, structure and riparian corridors for a myriad of other plant and animal species. Forest streamside communities have very different species composition as compared to those that occur on the national grasslands. The forest streamsides are commonly bottomland hardwood communities consisting of water oak, willow oak, swamp chestnut oak, and bald cypress, and have larger areas adjacent to the water.

The *Plan* designates certain riparian areas as Special Bottomland Areas (Management Area 8e) to greatly expand potential habitat for species like the Louisiana black bear and canebrake rattlesnake. The MA-8e areas are located on the Angelina and Sabine National Forests. The MA-8e riparian zones link the Angelina River and Neches River corridors with adjacent national forest lands and wilderness (such as Turkey Hill) through establishment of the Bear Creek, Ayish Bayou, Attoyac Bayou, and Upper Angelina River special management areas. The Longleaf Ridge Special Area (MA-6) provides for the development of a landscape with a number of special bottomland communities recognized as special management zones. The MA-6 riparian areas are designed to develop with structure and dead/down woody material not found within any other portions of the four national forests.

Very little understory will be present in the bottomland and streamside communities due to frequent flooding and shade.

Annual Monitoring and Evaluation Reports

Previous annual monitoring and evaluation reports discussed three key *Biodiversity* issues affecting vegetative communities under the topics: (1) regeneration of desired tree species (longleaf pine and shortleaf pine), (2) seral stage distribution (based on ten-year age classes), and (3) prescribed burning. In addition, the 2006 Annual Monitoring and

Evaluation (M&E) report contained trend information in *Biodiversity* on six forest community types: loblolly pine, shortleaf pine, longleaf pine, bay-shrub wetland, mesic hardwood, and bottomlands/streambanks. For consistency, these four areas are reported below.

Regeneration of Desired Tree Species

Table 2.

% survival of desired tree species

Regeneration	2003	2004	2005	2006	2007
First Year	---	93%	93%	56%	62%
Third Year	96%	78%	72%	53%	56%

Seral Stage Distribution

Table 3.

Successional Stage	Age Class	1992	2003	2004	2005*	2006	2007	Trend
Early	0-20 Years	22%	14%	13%	n.d.	11%	10%	- 12%
Mid	21-50 Years	11%	15%	15%	n.d.	17%	17%	+ 6%
Late	51-90 Years	61%	55%	53%	n.d.	50%	49%	- 12%
Very Late	> 91 Years	6%	16%	18%	n.d.	22%	24%	+18%

*n.d. – No data available for Fiscal Year 2005

Table 4. Prescribed Fire – Acres Burned Annually

FY	Fuel Reduction	Brownsport Control (Longleaf)	Site Prep for Regeneration	Control of Understory	Range Improvement	T&E*	Other Wildlife	Total
1997	38,454	397	196	4,353	883	5,501	21,583	71,367
1998	29,742	0	538	0	0	363	6,166	36,809
1999	52,937	667	174	2,681	500	5,531	24,640	87,130
2000	21,408	0	98	690	0	2,746	11,424	36,366
2001	40,656	80	92	563	0	3,535	14,230	59,156
2002	50,926	0	704	2,893	0	16,726	4,796	76,045
2003	23,750	0	1,472	0	0	4,360	1,400	30,982
2004	89,392	219	0	1477	0	31,722	4,401	127,211
2005	87,720	0	133	0	0	12,872	65	100,790
2006	95,770	0	479	0	0	435	0	96,684
2007	110,219	0	856	0	0	15,808	2,735	129,618

*Threatened and Endangered

Forest Community Types

Table 5.

Forest Community Type	1992	2003	2004	2005*	2006	2007	Trend
Loblolly Pine	58.6%	58.3%	58.4%	n.d.	58.6%	59.2%	+ 0.6%
Shortleaf Pine	25.8%	25.1%	25.1%	n.d.	25.2%	25.4%	- 0.4%
Longleaf Pine	5.6%	5.7%	5.7%	n.d.	5.2%	5.2%	- 0.4%
Bay-Shrub Wetland	0.4%	0.4%	0.4%	n.d.	0.4%	0.4%	No Change
Mesic Hardwood	2.9%	3.9%	3.9%	n.d.	3.9%	3.8%	+ 0.9%
Bottomland & Streamside	6.7%	6.6%	6.5 %	n.d.	6.7%	6.0%	- 0.7%

*n.d. – No data available for Fiscal Year 2005

b. Disturbances

1. Fire

Frequency and intensity of prescribed burning activities are slowly affecting changes in the vegetative communities found on the NFGT (Table 4). Burning, along with intermediate harvests (such as first thinning in 15-to-30 year old stands) have had significant influence on vegetative patterns and structure within the forested landscapes.

The trend in funding for prescribed fire activities in recent years (since 2000) has been to shift funding from wildlife and silvicultural sources to primarily hazardous fuels reduction funding. This reliance on hazardous fuels reduction funding is expected to continue for the near term.

Winter prescribed burning has long been an effective tool for controlling the hazardous buildup of fine forest fuels (leaves, pine needles, twigs, limbs, forbs, and grasses), for restoration of fire-dependent ecosystems (especially longleaf systems) and for wildlife, silviculture and range management. Today fire is also being used during the growing season to restore natural plant communities on the landscape, and to manipulate the floristic composition and structure of selected forest stands. Growing season burns are being used more often to manage certain fire-dependent forest communities such as longleaf pine, pitcher plant bogs, and RCW cluster sites. This has increased the flexibility and effectiveness of prescribed fire as a tool in the NFGT's many fire-dependent ecosystems, especially longleaf pine.

The primary natural factors influencing prescribe burn accomplishments are weather and fuels. Prescribed burning parameters such as relative humidity, fuel moisture, Keetch-Byram Drought Index(KBDI), Energy Release Component (ERC), Burning Index (BI), winds and smoke management conditions, are all influenced by short and long term weather patterns throughout the prescribed burning season. All burns are conducted within the established Regional/Forest Prescribe Burn parameters. During times of extended droughts and extreme fire behavior, no prescribe burns are implemented.

2. Regeneration

There is very limited regeneration harvesting being done at this time. An average of approximately 700 acres of regeneration is being added per year through current

management activities. Management and vegetative changes has been limited; most resulting from prescribed burning, wildfire, or storm-related disturbances.

If this trend continues, projected time frames for achieving forestwide and management area restoration objectives are not likely to occur. Either the *Plan* direction will need to be modified (less emphasis on restoration-by-regeneration of off-site species), or more future projects will need to include proposals for restoration harvests.

Table 6: Age Class Distribution						
By Forest Type¹						
Forest Type	Age Class					Total
	0-10	11-30	31-70	71-90	90+	
Loblolly Pine	4,161	53,558	78,434	138,631	64,626	339,410
Shortleaf Pine	1,672	22,784	12,949	43,784	64,261	145,450
Longleaf Pine	1,151	1,382	6,672	15,472	456	25,133
Bay-Shrub Wetland	0	0	0	267	1,093	1,360
Mesic Hardwood	0	15	0	47	1,882	1,944
Bottomland & Streamside	172	1,182	10,938	9,940	16,489	38,721
Total	7,156	78,921	108,993	208,141	148,807	552,018
Percent	< 1	14	20	38	27	100

¹ Sources: June 12, 2009 GIS inventory data for the NFGT.

c. Projected Future Actions

Service-wide emphasis on restoration and integration should continue to increase and emphasize prescribed burning in the restoration of fire-dependent ecosystems, especially longleaf pine. In addition, the emphasis of prescribed burning in the wildland-urban interface (WUI) is expected to continue in the foreseeable future. These WUI lands are usually more challenging to burn due to risk management concerns. Increased use of mechanical fuel treatments and utilization of biomass in the WUI can be expected.

Funding for prescribed burning activities is expected to stay at current levels or increase in the future. The primary funding mechanism for prescribed burning should continue to be hazardous fuels reduction. The use of site preparation burning will stay at the current low levels due to a decrease in the amount of regeneration activities being conducted.

An increased emphasis on growing season burning may be expected. Increased reliance on growing season burning will aid in the restoration of fire-dependent ecosystems, improve habitat for rare and endangered wildlife species, and increase the window and total acres treated for hazardous fuels. This increased window is especially important in years where the dormant season weather is not conducive to accomplishment.

2. Animal/Plant Habitats

a. Existing Conditions and Trends

1. MIS

a. Plants

The botanical program on the National Forests and Grasslands in Texas (NFGT) chiefly revolves around the collection and assimilation of Proposed, Threatened and Endangered Species (PETS), Regional Forester’s Sensitive Species (RFSS), and management indicator species (MIS) occurrence data from various field surveys into a database that can be accessed by project planners to adequately address potential impacts on these species as a direct result of planned forest activities. Surveys are generally conducted from March 1-November 15 (or later). These surveys are intended to document new occurrence records of TES and MIS, monitor existing known populations of these species, explore previously undocumented areas of the NFGT, and support district project plans when there is no botanical information for that particular project area on file.

An individual species’ status, distribution, and subsequent designation are based upon occurrence records, information and knowledge of the Forest Service, U.S. Fish and Wildlife Service, the state Natural Heritage Program, and The Nature Conservancy. Species are listed and delisted as additional information becomes available, so periodic revisions to the lists (PETS, RFSS, and MIS) are necessary.

The NFGT tracks 28 rare plants. Each plant falls into 1 of 3 categories of rarity: federally listed threatened plants (4 species), sensitive plants (22 species), and two management indicator plants. Plant *management indicator species* (MIS) represent the issues, concerns, and opportunities relating to the diverse plant resources and habitats on the national grasslands and national forests. There are two MIS plants on the NFGT that are not represented in the Regional Foresters Sensitive Species (RFSS): nodding nixie (*Apteria aphylla*) and Louisiana nerveray (*Tetragonotheca ludoviciana*) (Table 7).

Table 7. MIS – Management Indicator Species

Management Indicator Species (MIS)	Species Present? (Y/N)	Habitat Represented	Habitat Present? (Y/N)
<i>Apteria aphylla</i>	Y	Baygalls and acidic woods	Y
<i>Tetragonotheca ludoviciana</i>	Y	Longleaf pine and/or bluejack oak sandhills	Y

b. Animal

Based on survey results of NFGT’s point-count monitoring, increases in population density for the following management indicator species have occurred: Eastern Wild Turkey, Yellow-breasted Chat, Pileated Woodpecker, and Red-cockaded Woodpecker; stable population densities have been ascertained for the Northern Bobwhite Quail, Wood Thrush, Acadian Flycatcher, and Yellow-throated Vireo. None of the MIS animal species had decreasing populations (Table 8).

Table 8. Terrestrial MIS Status

MIS	Population Status	USFWS/USFS Status	Seral Stage Habitats
Northern Bobwhite	Stable	---	Tallgrass Prairie
Eastern Wild Turkey	Increasing	---	Forest Grassland Early, Mid, Late Succession and Old Growth
Red-Cockaded Woodpecker	Increasing	Endangered	Longleaf Pine (Longleaf Pine Woodlands and Savannahs) Shortleaf Pine (Dry-Xeric-Oak Pine Forest) Loblolly Pine (Mesic Oak-Pine Forest)
Pileated Woodpecker	Increasing		Forest Grassland Mid, Late Succession and Old Growth
Yellow-breasted Chat	Increasing	---	Forest Grassland Early, Mid, Late Succession
Yellow-throated Vireo	Stable	---	Bottomlands & Streamsides
Acadian Flycatcher	Stable	---	Bottomlands & Streamsides
Wood Thrush	Stable	---	Bottomlands & Streamsides
Whitetailed Deer	Stable	--	Forest Grassland Early, Mid, Late Succession and Old Growth
Gray/Fox Squirrel	Stable	--	Forest Grassland Mid, Late Succession and Old Growth

Game species population estimates are based on harvest data from Texas Parks and Wildlife Department (TPWD), habitat trends, and spotlight surveys for whitetailed deer.

Aquatic MIS were selected to represent the issues, concerns, and opportunities relating to aquatic resources on the NFGT. In measuring the biological integrity of the aquatic ecosystem, combinations of species were used to represent aquatic habitats and communities. Fish and macroinvertebrates were used as indicators to reflect the ability of aquatic organisms to move within and among stream reaches. A stream reach with high water quality, however, may contain no fish because of culvert impediments downstream, structural voids, seasonal flow changes, range limitations, or migration. Other fish were selected as management indicators of ponds and reservoirs. Table 9 displays the aquatic management indicators.

Table 9. Aquatic MIS Status

MIS	Population Status	Aquatic Habitat Category
Paddlefish	Stable	Large river systems
Sabine Shiner	Stable	Small streams and rivers having slight to moderate current
Dusky Darter	Stable	Medium to large streams of moderate to low gradients
Scaly Sand Darter	Stable	Large creeks to large rivers
Stonefly Guild	Stable	Flowing streams
Largemouth bass	Stable	Impoundments and ponds
Sunfish (RE & BG)	Stable	Impoundments and ponds
Channel Catfish	Stable	Impoundments and ponds

Largemouth Bass (*Micropterus salmoides*)

The largemouth bass the focal freshwater species in Texas and as the result of intensive TPWD stocking efforts, most native strains have been hybridized with the preferred Florida largemouth. This effort was strictly focused on growing larger game-fish and may have had the counter-effect of eliminating the native “northern” strain from most watersheds/water bodies. This species was selected for aquatic pond and reservoir habitats because of its focal status as a demand species.

All data and analyses are from NFGT electro-fishing reports, except for Coffeemill and Davy Crockett Lakes, which are monitored by TPWD out of the Texoma Fisheries Office. These sources also apply to sunfish and channel catfish summaries for these reservoirs.

In the *Plan*, the short-term objective was to have 40-90 bass per hour catch rate in all managed reservoirs. By 1998, this had been achieved in all but Ratcliff, Cottonwood and Clear Lakes (all of which developed weed problems, curtailing fertilizing and other management efforts). In 2001, Red Hills Lake yielded a 13.2 pound Florida hybrid female that was stocked as a fry in 1992. Black Creek Lake produced two fish over 10 pounds in 1999. Combined with the loss of federal hatchery fish and prevalent weed problems, management was curtailed on all but Crockett and Coffeemill Lakes.

Table 10. Largemouth Bass Survey Results From Specified Lakes During Fiscal Year. (Numbers indicate catch/hour via electro-fishing.).

Lake	2000	2003	2005	2006	2007
Black Creek	0	0	0	0	0
Coffeemill	90	0	100	0	0
Cottonwood	0	0	0	0	0
Clear	0	0	0	0	0
Crockett	165	108	82	118	0
Fannin	0	0	0	0	30
Ratcliff	0	0	0	0	0
Red Hills	40	0	0	0	0

Sunfish (*Lepomis species*)

This MI includes many common species such as bluegill, redear, green sunfish, warmouth and longear. Bluegills dominate most of the samples. Acting as a forage base or prey species for the largemouth bass, this group will not always exhibit concurrent trends.

The goal from the Plan was to maintain sunfish in the 40-250 per-hour catch-rate range in the short term. As evident below, this was achieved on all lakes that didn't have aquatic weed problems.

Table 11. Sunfish Survey Results From Specified Lakes During Fiscal Year. (Numbers indicate fish catch rate per hour via electro-fishing.).

Lake	1994	1995	1996	1997	1998	2000	2003	2005	2006
Black Creek	32	0	00	0	76	0	0	0	0
Coffeemill	78 (1992)	114	0	0	446	133	0	705	0
Cottonwood		5	0	0	0	0	0	0	0
Clear	0	29	0	0	24	0	0	0	0
Crockett	255	0	0	332	0	1967	108	696	0
Fannin	15	0	0	0	0	0	0	0	80
Ratcliff	0	0	39	0	0	0	0	0	0
Red Hills	0	97	0	0	0	126	0	0	0

Channel Catfish (*Ictalurus punctatus*)

This species was chosen as another sport fishing MI for aquatic ponds and reservoirs. It is a demand species and is highly sought by fisherman on public waters. As in many man-

made reservoirs, natural reproduction of channel catfish is low in NFGT lakes and ponds so this fish is stocked periodically.

Catfish monitoring is more difficult due to a slower electrical pulse required for electrofishing and their bottom-dwelling nature. Typically, we use indications of public success as a meter of abundance. Gill-net sampling leads to complete mortality, but body condition is a good indicator of population health. On the NFGT, monitoring is most successful through maintaining records on stocking (dates, times per year and rate) within individual water bodies.

Table 12. Channel Catfish Stockings.

Water-body	2003	2004	2005	2006	2007
Boykin	0	0	0	<i>830/8+''</i>	0
Bouton Lake	0	<i>~2,000/5''</i>	0	<i>1120/8+''</i>	0
Little Bouton	0	<i>~700/5''</i>	0	<i>0</i>	0
Sexton Pond	0	<i>~700/5''</i>	0	<i>0</i>	0
Double	0	<i>4300/5''</i>	2140/4	<i>5255/3.2-5.8</i>	0
Camp Letcher	0	0	0	0	0
Niederhofer	0	0	200/4	<i>1375/3.2-5.8</i>	<i>1000/7.5</i>
Office Pond C52	0	0	0	<i>30,000 fry</i>	0
Peden Tr. Ponds	0	0	0	<i>390/3.2</i>	0
Plantation Pond C76	0	0	0	<i>30,000 fry</i>	0
FS234B Pond C42	0	0	0	<i>30,000 fry</i>	0
SHNF Ponds	0	<i>1,950/5''</i>	0	0	0
Ratliff	0	<i>5000/5''</i>	0	<i>4000/4.8</i>	<i>2500/7.5</i>
DCNF Ponds	0	<i>1,950*/5''</i>	0	<i>375/4.8</i>	<i>500/7.5</i>
Red Hill	0	<i>3,400/5''</i>	0	<i>750/4.8</i>	0
Lake Fannin	0	0	0	<i>1,100/6-8''</i>	0
Windmill Lake	0	0	0	<i>1,080/9''</i>	0

All entries in italics were stocked by Texas Parks and Wildlife Department

Fish totals are followed by size in inches (number stocked/size)

~ = approximation

Paddlefish (*Polydon spathula*)

This species, endemic to the Angelina, Neches and Sabine River systems, was extirpated years ago when reservoirs were constructed and gravel was dredged from the rivers. Native adults were still reported in the lower Neches around the Big Thicket during the 1980s. All natural reproduction has ceased. TPWD, in cooperation with the NFGT, made a concerted effort to restock the river systems with fingerlings. Paddlefish were stocked into the Neches from 1989 to 1998, the Angelina from 1989 to 1999 and in the upper Sabine River during the same time period. Subsequent habitat surveys (1996 - 1999) revealed that the preferred backwater spawning habitat with gravel substrates was completely gone from the Neches River. Without the habitat necessary to sustain reproduction, paddlefish stocking was curtailed.

During *Plan* development, specialists identified paddlefish as a MI for larger river systems because it was felt there was a potential to regain sustainable (reproducing) populations in NFGT rivers. Since 1996, specialists have realized this species is likely only a “put & take” member of the river systems, so its value as a management indicator has been re-evaluated.

Dusky Darter (*Percina sciera*)

This species was selected as an indicator for low gradient streams due to perceived prevalence in these habitats based on preliminary sampling. However, this species does not prefer highly turbid streams. Many NFGT streams become turbid during storm events. More intensive surveys did not reveal this species with the regularity that was expected.

Moye found this darter in Camp Creek on the Davy Crockett NF in 1995, yet Kelly did not find it in 1994-95. Kelly also found it in Cochino Bayou, but it was not found by Forest Service personnel in 1998 and 1999. Both Kelly and Forest Service personnel found the species in Piney Creek in 1994 and 1999, respectively.

The dusky was documented on the Sabine NF in 1994 by both Espey-Huston and Rogers at different locations of Big Sandy Creek. Forest Service personnel did not find it there in 1998, but the rare harlequin darter was present. Only one individual appeared in Bull Creek during an intensive 1996-97 survey of three creeks in the Indian Mounds Wilderness done by Claudia Ebeler. The dusky appeared in all three 1996-97 samples taken by LaMont, in a reference stream adjacent to the forest. The dusky was absent in all 20 samples taken by Forest Service personnel throughout the Sabine NF, even though other darter species were present.

Sabine Shiner (*Notropis sabinae*)

Selected as an indicator for rivers and streams, this Region 8 Sensitive species is found in clear, silt-free streams with sandy bottoms and once ranged throughout the Angelina and Neches River Watersheds. This species is very uncommon due

to reservoir construction and reduction in preferred stream habitat in perennial streams, which mostly occurred adjacent to inundated river systems (Sabine River, Angelina River & San Jacinto River). In 1972, Provine found the Sabine shiner in four different streams on the Sam Houston NF.

Scaly Sand Darter (*Ammocrypta vivax*)

Although an inhabitant of creeks and rivers of various sizes with sandy, silt, gravel or hard clay substrates (Kuehne and Barbour 1983), the NFGT has found it to be more typical of higher flow/gradient streams with clear water. As such, it was selected as our gradient stream indicator. However, according to Kuehne and Barbour, “it is unlikely to be thriving...and serious depletions may be occurring at the margins of the range,” of which the NFGT would qualify.

Once common throughout the forest (Hubbs 1951, 1952, Provine 1972), this species has all but disappeared from the Sam Houston NF. Two intensive studies of many sites (Herbert 1999, Healy 2002) failed to turn up any scaly sand darters. Forest personnel picked them up on the East Fork of the San Jacinto in 1993, but they were missing in 1998. Being a silt-sensitive species, it is highly likely that the same sources of siltation that have eliminated most mussel species from the area streams (Howells 1994), have greatly impacted this darter.

The only record of this species on the Angelina NF was from Geeslin’s baseline survey in 2001, where it occurred in Scott Creek.

Jess Kelly’s 1995 baseline coverage turned up one individual on the Davy Crockett NF in Lynch Creek, which was dry the following quarter. No other record of the fish exists on the forest, despite numerous samples by agency personnel, although Lee et al (1980) show historic occurrence throughout the Neches River System.

The Sabine NF appears to be the best refuge for this species with ample 1994 (Espy-Huston) and 1995 (Rogers) records from Big Sandy, Conner, South Prong and McKim Creeks. They, however, did not appear in nearby Curry Creek (a tributary with lesser water quality and greater influences from private land). The fish was not found in any of the three Indian Mounds Wilderness streams to the immediate north (Ebeler 1998). Our most dated historic record for this species is in Boregas Creek (Hubbs 1949).

Stonefly Guild

The stonefly guild was chosen as an MI or index for rapid evaluation of stream quality and possible pollution problems. This guild includes all the macroinvertebrates as a group, rated by an established scoring system, such as the abbreviated EPA form used by the NFGTs or Hilsenhoff’s Biotic Index (HBI), which is similar to an IBI. The NFGT uses the abbreviated EPA method, while the extensive Hilsenhoff procedure is usually requisite of surveys we have contracted through universities.

No macroinvertebrates were collected in 2006 other than crayfish from six streams on the Angelina. Crayfish can exist in a wide range of water quality conditions, but are not considered tolerant of pollution.

2. TES Species

a. Plants

There are four plants listed as *threatened* under the Endangered Species Act that are known to occur on or near the NFGT. The federally-listed plants are Navasota ladies'-tresses (*Spiranthes parksii*), earthfruit (*Geocarpon minimum*), white bladderpod (*Lesquerella pallida*), and Texas prairie dawn (*Hymenoxys texana*). Navasota ladies'-tresses is the only PETS plant known to occur on the NFGT (Table 13).

Table 13. Proposed, Threatened, and Endangered Species (PETS) Plants

Species	NFGT Distribution and Habitat	Individual NFGT Units	
		Species Known To Occur	Is Suitable Habitat Present
<i>Lesquerella pallida</i>	Weches formation	Not on any NFGT units	
<i>Geocarpon minimum</i>	Saline glades and barrens		
<i>Hymenoxys texana</i>			
<i>Spiranthes parksii</i>	Catahoula pine barrens	Angelina NF	Yes

Federally-listed plant species known to occur and/or adjacent to various units of the NFGT.

Activities that might threaten the continued existence of any plant species may be deferred or modified to provide adequate protection for the plants. Depending on the species, this may not require the protection of every individual plant or population.

The number of rare plants or their population structure is not completely known. Ongoing botanical surveys throughout the national grasslands and national forests are adding to the knowledge of abundance, distribution of rare plant species and, to a lesser extent, for all plant species found in the NFGT flora. A full understanding of rare plant habitat requirements remains inconclusive. Several factors are considered when choosing species for listing as sensitive or conservation species.

Regional Foresters Sensitive Species are generally plants that are rare throughout their range. The NFGT also tracks the 22 rare plants listed in Table 14.

Table 14. Regional Foresters Sensitive Species (RFSS) Plants.

Species	NFGT distribution and habitat	Individual NFGT units	
		Species known to occur	Is suitable habitat present?
<i>Amorpha paniculata</i>	Angelina NF in bogs and baygalls	Yes	
<i>Agrimonia incisa</i>	Angelina NF in sandy longleaf savanna	Yes	
<i>Bartonia texana</i>	Angelina and Sam Houston NF in baygalls	Yes	
<i>Crataegus warneri</i>	Davy Crockett NF in deep sandy soils	Yes	
<i>Cyperus grayoides</i>	Angelina and Sabine NF in xeric sandylands	Yes	
<i>Cypripedium kentuckiense</i>	Angelina and Sabine NF in beech-white oak ravines	Yes	
<i>Dalea reverchonii</i>	LBJ Grasslands on goodland limestone soils	Yes	
<i>Hibiscus dasycalyx</i>	Davy Crockett NF in sloughs and marshes	Yes	
<i>Lachnocaulon digynum</i>	Angelina and Sabine NF in hillside seepage slope bogs	No	Yes
<i>Leavenworthia texana</i>	Weches formation	No	
<i>Liatris tenuis</i>	Angelina and Sabine NF in sandy longleaf pine savanna	Yes	
<i>Platanthera integra</i>	Angelina NF in hillside seepage slope bogs	Yes	
<i>Prenanthes barbata</i>	Angelina and Sabine NF in beech-white oak ravines	Yes	
<i>Rhynchospora macra</i>	Angelina NF in hillside seepage slope bogs	Yes	
<i>Rudbeckia scabrifolia</i>	Angelina and Sabine NF in hillside seepage slope bogs and baygalls	Yes	
<i>Schoenolirion wrightii</i>	Angelina NF in catahoula pine barrens	Yes	
<i>Silene subciliata</i>	Sabine NF on sandy post oak hillsides	Yes	
<i>Streptanthus maculatus</i>	Sabine NF where glauconite is present	Yes	
<i>Trillium texanum</i>	Angelina NF in baygall ecotones	Yes	
<i>Xyris drummondii</i>	Angelina NF in hillside seepage slope bogs	Yes	
<i>Xyris louisianica</i>	Angelina NF in hillside seepage slope bogs	Yes	
<i>Xyris scabrifolia</i>	Angelina and Sabine NF in hillside seepage slope bogs	Yes	

Regional Forester sensitive plant species known to occur and/or having suitable habitat on various units of the NFGT.

b. Animal

Table 15. Animal PETS by Status and Rank

No.	Scientific Name	Common Name	Status		Status*/Rank
			USFWS	USFS	State
1	<i>*Picoides borealis</i>	Red-cockaded Woodpecker	E	E	E
2	<i>Haliaeetus leucocephalus</i>	Bald Eagle	DM	S	S3
3	<i>Ursus americanus luteolus</i>	Louisiana black bear	T	T	--
4	<i>*Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat		S	S3
5	<i>*Aimophila aestivalis</i>	Bachman's Sparrow		S	S3
6	<i>*Pituophis ruthveni</i>	Louisiana pine snake	C	S	S2
7	<i>Notropis sabiniae</i>	Sabine shiner		S	S3
8	<i>Somatochlora margarita</i>	Texas emerald dragonfly		S	S2
9	<i>Faxonella beyeri</i>	Sabine fencing crayfish		S	SNR
10	<i>Procambarus nechesae</i>	Neches crayfish		S	S1S2
11	<i>Procambarus nigrocinctus</i>	Blackbelted crayfish		S	S1
12	<i>Fusconaia askewi</i>	Texas pigtoe		S	S1S2
13	<i>Fusconaia lananensis</i>	Triangle pigtoe		S	S1
14	<i>Lampsilis satura</i>	Sandbank pocketbook		S	S1
15	<i>Obovaria jacksoniana</i>	Southern hickorynut		S	SNR
16	<i>Pleurobema riddellii</i>	Louisiana pigtoe mussel		S	S1
17	<i>Potamilus ampliachaenus</i>	Texas heelsplitter		S	S1

T = Federally threatened, E = Federally endangered, C = Candidate species, DM = Delisted and monitored, S = Federally sensitive; S1-S4 = State rankings and are as follows: S1= Critically imperiled in Texas because of extreme rarity; S2 = Imperiled in Texas because of rarity; S3 = Rare and uncommon in Texas; S4 = Apparently secure in the state; SNR-not ranked.

Sources: USDA Forest Service, 1996, revised 2007. <http://www.natureserve.org/>

b. Factors Influencing Existing Conditions and Trends

1. MIS

a. Plants

Current vegetative conditions on the NFGT are largely a function of past uses and management activities. Most of the native overstory was removed from the national forests during extensive logging that occurred in the late 1800s and early 1900s. A large portion of the area harvested during this period was succeeded by off-site tree species that had not historically occupied these landscape types. The fire regime that shaped the upland habitats of the earlier grasslands and forests was significantly altered as well. These factors have changed the character and pattern of forest vegetation on much of the NFGT.

b. Animals

All of the above-mentioned changes to the NFGT have altered the distribution, extent, and quality of vegetative communities and the associated habitats available to terrestrial wildlife.

The condition of aquatic species habitat is influenced by a number of factors including fishing pressure, invasive weeds, alkalinity, man-made reservoirs, culverts, and siltation from OHV use of unsurfaced trails.

Generally, the smaller lakes generally have a good Largemouth Bass population balance up to the 14 inch legal minimum, above which they fall off to few or none. It is difficult to break this trend on small lakes where fishing pressure is high. Brush structures and vegetation can be used to protect some age classes from predation and make fishing take more difficult, but still cannot buffer the effects of heavy fishing pressure on population structure.

Alkalinity measured in 2007 was 15 ppm as CaCO₃ in Double Lake, 25 ppm in Ratcliff and 20 ppm in Red Hill, respectively. This measure of buffering capacity indicates how effective supplemental lake fertilization will be. A value less than 20 ppm indicates a need for liming as most fertilizer binds up with bottom sediments under these conditions. Ratcliff and Red Hill met the standard, while Double Lake did not. However, fertilization programs have been discontinued on all three lakes due to invasive weed problems or district priority.

With the availability of federal surplus fish in the last few years, we have succeeded in bolstering catfish age classes every year in order to provide a continuum of legal-sized fish. This species needs to be restocked in order to relieve the fishing pressure on the bass and sunfish populations.

Considering the inherited state of the habitat and the impact of man-made reservoirs and siltation from private lands, NFGT activities have not contributed to further decline of paddlefish populations. Unless TPWD determines conditions have changed and re-evaluate the restoration of paddlefish, the utility of this species as an MI is very low.

In 1999, Herbert found the dusky darter in six creeks on the Sam Houston NF. Only three (or 50 percent) of these same creeks contained dusky darters in 2000 (Healy). Despite an oil and brine spill and chronic brine leakage within the Clear Creek watershed, dusky darters appeared there in 1994, 1997 and 2000. Being silt-sensitive, recent absence of dusky darters from other creeks could correlate with published accounts of widespread mussel disappearance within the watershed. Probable siltation causes are motorized use of unsurfaced trails and gravel surfaced roads.

Intensive samples done on the Angelina NF in 1980 and 2000, revealed no dusky darters in Graham Creek, while a 1996 survey turned up one individual. The species was present in Boykin Creek in 1995, but gone in 2000. This could correlate with the heavy off-road vehicle (ORV) use in the area, which has since been curtailed. Forest personnel found the species in Trout Creek in 1995, yet it was absent in 1997 (Moye, 1998), which could also correspond with heavy ORV use in this watershed. In a 1991 study of three Nacogdoches streams by Ahle, the dusky was absent from only the most urban of the three, possibly indicating sensitivity as an indicator.

Another historic record was added to NFGT database from an area just north of the Angelina NF in Lavaca Creek near Etoile. Although the record is from 1950 (F.A. Dickins, SFA), it still has merit given that the Nacogdoches populations that range south to the Angelina River are now known to be the most stable for the species. Of the streams sampled in FY05, no Sabine shiners were recorded. In streams where this fish has no barriers, it occurs fairly routinely (Lanana/Banita Creeks). However it is rare to find this shiner on the forest due primarily to impediments that keep them from migrating too far up smaller streams.

Despite surveys of over 50 sites by Texas A&M cooperators and 20 sites by Sam Houston personnel, this species only appeared in a Peach Creek pool in 1998 during extreme drought conditions. Siltation problems on the Sam Houston NF from ORVs, roads and private land activities may have impacted this species and its habitat. The major impact to streams in the San Jacinto River Watershed was construction of Lake Conroe in the 1970s; this reservoir eliminated many former habitats. In 1995, Stephen F. Austin State University cooperator, Jess Kelly, found a few individuals in Cochino Bayou on the Davy Crockett NF. Subsequent surveys in the area have been unsuccessful. This forest also has some erosion problems, primarily caused by roads and crossings (Peterson 2000). Much of the land in the Cochino watershed is also in private holding and heavily altered.

This shiner has not been found on any other forest, despite intensive surveys. It does exist with regularity in Lanana Creek, just north of the Angelina. Since this is an urban creek running through Nacogdoches, the survival of this population is not assured.

Considered as a guild with other MIs, the dusky darter and Sabine shiner both absent from McKim/East prong in 2006 seem to indicate that habitat has declined. It can probably be narrowed down to water quality or flow. 2006 was considered a drought year and adequate flows may have been lacking.

Ground-disturbing activity in and/or near streamside zones lowers habitat quality for many of the stonefly guild species monitored. The Plan objectives dictate that we move toward a “good to excellent” rating in the short term. At this point, most of our streams are still in the “good” range. It is difficult to determine if pollution and sediment related disturbance is caused by NFGT actions or actions on private lands interspersed within the NFGT administrative boundaries. Using the HBI technique is good for identifying the existence of population problems, but does not help personnel determine the cause of the problems.

2. TES Species

a. Plants

Many plants tolerate a wide range of conditions. They therefore occur commonly and cover wide areas. The plant communities of the national forests and grasslands change as environmental conditions vary. Changes in land uses, including fire exclusion, farming, livestock grazing, timbering, and other activities have most likely altered the abundance of many plant species on the NFGT. Changes in habitat conditions have caused some

plants to become rare, while others have likely always been rare and limited to specialized habitats.

Species that survive in extreme habitats often become rare if habitat conditions change. Some tolerate life in habitats too harsh for common plants. Others have adapted to specific niches in specialized habitats. Species which grow only in calcareous prairies, for example, depend on specific soil types, fire regimes, and the absence of an overstory for their continued existence, and survive drought better than woodland herbaceous species. Some plants are adapted to life on rock outcrops, in riparian forests, or in sandy woodlands. Certain species have specific survival requirements that can be satisfied only by bogs with wetland soils.

While these plants survive under harsh conditions, they often cannot tolerate changes in their habitat. For example, if a road altered the water flow into a bog, causing the bog to dry out, the habitat could be changed to the extent that upland plants invade the bog, displacing the wetland species. When humans modify these habitats over wide areas, such plants become even scarcer.

In order to thrive, some rare plant species may depend on the disturbance created by fire. Fire reduces competition because it kills some species. To effectively seed-in and grow, many herbaceous plants native to the longleaf pine ecosystem need fire-created open spaces that have been bared to mineral soil. Decades of effective fire suppression have limited the open spaces these plants need, thereby causing them to drift toward rarity.

b. Animals

Disturbances can adversely affect rare species (PETS and Conservation species) more so than non-rare species (most of the NFGT's MIS, non-game species, and game species) because of rare species' narrower ecological niches; rare species do not adapt as well as more common species with broader ecological niches. Humans are the primary disturbers of terrestrial wildlife on the NFGT: cross-country 4-wheeler riders, trail riders on designated trails, year-round recreationists (including hunters) throughout the Forest, USFS personnel and contractors conducting timber management, fire management, recreation management, and wildlife management activities can have an adverse impact on terrestrial species. Adherence to NFGT's Revised Forest Plan negates the adverse impacts of disturbances to wildlife to an acceptable level.

c. Projected Future Actions

1. MIS

a. Plants

A large portion of the forest communities will likely continue to transition into the later successional classes. A significant prescribed burning program is expected to continue to burn over 100,000 acres per year to reduce hazardous fuels and improve habitat for wildlife, including the endangered red-cockaded woodpecker.

b. Animals

Prescribed burning is required to meet the Revised Forest Plan objectives of restoration of forest types historically occurring on the Forest and maintaining conditions suitable for many native plants and wildlife. MIS populations will be monitored, but the majority of species are not expected to significantly change in abundance on the NFGT in response to increased prescribed fire. Many species that are restricted to fire-maintained landscapes will potentially benefit from increased burning frequency. The range of some shrub and midstory nesting species using overgrown fire-maintained habitats will be reduced, but ample suitable habitat for those species will be available on the NFGT in infrequently and/or unburned forest types (MIS Report 2006).

With a public demand species, the need for change would be based on public input. The NFGT has been able to provide great opportunities for a fortunate few in the bass fishing realm, with two 13+ lb. bass taken from Ratcliff Lake in this reporting period. In Texas, fish of this size can be turned in under a state trophy program for angler prizes and recognition. These successes are likely based on past intensive management efforts in Ratcliff Lake, which have been curtailed in recent years in order to control aquatic weeds. We are able to still provide fishing success with other species, but bass emphasis is totally dictated by public demand and priorities of the particular Ranger District, not biological indices, so need for change is relative. Also, the “need” for the Forest Service to provide trophy bass fishing on lakes, that are too small to sustain such performance while in the proximity of huge state-managed trophy bass reservoirs, is of questionable necessity. This becomes especially apparent when the intensive labor and cost is considered. We have logically evolved into providing recreation area campers with a quality fishing experience, but not necessarily trophy bass angling.

The 32.8 catch rate in Coffeemill was said to be the highest ever, yielding healthy fish of legal size and larger. Conversely, populations have declined in Lake Davy Crockett since fish in the 11-12” size were not present, so there was no size class to provide the minimum 12” legal fish. Those present were healthy with excellent growth. Stocking was recommended in 2007 and 2008 to augment missing size classes.

Although the paddlefish is a protected species, one criterion for MIS designation, it does not aptly fit the other criteria. It is not easy to monitor and is not a good indicator of river habitats due to its rare and nomadic nature. An Index of Biotic Integrity (IBI) guild system would be much more useful in riverine systems.

The Dusky Darter has been absent from quality habitats for no apparent reason. It has also been present and missing in back-to-back intensive studies. There almost appears to be a geographic trend, with the occurrence fading as you go north and west on the NFGT. If stream gradient is a factor, this should only apply to the north Sabine, where streams have higher gradients. Dusky darters are rare on the Angelina, but then occur immediately north around Nacogdoches. The recommendation is to drop the dusky darter as an exclusive “low gradient” indicator during the next Forest Plan Revision process and add a cadre consisting of the bluntnose darter/slough darter/redfin darter/and dusky darter. Bluntnose and slough darters also seem to appear interchangeably in low-gradient habitats and redfin darters may be more transitional between low and high gradients.

These indicators would really be more effective as guild indicators, like the macroinvertebrates. The IBI is widely accepted and gives any species of darter the same score for being present. This helps eliminate the bias of habitat nuances, migration and other factors that contribute to anomalous results.

It is apparent that the Sabine Shiner is extremely depleted on the forest. Reintroduction into a suitable watershed that lies mostly within FS holdings would be advisable. According to what we have learned from their life cycle requirements, preferred and/or essential habitat necessitates an unimpeded reach of at least 13 miles (Casey Williams 2003). Repairing and limiting erosive activities on other reaches of the forest may serve to improve habitats and increase the likelihood of natural reoccupation.

As with the dusky darter, the same logic applies to the scaly sand darter, although it is further complicated by its limited range and sensitivity to perturbations. It is clear that this species has become rare on the Sam Houston NF due to the same conflicts with ORVs, roads and private land uses that have caused siltation and made habitat unsuitable for mussels in the San Jacinto Watershed. The soils are too fragile for standard protocols and large storm-flow volumes exacerbate any exposed soil problems. In terms of this species as an indicator, it should be dropped in favor of an IBI guild system during the next *Plan* Revision process. This species does not have near the distribution of the dusky darter and may be interchangeable with the redfin darter in some areas. It also appears to have a guild relationship with other aquatic indicators this year. Although more finite in displaying causative parameters, macroinvertebrates basically reflect what is being found in the fish community. This is a good technique that should be continued for evaluation of water quality and identification of stream species composition.

2. TES Species

a. Plants

The prescribed fire program will continue in the foreseeable future, with a goal of burning much of NFGT lands on a 3-to-5 year rotation. This fire frequency will play an important role in restoring rare plant habitats to pre-settlement conditions, which is desirable. However, thick shrub growth on bogs and prairies has accumulated over years of fire suppression, and current prescribed fire is not always penetrating these locations. The result is a degradation of rare plant habitat as the shrub layer shades out rare plants found in the herbaceous layer. Also, growing season burns are more effective at controlling the shrub layer than dormant season burns; consequently, an increase in growing season burns is desirable.

Continued timber thinning, particularly in pine forests, is a desirable activity, as it allows light to penetrate to the forest floor, favoring the growth of rare plants in the herbaceous layer.

b. Animals

Under the *Plan*, as amended, the new USFWS Recovery Plan guidelines (*Plan Amendment #7*) will be implemented. This modified direction utilizes best available information for managing RCW habitat on federal lands.

3. Fish and Wildlife

a. Existing Conditions and Trends

1. Terrestrial Habitat

Game species' population densities on the NFGT are stable to increasing. The whitetail deer is the highest profile game animal in the Pineywoods of East Texas. Populations are monitored through a series of different surveys to evaluate the approximate density, the general health of the herd, and the impact of the deer herd on the habitat. This information is collected through a series of surveys including spotlight lines, age/weight/antler data collection on harvested deer, and browse surveys (TPWD).

Gray and fox squirrels are popular small game throughout the southeastern United States. Squirrel hunting is second only to whitetailed deer hunting in most forested areas. Squirrel populations closely parallel the previous season's mast crop; with populations rising when food is abundant. This factor varies due to weather and is generally not under management control.

Although Eastern wild turkey population densities vary greatly throughout east Texas, the restoration program has successfully achieved the goal of establishing populations throughout the region with an 80 percent success rate. Block stocking efforts were completed in 1999, with a total of more than 7,200 turkeys stocked at 321 release sites in 57 counties. Population densities are highest in the Red River Valley region, followed by Northeast Texas and the Southeastern Pineywoods. The first county-wide spring eastern turkey season was initiated in Red River County during April of 1995. Since 1995, hunting opportunities have expanded rapidly. Currently, there are 37 counties open for spring eastern turkey hunting in East Texas.

2. Aquatic Habitat

b. Factors Influencing Conditions and Trends

1. Disturbances

a. Terrestrial Habitat

Disturbances can adversely affect rare species (PETS and conservation species), more so than non-rare species (most of NFGT's MIS, non-game species, and game species) because of rare species' narrower ecological niches. Rare species do not adapt as well as more common species with broader ecological niches. Humans are the primary disturbers of terrestrial wildlife on the NFGT: cross-country 4-wheeler riders, trail riders on

designated trails, year-round recreationists (including hunters) throughout the NFGT, USFS personnel and contractors conducting timber management, fire management, recreation management, and wildlife management activities can have an adverse impact on terrestrial species. Adherence to NFGT's Revised Forest Plan negates the adverse impacts of disturbances to wildlife to an acceptable level.

b. Aquatic Habitat

Factors that continue to impact fish and aquatic ecosystems may include:

- Localized water quality problems — fecal coliform, low pH, total dissolved solids, and turbidity — that could potentially impact stream fisheries.
- Low dissolved oxygen due to lake turnover, resulting in die-off of plankton and fish communities.
- Short-term and long-term impacts of sedimentation, siltation, and hydrocarbon pollution resulting from timber harvest, road construction and maintenance, and minerals extraction.
- Lack of a full understanding of the occurrence and / or vulnerabilities of many mussels, crayfish, gastropods, and other aquatic species which may lead to their imperilment.
- Placement of road culverts which may become impediments to the movements of many stream fishes, reducing their ranges and limiting their function as mussel *glochidia* hosts. Forty six percent of all streams surveyed in 2006 (n=92) on the ANF, DCNF and SNF were impassable (Center for Aquatic Technology Transfer –CATT). 52 percent of all streams surveyed on the SHNF during 2007 (n=21) were impassable (CATT).
- Major highway development and construction disrupting the natural hydrology of the watershed.
- Any timber, agricultural or commercial activities on private land that do not practice Best Management Practices (BMPs).



Figure 1. Physical habitat alteration/degradation that restricts species movement.



Figure 2. A culvert restricting fish passage.



Figure 3. DCNF- Pine Spring Cr, 524, 25" outlet drop (2006).

c. Projected Future Actions

1. Terrestrial Habitat

Habitat alterations/degradations off the forest and in the neotropical migratory bird wintering grounds will continue. The Forest Service controls activities on the NFGT and it will comply with the management direction in the *Plan* which safeguards against activities which are excessively detrimental to terrestrial wildlife. Therefore, no projected future actions on NFGT that are detrimental to terrestrial wildlife species are likely to occur without mitigation. Off the forest and in neotropical migratory bird wintering grounds, however, habitat alterations/degradations undoubtedly will continue which will not bode well for NFGT management indicator species, game species, and PETS species.

2. Aquatic Habitat

The FS will continue to protect the forest watersheds and manage for viable populations of fish and aquatic species. The NFGT was established, in part, to protect the headwater streams that ultimately replenish and recharge our water table. The forest has strict guidelines in place to protect our streamside and riparian zones.

The forest will continue to manage for recreational fishing.

4. Soil and Water

a. Existing Conditions and Trends

1. Water Quality

The National Forest and Grasslands in Texas (NFGT) lie within water resource Region 12, the Texas-Gulf Region. The NFGT also lie within four water quality management basins: the Sabine River Basin, the Neches River Basin, the Trinity River Basin, and the San Jacinto River Basin. There are eleven 4th level watersheds within these drainage basins. The total volume varies annually, depending on climatic conditions and management practices within the sub-watershed.

Streams listed as impaired by the state that are flowing through and from the NFGT are listed for causes generally beyond the influence of NFGT activities (*i.e.*, bacteria, dissolved oxygen, mercury, and pathogens).

Conductivity is a measure of the capability of water to conduct electrical current and is caused by ionic concentration and total dissolved solids. Waters that have conductivity values between 10-100 micromhos (uS) are usually found to be unpolluted. Conductivity is typically higher in the summer months due to concentration from reduced rainfall. Conductivity is used on the NFGT as a grab indicator of impacts from oil-field brine, fertilizer and livestock concentrations. Anything over 200 uS is considered to be a trigger for scrutinizing sources of runoff above a sample point. In many cases, nothing more than open pasture land upstream is found, but those lands are often fertilized, grazed or both. In two cases where concentrated grazing and cattle had access to SMZs upstream, it led to four-fold increases in conductivity over background. These examples occurred on the Sam Houston and Davy Crockett NFs. On an occasion outside this reporting period, an upper tributary of Caney Creek on the Davy Crockett unexpectedly exhibited conductivity over 2000 uS. Knowing that prior samples had been 60 uS, we looked upstream at the Trinity County Airport for answers. The stream actually originates from a spring under the runway. An inquiry revealed that a private timber company had used the airstrip, without authorization, to load fertilizer on planes. Similar utility was found in tracking oil-field brine dumping and leaks over the reporting period.

Plotting conductivity on forest maps revealed an interesting trend. All readings around Alabama Creek on the Davy Crockett were consistently over 200 uS, with Lancaster Creek showing 1700 uS. Since the NFGT owns the entire Lancaster watershed, we walked Lancaster to its headwaters to find elevated conductivity throughout. It later became apparent that there is a naturally occurring saline formation in this area that is even expressed in saline flats with unique vegetation. In conclusion, conductivity appears to be a good parameter for indicating perturbations in a waterway or watershed, but must not be viewed subjectively without investigating likely sources.

2. Soils

The NFGT's soils have been intensively classified and mapped according to the criteria developed by the Natural Resources Conservation Service (NRCS) for Order II soil surveys. These soil surveys identify soil properties which are used to determine soil suitability for a variety of management practices and to indicate necessary mitigation. Soil properties also indicate ecological potential. Standards and guidelines have been

developed to reduce or mitigate the potential impacts of soil erosion or compaction. Erosion control guidelines generally set forth time frames, methods for revegetating disturbed sites, and erosion control practices based on erosion potential. To overcome the compaction problems related to certain management activities, guidelines associated with compaction and rutting potential identify time periods and soil moisture conditions when the soil can support specific practices and methods.

Soil quality reports that include monitoring and mitigations to ensure soil productivity are conducted on various project activities located on the NFGT. The purpose is to determine if soil losses from disturbed sites will lower soil productivity, as determined by the NRCS for any given soil type. Sites included are those that have been clear cut, site prepared, prescribed burned, and planted. The rationale is that these are the most intensively managed sites on the national forests, and if these sites do not exceed allowable soil loss, then other sites receiving less intense treatment will likewise fall within soil loss tolerances. Monitoring various projects has indicated that soil productivity is being maintained throughout the NFGT.

Each year watershed improvement activities are implemented on small projects across the NFGT. The NFGT had a watershed improvement annual target of about 50 acres from year to year.

In 2006, Natural Resources Conservation Service dug two soil pits on the NFGT. One was located on the Angelina and another on the Davy Crockett NF. Each pit was 4.5 feet wide by 8 feet long by 7 feet deep. Soil samples were sent to the NRCS National laboratory for classification. These points will also serve as interpretative areas for use by the NFGT and the public. The sites were immediately filled and rehabilitated after samples were taken, which resulted in no adverse resource damage. An estimated six pits are planned throughout the national forests in 2009 and 2010.

b. Factors Influencing Conditions and Trends

The types of activities normally thought of as potentially influencing soil and water conditions and trends on the NFGT include timber management activities (harvest and site preparation), road and trail construction, and prescribed fire. These activities involve use of heavy mechanized equipment capable of exposing soil, mixing soil, and compacting and rutting soil. In addition, prescribed fire can remove soil cover over broad areas exposing them to erosive forces, primarily storm runoff. Excessive loss of surface soil can lower soil productivity and impact water quality. Poorly constructed fire lines can erode and become rills or gullies. Skid trails and log landings inadequately stabilized, and roads and trails not properly constructed and/or maintained can erode excessively.

Another activity with potential and documented soil and water impact is recreational off-highway vehicle (OHV) operation on the NFGT. User created OHV trails can and have caused highly disturbed stream banks and excessive erosion in both the uplands and riparian areas. In many cases riders use firelines as OHV trails, destroying erosion controls on the firelines, which results in accelerated erosion and stream sedimentation. Areas adjacent to designated OHV trails also suffer from unauthorized use. Riders frequently ride off the designated trails and cause erosion in sensitive areas. Four wheel

drive vehicles operating in wet conditions on low level roads can and do cause damage to road surfaces and road drainage, which can then erode and cause sedimentation.

Designated OHV trails themselves can be erosion and sediment concerns. Some receive heavy use. Multiple passes, especially in wet conditions and with careless operation resulting in excessive wheel slippage, can and do result in soil movement. Without good control of users and proper trail maintenance these trails become significant erosion problems.

c. Projected Future Actions

1. Water Quality

Actions proposed for the future would utilize water protection mitigation prescribed in the *Plan's* standards and guidelines. Therefore, no Forest Service actions are expected to have any major effects. As projects are proposed, site-specific data will be used to determine effects and needed mitigation.

2. Soils

Law enforcement on the NFGT currently plays a role in protecting soil and water conditions. Law Enforcement Officers and Forest Protection Officers make regular contact with the public. They serve to educate national forest and national grassland users, and issue citations to violators causing soil and water damage. Possible grant funding may provide additional law enforcement presence and/or surveillance capability for future enforcement actions.

5. Riparian Habitats

a. Existing Conditions and Trends

*Stream channels will remain stable providing suitable water quality. **Limited** manipulation of vegetation will filter sediment, thus maintaining aquatic habitat for those dependent species (MA-4 DFC).*

If we use physical changes and water quality to gauge riparian health, it would appear that these habitats on the NFGTs are in a declining trend. Soil movement into riparian zones and streams generally follow man-made arterial intersects which are obvious and easy to monitor. Similarly, channel down-cutting and soil/substrate loss from streams and riparian zones is even more evident as there are many static structures in place that show changes in channel depth and substrate loss over time, basically in the same manner as a photo-point.

The riparian vegetation corridors that are used as measures of protection in filtering runoff to streams have also shown a declining trend on the NFGT.

The quality of water flowing within streams is supposed to reflect the effectiveness of the filtration character and integrity of the streamside management zone (SMZ) vegetation. This parameter is rarely completely under our control since streams pass through many

private tracts that often impact water quality with various practices ranging from livestock to oil and gas development. Within NFGT control, many new activities have been permitted that are not compatible with water quality/riparian areas and have not followed many *Plan* protocols or enforced protective measures in contracts.

A forest-wide watershed assessment within the Boswell Creek Watershed is planned for 2009. The assessment will analyze watershed conditions and vulnerabilities and their effect on water quality.

b. Factors Influencing Conditions and Trends

1. Watershed

Watersheds are land areas from which water flows. A number of factors determine how water comes off a watershed, or runoff, and the quality of that water. These factors include watershed drainage area, slope, shape, aspect, geology, soils, impervious area, drainage density, and vegetation.

Any activity in the watershed which affects any one of these parameters can affect runoff. Some of these parameters are fairly fixed and not easily altered by human activity. Others are more susceptible to management effects, such as vegetation, soil characteristics, and drainage density. Land conversions such as roads, urban development, industrial development, or commercial development increases impenetrability, resulting in more runoff to stream flow. Vegetative conversions, such as converting forests to crops, pastures, or rights-of-ways can reduce rainfall interception, evapotranspiration, and infiltration capacity of the soil, resulting in more runoff. Even converting from one forest cover to another can affect seasonal antecedent soil moisture content, therefore runoff, due to differences in evapotranspiration by the different forest types. Road and trail drainage systems, or any feature that routes storm water to streams, can increase drainage density and reduce the time of concentration by intercepting surface runoff and directing more water to streams faster than before. Even recreation activity can affect runoff by compacting soils, removing vegetation, and increasing drainage density through developed or user created trails. These watershed changes can affect the total runoff from a watershed, the timing of runoff, or both.

Flowing water possesses kinetic energy, and delivers that energy to the channels in which it flows. Stream channels, therefore, are affected by the stream flow. As stream flow increases, erosive potential increases, and channels are more prone to erosion. As flow decreases, streams can't carry as much sediment, and if sediment supply remains the same, channels may begin to fill in due to sediment deposition.

Roads and trails can also affect stream channels. Bridge and culvert crossings can alter stream energy in the channel by constricting flow or otherwise changing channel slope over short distances. The effects are easily seen at many crossings by looking upstream and downstream. Sediment or debris accumulation, or erosion can be observed above crossings, and channel bars and eroded banks below crossings.

Energy gradient changes can be caused by other actions, such as channel realignments. These energy gradient changes can have upstream effects. Channels adjust to new energy slopes and can head cut for some distance upstream until new stable slopes are

established. The effects can carry for a long distance into the upper watersheds, and considerable channel sediment can result.

Fifty acres of watershed improvement work was completed in the Denton Creek sub-watershed in FY 2007. This watershed covers the Lyndon B. Johnson National Grassland in Texas.

2. Riparian

Riparian ecosystems, as defined by the Eastern Region of the United States Forest Service, are areas “extending away from the bank or shore to include land with direct land-water interactions, and whose aerial extent is variable based on its ability to perform ecologic functions” (Verry, Hornbeck, and Dolloff 2000). Essential to this ecosystem then are water supply, soil, and the associated vegetation.

Water has to be in sufficient quantity and be accessible to the ecosystem. Water quantity can be altered in a number of ways, such as diversions, water withdrawals, or watershed alterations that change runoff patterns. If water quantity is sufficiently reduced, then it is not available for delivery to the riparian ecosystem.

Water access can be affected by channel changes which prevent water from reaching the riparian ecosystem. For instance, if a channel erodes such that stream flows which used to flood out of the banks stay inside the channel instead, then water isn't delivered to the riparian ecosystem. This can also result in increased channel erosion due to floods and erosive energy being confined to the channel and not distributed to riparian areas and flood plains. This condition can further reduce water access to riparian ecosystems.

Riparian soils are exposed to erosion from floods in streams or wave action along shore lines, and of course, soils removed from a riparian ecosystem are not available as a component of that system. Vegetation is important to holding those soils in place. Trees, vines, shrubs, and herbaceous vegetation help protect from floods or waves by slowing the erosive velocities of water and by providing cover from water erosion. Roots of these and other plants hold tightly onto soil particles so they aren't easily detached and carried away. Another factor affecting riparian soils is physical disturbance from off highway vehicles (OHVs). Operating OHVs in riparian areas destroys riparian vegetation, soil structure, and soil cohesiveness, and reshapes physical riparian form.

Sediment from floods is important to replace riparian soil lost through erosion. Water velocities slow as floods spread over stream riparian areas. Slower water doesn't hold as much sediment as faster water, so sediment drops from suspension. Dense vegetation also physically traps sediment from the water. Therefore, floods that can rob soils from riparian ecosystems through erosion serve a dual role of soil replenishment.

Vegetation that is so important in holding riparian soils in place makes up the above ground component of riparian ecosystems. Riparian vegetation provides nesting and foraging habitat for the associated fauna, but it also is an important energy source for aquatic biota. Factors affecting typical riparian vegetation presence or density include canopy closure, OHVs and other dispersed or developed recreation, and off-site vegetation such as dense loblolly pine stands.

Riparian trees that completely crown over reduce sunlight for some more intolerant vegetation. This can reduce stem density, soil cover, and some fine root density, not only affecting the vegetative component but also the soils. Direct physical destruction by OHVs of riparian vegetation and soils is widely documented on the forest. The same is true of other recreation activities occurring in riparian areas.

3. Roads

Riparian zones are most profoundly affected by roads, whether they be for public access or commodity access such as timber or oil and gas. Each road-riparian intersect not only removes the protective filter strip, but also forms an unnatural conduit that collects more water from slopes and moves it much more quickly into a channel than the same transect in native vegetation. Roads often “pull” water from slopes as the road profile cuts into soil layers and allows them to seep out into the road ditch rather than infiltrating normally into the soil horizons. *Plan* standards are written to enable needed road access with minimal impacts to resources; however, they are totally dependent on good decisions and implementation – *Design and construct roads to minimize siltation and be maintained to provide surface water drainage away from streams and into vegetated buffer strips or other filtering systems (FW-053).*

Roads create new unnatural conduits for transmitting water directly into riparian areas and concentrating this energy at one point, which is usually the stream channel. Planning and construction are often problem areas, but even more so is road maintenance because it has been viewed as an unchangeable parameter or “part of the system.” Any road on a slope must control runoff with wing ditches, crossover drains, etc. The NFGT will continue to monitor new road construction or reconstruction to make sure that these structures are built to standard.

Road drainage structures must be constructed properly so that silt does not enter into the streams. All wing ditches are supposed to be “J-hooked” following an FLT decision years ago. Care must be taken during road construction that wing ditches are built to standard.



Figure 4. Wing ditch on new road depositing silt in riparian area and dumping directly into creek due to lack of J-hooking.

4. Rights-of-ways (ROWs)

Rights-of-ways comprise the second major impact on streams because they are basically minimally maintained roadways for utility/pipeline access and maintenance by mowing. However, unlike roads they have no drainage control structure. Occasionally unpermitted crossing of Streamside Management Zones (SMZs) with heavy maintenance equipment can occur. ROWs should be monitored closely and any problems corrected as quickly as possible.

5. Firelines

Occasionally during fireline construction, personnel have crossed the creeks to get the job done rather than going around. Protocol has been to hand-rake 50' to the creek to protect the SMZ with a waterbar at the top. Often personnel have trouble distinguishing between ephemeral, intermittent and perennial streams and deciding where and when to cross. Training should be given to field going personnel to assist them with making better decisions on where and when to cross streams during fireline construction.



Figure 5. Austin Branch showing dozer activity through SMZ into channel.

6. Oil and Gas

Oil and Gas facilities and development greatly increased during the Five-Year Review period. Pads are often built adjacent to SMZs with poor drainage control resulting in material leaving the pad and entering riparian areas. This is not only limited to siltation, but also contamination in fluids escaping sites due to leaks or open storage flooded by rains.

c. Projected Future Actions

Management direction for the smaller floodplain areas is aimed at maintaining or improving aquatic and riparian ecosystems and water quality. Minimizing risks to flood loss and public safety are additional management concerns on the Forest. Management direction for wetlands is focused on preventing their loss or degradation.

6. Insects and Diseases

a. Existing Conditions and Trends

Southern pine bark beetles are the primary mortality agents of pines on the NFGT, and the southern pine beetle (SPB) historically has been the predominate tree killer. Loblolly and shortleaf pines are the preferred hosts of SPB, though longleaf pine and other conifers may be attacked during outbreaks. Infestations are initiated in weakened or wounded trees, or in pines previously attacked by other bark beetles. When populations are low, infestations rarely spread beyond the initial tree attacked. As populations build, expanding infestations begin to develop, and soon even healthy pines are attacked and

killed. Densely stocked pine stands are conducive to the establishment and spread of SPB infestations. The overall hazard for SPB on the NFGT is high, due to extensive stands composed primarily of loblolly and shortleaf pine. Some thinning of pine stands has been accomplished through funds provided by the SPB Prevention Program. Several thinning projects have been delayed by legal challenges, and future hazard reduction treatments are contingent on continued funding and judicial clearance.

The last SPB outbreak on the NFGT occurred from 1991-to-1994. Due to SPB suppression treatments, less than 2% of the susceptible host type was killed outside of wilderness. Within wilderness, over 40% of susceptible host type was affected. SPB populations have remained in the latent phase in eastern Texas for the past ten years. No SPB infestations have been detected since 1998. Very few SPBs have been collected in eastern Texas during the annual spring surveys. The current population trend is in contrast to observed cycles in the previous half century. SPB outbreaks typically occur every 7-to-10 years, and last 2-to-4 years. Suitable habitat for SPB is plentiful on the NFGT, and historical patterns suggest an outbreak is overdue. However, there is no indication that an outbreak is likely in the next two years.

In the absence of SPB, *Ips* bark beetles have been the dominant bark beetles on the NFGT during the past ten years. *Ips* beetles usually function as secondary bark beetles, only attacking dying, severely wounded, or weakened pines. *Ips* populations cycle with precipitation levels. During periods of extended drought, their numbers can escalate, and widespread mortality may occur. The general pattern of infestation consists of scattered individual trees, but multiple tree infestations can develop. Scattered, widespread pine mortality occurred during the drought of 2006, but *Ips* population numbers declined in 2007. Population levels are expected to remain dependent on precipitation totals.

The black turpentine beetle (BTB) is another secondary bark beetle. Attacks are confined to the lower 10 feet of bole, with a majority of attacks at the base of the tree. BTB attacks often occur subsequent to attacks by other bark beetles. Infestation levels may increase following storm damage or prescribed burning, but tree mortality is rare. The last reported BTB outbreak on the NFGT occurred in the 1960s.

Non-native invasive insects have not caused observable damage on the NFGT. Several exotic species of ambrosia beetles have been trapped on the NFGT, but none of them have achieved pest status to date. Potential pests such as the emerald ash borer, Asian longhorned beetle, the woodwasp *Sirex noctilio*, gypsy moth, and the banded elm bark beetle have not been detected in eastern Texas.

Tree diseases also have had little impact on tree growth and mortality on the NFGT. Fusiform rust infects scattered loblolly pines. This disease can cause galls or cankers that weaken the trunks or branches, which may lead to increased tree damage during storms. Annosus root disease is associated with well-drained, sandy soils. It is primarily initiated via thinning or other tree removal actions, as freshly-cut stumps provide a suitable infection court for the spores. The disease then moves through the roots to infect living trees. Visible symptoms have been rare and mortality levels low.

Brown-spot needle blight can cause severe growth loss or mortality of longleaf pine in the grass stage. Other pines may be infected, but only longleaf suffers significant damage due to an extended period in its unique grass stage. Impacts on the NFGT have been slight, but they could become more significant with the trend toward increased longleaf pine planting. The potential impacts of brown-spot needle blight could be diminished with improved regeneration technologies and integrated forest pest management.

Red heart is a disease affecting mature and overmature pines in the south. The fungus enters through broken branches stubs and spreads through the heartwood. Pines are not killed, but their structural integrity is compromised. Hoof-shaped fungal conks on the boles of infested trees are symptomatic of infection. Incidence of red heart should increase on the NFGT with the shift to longer pine rotations. Pines with red heart are favored by the red-cockaded woodpecker for cavity construction.

Another disease associated with aging pines is *schweinitzii* root and butt disease. Older trees may become infected through root damage or basal fire and mechanical wounds. Infection can spread to nearby trees with similar wounds or through root-root contact between trees. The fungus causes a red-brown, cubical rot of roots and the lower bole. Pines usually are not killed, but windthrow and breakage sometimes result.

b. Factors affecting Conditions and Trends

1. Disturbances

a. Fire. Wildfires have the potential to damage the roots and cambial layer, leaving pines temporarily more susceptible to bark beetles and disease. The prudent use of prescribed fire reduces the incidence of serious wildfires. Prescribed burning also can help increase the vigor of overstory trees by reducing competition from understory trees and shrubs. Prescribed burning is beneficial for longleaf pine in the grass stage, as it reduces the incidence and impact of brown-spot needle blight. However, too frequent prescribed burning, particularly in stands dominated by loblolly or shortleaf pines, may duplicate the effects of wildfire.

b. Severe storms. Lightning-struck pines are excellent hosts for pine bark beetles. Increases in the number of lightning-struck pines would increase the chances of survival for dispersing pine bark beetles, and facilitate the dispersion of bark beetles across the landscape. They also may serve as epicenters for expanding southern pine beetle infestations. Tornados, hurricanes, and other high wind events result in broken, windthrown, and otherwise damaged trees that are susceptible to insects and diseases. Secondary bark beetles quickly colonize the affected trees, but infestations generally do not spread to healthy residual trees.

c. Drought. Extended drought weakens pines, resulting in increased activity of *Ips* beetles and black turpentine beetles. During severe drought, *Ips* beetles may kill groups of pines rather than just individual scattered trees. Waterlogged root systems can stress

pinus, leaving them susceptible to bark beetle attack. Extremely wet winters and springs have been correlated with the onset of southern pine beetle outbreaks.

d. Thinning. Thinning reduces competition, increasing tree vigor. Lowering the basal area of pine stands lowers the southern pine beetle hazard. The ground disturbance and residual tree damage associated with thinning may temporarily increase susceptibility to insects and disease, but the long-term benefits greatly outweigh any short-term effects. Thinning can promote annosus root rot, but serious infections in eastern Texas have been and should remain rare. Damaged and diseased trees can be removed during thinning, improving overall stand health.

2. Successional Processes

The current *Plan* for the NFGT mandates longer rotations for pine stands for loblolly and shortleaf pine stands. Allowing trees to become overmature increase their susceptibility to insects and disease. Older pines typically are more susceptible to southern pine beetles. Maintaining pine basal areas near 80 ft²/ac in older stands helps offset this increased vulnerability. Older pines are primary hosts for *schweinitzii* disease and red heart, and an increase in the latter would be beneficial to red-cockaded woodpecker populations.

Selecting the right tree species for a site can minimize forest health concerns. Conversion of offsite loblolly pine stands to longleaf pine on should reduce the incidence of insect and disease problems. Longleaf pine generally is more resistant to health problems than shortleaf and loblolly pines when planted on suitable sites.

Most regeneration on the NFGT is natural. Natural pine regeneration has lower infestation levels of Nantucket pine tip moth than areas that were site-prepped and planted. Tip moth levels on the NFGT therefore have been very low. Natural pine regeneration may result in dense pine stands which eventually become susceptible to bark beetles. A combination of thinning and prescribed burning may be required to reduce the hazard. In areas that are planted, decreasing the number of trees planted per acre is recommended to reduce future bark beetle susceptibility.

Maintaining tree diversity within a stand also can lessen forest health problems. Increased prescribed burning in pine stands and midstory removal in red-cockaded woodpecker habitat serve to create pine monocultures. Keeping the basal area low and minimizing disturbances can help mitigate the impacts of insects and diseases in these stands.

b. Projected Future Actions

The NFGT will continue to conduct spring trapping for the southern pine beetle. NFGT also maintains communication and cooperation with other agencies including APHIS and the Texas Forest Service that monitor for potential pests such as the gypsy moth, sudden oak death, and *Sirex noctilio*. Incipient pest populations will be addressed swiftly to

prevent spread and diminish impacts. The NFGT will participate in the early detection, rapid response trapping program for non-native invasive beetles when funding is available.

The SPB hazard rating map created by the Forest Health Technology Enterprise Team will be used to plan hazard reduction activities, primarily thinning. Priority areas include high hazard stands near wilderness, adjacent to pine forest on private land, and in red-cockaded woodpecker management areas. The SPB strategic plan for the NFGT will be used to plan for the next SPB outbreak and effectively manage detection and suppression activities.

The NFGT will pursue alternate markets for the material cut during SPB prevention and suppression actions. Finding viable markets for all diameters of woody material should accelerate the pace of SPB hazard reduction.

Conversion of suitable sites to longleaf pine will continue whenever conditions, funding, and personnel allow.

7. Wildfire Protection

a. Existing Conditions and Trends

Extreme burning conditions are not a common occurrence on the NFGT. The most important reasons for this are that the condition of forest fuels in well maintained, short rotation, fire dependent ecosystems (Figure 6); low hazardous fuels buildup levels associated with these conditions; and typically frequent rainfall.

From 1998 through 2007, the NFGT averaged about 57 wildfires per year, 87% of which are human-caused. These fires burn an average of 664 acres on national grassland and national forest lands and 196 private acres annually.

A wide variety of techniques and practices are currently used to minimize resource loss and suppression costs from wildland fires. The appropriate management response to wildfire will be used. Appropriate management response for these fires can range from initial attack to a combination of strategies to confine the fire. The primary criteria for choosing the appropriate management response and the supporting fire suppression strategies are to maximize safety, while minimizing suppression costs, resource loss, and environmental damage. Suppression strategies and tactics are not selected to achieve resource benefits, suppression dollars are not used with the objective of achieving resource benefits.

According to the *Plan*, MA-7-43 and MA-7-47, Wildland Fire Use (WFU) may be conducted in designated wilderness areas (Management Area 7) following the completion of Limits of Acceptable Change process and preparation of Wilderness Fire Management Plans. For the time being, the Wilderness FMU will not permit Wildland Fire Use. Wildland Fire Use is not addressed for any other Management Area under the *Plan*.

The NFGT maintains no aerial detection resources and does not pay the Texas Forest Service (TFS) to conduct wildfire detection flights under the cooperative agreement between the two agencies. The TFS employs a system of aerial and fixed detection

resources, and has historically notified the NFGT of fires located on federal lands. While increased use of the national grasslands and national forests raises the risk of human-caused fires, it also contributes to early detection. The increasing presence of rural fire departments also contributes to overall early detection and suppression of small fires.

The fire organization is equipped with modern mechanized fire fighting equipment, including dozer units, used for plowing bare-earth firelines around wildfires, and Type 5 and Type 6 engines. Helicopters and large air tankers are sometimes used. Dozer units are by far the most common suppression tool. An exception is in designated wilderness, where preferred methods of suppression emphasize minimum-impact-suppression techniques using hand tools such as rakes, flaps, axes, shovels, backpack pumps, and aerial or ground delivery of water and retardants.

A Cooperative Agreement and an Annual Operating Plan is maintained with the State of Texas, Texas Forest Service (TFS). This agreement specifies initial attack responsibilities for all lands within and directly adjacent to the forest. It also provides for cooperation between agencies. The Agreement includes the operations of the Texas Interagency Coordination Center (TICC) which is a joint effort between the State of Texas, US Forest Service, and the Department of the Interior. TICC is responsible for coordinating the mobilization fire resources for state or national response.

b. Factors Influencing Conditions and Trends

1. Disturbances

Wildfire is among the oldest of natural phenomena. Today, the overwhelming majority of all wildfires in the south result from humans and the majority of those human-caused fires are arson-related. Most fires on the NFGT are of moderate intensity and are suppressed at a small size. This is a result of frequent and widespread prescribed burning that keeps forest fuels at moderate levels (Figure 6), and a fire suppression organization with mechanized fire suppression equipment.

2. Successional Processes

Normally, as the average age of the national forests becomes older, surface wildfires are expected to result in less damage to stands. However, if fuels are allowed to accumulate, then larger, catastrophic fires will occur which can reset the ecosystem to an early succession stage.

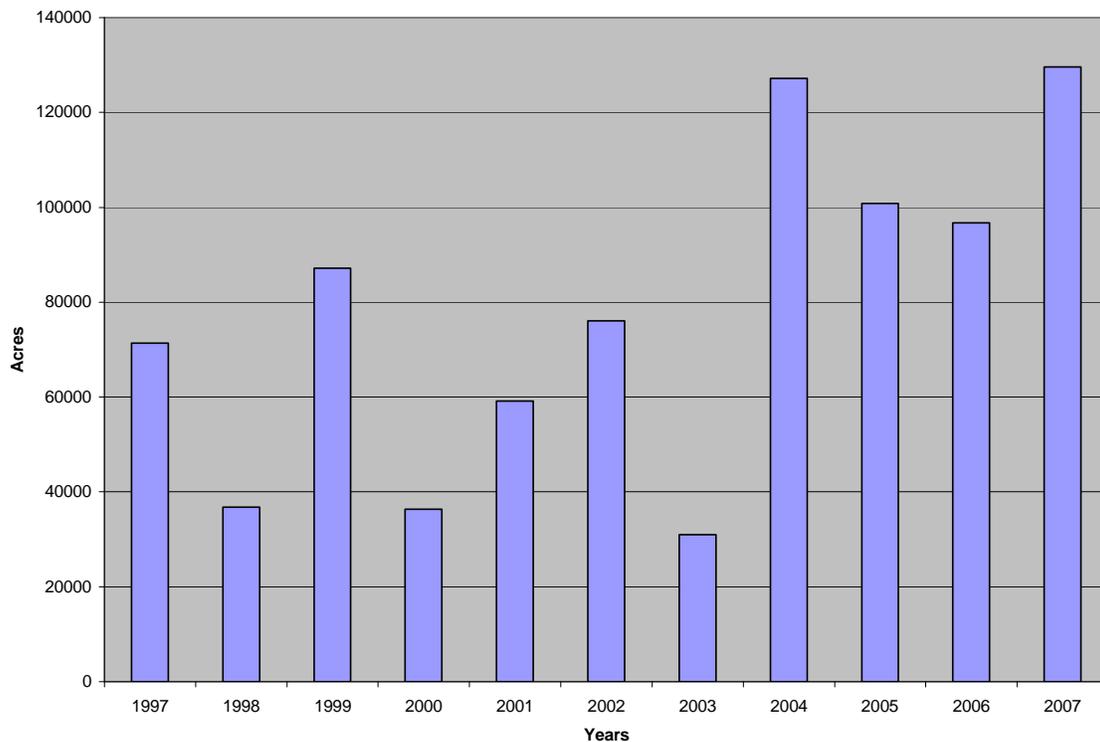
c. Projected Future Actions

All units on the NFGT have a large amount of wildland-urban interface (WUI) lands, in which wildland fuels are mixed with residences and subdivisions. Wildland fuels can pose a hazard when combined with residences. Treating these hazardous fuels on federal lands is a priority to the NFGT. Treatments can take the form of prescribed fire or mechanically treating fuels on federal lands to reduce the fuel loads prior to a period of fire danger. Since Hurricane Rita in 2005, the Angelina and Sabine Ranger Districts have been installing mechanically prepared fire breaks along landlines in order to provide

access into wildfires as well as provide a location to stop these fires. The NFGT takes WUI into consideration when planning fuel reduction needs.

Efforts are underway, in cooperation with the State of Texas, to write Community Wildfire Protection Plans for the counties with federal lands. These plans will document issues such areas in need of hazardous fuels reduction projects, evacuation plans, and fire contacts at all organization levels.

Figure 6. Prescribed Fire Acres



8. Air Quality

a. Existing Conditions and Trends

The NFGT is located in thirteen, predominantly rural, counties in eastern and northern Texas where the air quality is generally good. Smoke from wildfires and prescribed burning can adversely affect air quality, predominantly by the production of particulate matter and ozone. Smoke from NFGT prescribed fires is considered by State air regulatory agencies to be an intermittent contributor to a minor amount of air pollution.

Only one county contains NFGT lands where air quality is an issue. Montgomery County is part of the Houston metropolitan area, which is a non-attainment area for ozone. Smoke from NFGT prescribed fires is a minor contributor to ozone air pollution problems, both in terms of ozone precursor pollution (nitrogen oxides and volatile organic compounds) and small amounts of direct ozone generation.

All areas of the NFGT are in attainment of the National Ambient Air Quality Standards (NAAQS) for particulate matter (PM 2.5). Of the thirteen counties in Texas that encompass NFGT lands, there is only one monitoring station, which is located in Montgomery County. There are no monitoring stations located on NFGT lands.

The NFGT mitigates the effects of prescribed fires by following regional and forest standards and guidelines. Burn plans are prepared for all proposed prescribed fire burn units, identifying smoke sensitive areas and targets with existing visibility or air quality problems. In addition, site-specific concerns and smoke management criteria for individual burn units are identified in the individual burn plans.

b. Factors Influencing Conditions and Trends

1. Disturbances

Prescribed burning and wildfires have the highest potential for adversely affecting air quality on the forest. In order to mitigate these effects, daily fire weather forecasts include smoke management parameters for transport wind speed, mixing height, and dispersal. Burns are not ignited unless a forecast is obtained and all smoke management prescription parameters are met. A smoke-screening map is required to be attached to the burn plans identifying forecasted wind direction and the projected smoke plume. Smoke dispersal is monitored throughout the burn period of each fire. Smoke plume direction and spread is monitored via helicopter. Post-burn evaluation is performed and includes a requirement to note any smoke management violations.

c. Projected Future Actions

In order to restore and maintain more fire-dependent communities like longleaf pine, shortleaf pine, and grasslands the forest will utilize prescribed fire more frequently. This will have the potential to increase particulate emissions during the burning seasons.

B. Social and Economic

1. Recreation

a. Existing Conditions and Trends

Texas is a very large state, yet only 5.7 percent of the total 172 million acres in Texas are public lands open to the public for outdoor recreation opportunities. Of that 5.7 percent, only 2.6 percent are federal lands. The demand for outdoor recreation opportunities on the National Forests and Grassland is currently heaviest on the Sam Houston National Forest (NF) and Lyndon B. Johnson National Grassland (NG) due to their proximity to the large urban areas of Houston and Dallas/Fort Worth. Both the Sam Houston NF and the Lyndon B. Johnson NG are in need of a comprehensive plan to address how they will meet the huge demand for outdoor recreation opportunities that they will see over the next several decades. However, all areas of the NFGT experience demand for a variety of recreation activities including dispersed recreation, particularly hunting and fishing, developed recreation such as camping, as well as trail activities.

Dispersed recreation often occurs along roads that dead end at lakes and reservoirs. Initially, these areas offer access to the lake; in some cases the pressure of more visitors and no facilities can lead to resource issues such as human waste, littering, or erosion from vehicles leaving the roadway. More recently the regulation restricting camping to designated hunter camps during the deer gun season has concentrated use to a few areas on each forest. Opportunities exist for managing these areas more intensely and providing sanitary facilities, trash pickup, or Leave No Trace messages for visitors.

Many of the developed recreation areas on the NFGT were built during the era of the Civilian Conservation Corp, or CCC, during the 1930s. Although facilities have been upgraded and repaired over the years, there is a need for modernizing many of the recreation areas. Many areas need road work to accommodate larger vehicles along campground loops. A number of sites need camping spur renovation to accommodate multiple vehicles at campsites due to extended families and the use of boats and trailers as part of the camping experience. All developed sites need work to address the need for accessible sites that can be used by persons with disabilities.

The NFGT is unique in providing an array of trails opportunities including: hiking, bicycling, horseback riding and motorized trails. With over 400 miles of trail on the NFGT, a forest-wide trail assessment is needed to focus limited resources where they are most needed. Many trails are in need of signing, rehabilitation or relocation of trail segments to improve drainage, repair or replacement of bridges. Opportunities exist to partner with trail users and clubs to improve or expand opportunities.

The National Visitor Use Monitoring (NVUM) project offers reliable information regarding visitor use for the National Forests and Grasslands in Texas (NFGT). The NVUM project was implemented as a response to the need to better understand the use and importance of satisfaction with national forest system recreation opportunities. NVUM methodology and analysis is explained in detail in the research paper entitled *Forest Service National Visitor Use Monitoring Process: Research Method Documentation* by English, Kocis, Zarnoch, and Arnold; Southern Research Station; May, 2002.

<http://www.fs.fed.us/recreation/programs/nvum>). The first NVUM survey on the NFGT occurred in 2003. The second NVUM survey will occur in 2008.

The results of the 2003 NVUM survey for the NFGT are shown below (Table 16). It is estimated that a total of 686,709 site visits are made to the NFGT annually. For purposes of this study a “site visit” is defined as the entry of one person onto a national forests site or area to participate in recreation activities for an unspecified period of time. A “National Forest visit” is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A “national forest visit” can be composed of multiple “site visits.” Wilderness users were also surveyed.

The results of the NVUM survey are applicable to the entire NFGT, as a whole, but no information is available by District or site level. The gender distribution of NFGT recreation visitors was 81.9 percent male and 18.1 percent female. Nearly 98 percent of visitors were White, 2 percent were Hispanic, and 1.2 percent were Native American. Over 20 percent of users were under age 16, while 32 percent were 16 to 39 years of age, 20 percent were 40 to 49 years of age, and 28 percent were over 50 years of age.

Table 16. Annual Recreation Use Estimate for the National Forests and Grasslands in Texas

VISIT TYPE	VISITS	80% CONFIDENCE INTERVAL
SITE VISITS	686,709	19.7
NATIONAL FOREST VISITS	601,586	18.5
WILDERNESS VISITS	36,425	69.2

1. Dispersed

The National Forests and Grasslands in Texas (NFGT) encompasses approximately 672,800 acres. More than 560,000 acres are open for dispersed recreation activities. The NFGT’s theoretical maximum annual outdoor recreation capacity for dispersed recreation activities is determined by the amount of acreage within each Recreation Opportunity Spectrum(ROS) class. Under the current *Plan 527*, 897 acres are classified as *roaded natural*, 33,096 acres are classified as *semi-primitive*, and 2,615 acres are classified as *rural*. The theoretical maximum annual capacity is based on the assumption that the NFGT is used consistently throughout the year by the maximum possible number of people. This condition is unlikely to occur, since most use is grouped into specific time periods, not spread over an entire year.

The NVUM survey participants were asked what activities they engaged in. Below is a list of the top ten activities based on the percentage of respondents that participated (Table 17). Many of these are dispersed outdoor recreation activities associated with hunting or scouting areas for hunting. Many are secondary activities associated with hunting or fishing. Several other activities appeared on the top 20 list including: primitive camping (6.5% participating), gathering forest products (5.2%), horseback riding (4.1%), motorized water activities (3.3%), nature study (3.1%), backpacking (2.5%), visiting historic sites (2.6%), non-motorized water (2.4%), bicycling (2.1%), and OHV use (2.1%).

Table 17. Top Ten Activities

Activity	Percent Participating	Percent as Main Activity
Hunting	42.1	37.8
Viewing Wildlife	29.8	0
Fishing	21.1	17.3
Relaxing	20.3	1.6
Hiking / Walking	16.9	4.0
Other non-motorized	16.1	12.5
Viewing Natural Features	14.1	2.9
Developed Camping	13.0	6.7
Picnicking	12.8	2.8
Driving for Pleasure	12.3	6.7

2. Developed

The NFGT currently maintains 31 recreation sites across four national forests and two national grasslands. These areas offer nearly 500 improved campsites. In addition, there are 84 primitive campsites, 17 boat launches, 5 swim sites, 17 group picnic shelters, 4 family picnic units, 1 overlook, 3 wildlife viewing areas, and more than 400 miles of trails; these are displayed in Tables 18, 19 and 20.

Table 18. Developed Recreation Areas by Ranger District

Ranger District	Recreation Sites	Improved Camping	Primitive Camping	Boat Launch	Swimming Sites	Group Shelters	Picnic Units	Vistas/Overlooks	Wildlife Viewing Sites
	Number of Units								
Angelina/Sabine	15	177	50	10	2	6	5	1	1
Bayou Boat Ramp (Ang.)	1			1					
Bouton Lake	1		7						
Boykin Springs	1	33			1	1	4		1
Caney Creek	1		28	1					
Harvey Creek	1			1		1			
Sandy Creek	1	10		1		1			
Townsend Park	1	14		1		1			
Boles Field (Sabine)	1	20				1			
East Hamilton Boat Ramp	1			1			1		
Haley's Ferry Boat Ramp	1			1					
Indian Mounds	1	37		1					
Lakeview	1	10							
Red Hill Lake	1	28			1	1			
Ragtown	1	25		1					
Willow Oak	1		15	1					
Caddo/LBJ	7	71	26	3	0	3	7	0	0
Black Creek Lake (LBJ)	1	6		1			7		

Table 18. Developed Recreation Areas by Ranger District (cont').

TADRA	1		26			1			
Valley View	1	17				1			
Bois D'Arc (Caddo)	1	20				1			
Ranger District	Recreation Sites	Improved Camping	Primitive Camping	Boat Launch	Swimming Sites	Group Shelters	Picnic Units	Vistas/Overlooks	Wildlife Viewing Sites
Cofeemill Lake	1	12		1					
East Lk Davy Crockett	1	4		1					
West Lk Davy Crockett	1	12							
Davy Crockett	4	108	0	1	1	2	18	1	0
Neches Bluff Overlook	1							1	
Kickapoo	1						1		
Piney Creek Horse Camp	1	31							
Ratcliff Lake	1	77		1	1	2	17		
Sam Houston	5	142	8	3	2	6	0	0	1
Cagle	1	47		1					
Double Lake	1	65		1	1	2			
Kelly Pond	1		8						
Scott's Ridge Boat Ramp & Day Use area	1			1	1	3			
Stubblefield	1	30				1			
RCW Viewing Area									1
NFGT Total	31	498	84	17	5	17	30	1	2

There are numerous sites across the forests and grasslands offering a variety of outdoor recreation opportunities. As stated earlier, many of these sites are in need of modernizing to improve roadways and camping spurs, to offer swimming sites and other days use activities.

Table 19: Recreation Site Capacity

		PAOT Days for	PAOT Days for	PAOT Days for	PAOT Days for	PAOT Days for	PAOT Days for	PAOT Days for
	Total PAOT Days	Improved Camp	Primitive Camp	Boat Launch	Swim site	Horse Camp	Trail heads	Fishing Site
NFGT Total	2,344,885	1,291,495	98,550	208,050	0*	158,775	212,065	21,900
Angelina- Sabine	822,470							
(Angelina)	443,110	612,960	98,550	110,960	0	0	0	0
Bayou Boat Launch	19,345			19,345				
Bouton Lake Primitive Campground	12,775		12,775					
Boykin Springs Campground	84,680	84,680						
Caney Campground	116,435	116,435						
Harvey Boat Launch	62,415			62,415				
Sandy Campground	61,685	61,685						
Townsend Campground	85,775		85,775					
(Sabine)	379,360							
Boles Field Campground	36,500	36,500						
East Hamilton	10,950			10,950				
Haley Ferry	18,250			18,250				
Indian Mounds Campground	168,995	168,995						
Lakeview Campground	18,250	18,250						
Ragtown Campground	56,575	56,575						
Red Hills Lake Campground	26,040	26,040						
Willow Oak Campground	43,800	43,800						
C/LBJ	243,090	100,375	0	7,665	0	113,150	18,250	21,900

Table 19: Recreation Site Capacity (cont').

Black Creek Lake Campground								
Black Creek Cottonwood Campground	18,250						18,250	
Bois D'Arc Horse Camp	43,800					43,800		
Clear Lake Fishing Site	21,900							21,900
Coffeemill Campground	47,450	47,450						
Cottonwood Boat Launch	7,665			7,665				
East Lake Davy Crockett Campground	25,550	25,550						
Rhoades Lake	7,300	7,300						
TADRA Point Horse Camp	38,325					38,325		
Valley View Horse Camp	31,025					31,025		
West Lake Davy Crockett Campground	20,075	20,075						
Davy Crockett	425,225	0	0	0	0	45,625	21,900	0
514 Piney Creek HC	18,250					18,250		
566 Piney Creek Horse Camp	27,375					27,375		
Kickapoo Picnic Site	0							
Neches Bluff Overlook	21,900						21,900	
Ratcliff Lake Campground	357,700							
Sam Houston	854,100	578,160	0	89,425	0	0	171,915	0
208 Trailhead	38,325						38,325	
233 Trailhead	44,895						44,895	
234 Trailhead	63,875						63,875	
Big Creek Scenic Area Trailhead	5,475						5,475	
Cagle Campground	210,240	210,240						
Double Lake Campground	259,150	259,150						
Kelly's Pond Campground	14,600							

Northwest Trailhead	19,345						19,345	
Scotts Ridge Boat Launch	89,425			89,425				
Stubblefield Campground	108,770	108,770						

*Swim sites are included under PAOTs for the particular campground in which they occur

Table 20 below lists the miles of trails found on each national forest or grassland in the NFGT, by major use type. Trails rely heavily on volunteers for accomplishing most of the work including: brushing, signing, tread maintenance, monitoring, and litter pickup at trail heads. Many of these trails have large bridges. When bridges need major repair, or replacement, the cost is often prohibitive. Several bridges on the Lone Star Hiking Trail have been in need of replacement for several years. A forest-wide look at all trail systems is needed to explore alternatives for better meeting the needs of the public, completing maintenance and monitoring, and replacing expensive bridges; alternatives may include re-routing trail to areas that do not require bridges, adding loops to make the trail system more conducive to short-term recreation opportunities, and offering multiple-use of some trails to address the needs of all users.

By Ranger District							
Ranger District	Trail Name	Length (miles)	Hiking	Horse	ATV/ Motorcycle	Bike	
Permitted Uses							
Angelina	Sawmill Hiking Trail	5.5	x				
Sabine	Trail Between the Lakes Hiking Trail	28.0	x				
Caddo	Bois D'Arc Horse Trail	16.0	x	x		x	
LBJ	TADRA Horse Trail	60.0	x	x			
	Black Creek Hiking Trail	4.0	x				
Davy Crockett	4-C Hiking Trail	20.0	x				
Sam Houston	Sam Houston Multi-Use Trail	85.0	x	x	x	x	
	Lone Star Hiking Trail	129.0	x				
	Double Lake Mountain Bike Trail	7.0	x			x	
	Cagle Hiking Trail	1.0	x				

Table 20: Trails

By Ranger District							
Ranger District	Trail Name	Length (miles)	Hiking	Horse	ATV/ Motorcycle	Bike	
			Permitted Uses				
Forest Total		408.45					

b. Projected Future Actions

1. Dispersed

The Travel Management Rule required all national forests and grasslands to limit off-road motorized use to designated roads, trails or areas, by vehicle type and season of use, if applicable. Implementation of the Travel Management Rule may impact motorized use opportunities and overall management in the dispersed setting. By restricting motorized travel to designated routes only, maintenance will be reduced in dispersed areas and concentrated on the designated routes. While the maintenance needs on the designated routes may increase, it will be in a controlled area rather than spread throughout a large undetermined area. Some recreational opportunities will be reduced for those relying on motorized vehicles for access to dispersed recreation.

2. Developed

The implementation of the Travel Management Rule may affect developed sites; as motorized access to dispersed sites is eliminated campers may chose developed campsites.

Recent completion of the Scott’s Ridge Day Use Area will increase opportunities for day use and swimming opportunities for that area.

c. Reasonably Foreseeable Events Outside Agency Control

Texas has historically led the nation in percent growth of population in the three areas that showed the largest population growth from 1990 to 2000; Dallas-Fort Worth, Houston-Galveston, and the Texas-Mexico border. By 2000, Texas had the second largest total population among the states and also had the third largest Anglo population (11,074,071) the second largest Black population (2,421,653), the second largest Hispanic population (6,669,666), and the fourth largest Other population (685,785). The face of Texas is changing. By 2030, Hispanics will probably be the largest group among an expected 34 million Texans. The growing population and changing cultural diversity of visitors will present challenges in terms of meeting the increasing demand for outdoor recreation opportunities and in addressing the needs of a more diverse visitor audience. Information, websites, brochures, and signing for the Hispanic population will be required. Demand for more day-use and opportunities for family gatherings is likely to

increase. The age structure of Texans is changing. In the year 2000, fewer than 1 in 10 Texans were over age 65. By 2040, nearly 1 in 5 Texans will be over age 65. The number of households has increased rapidly in Texas, but households have become smaller and more diverse. From 2000 to 2040, households are projected to increase from 7.4 million to 13.6 million. In the absence of change in socioeconomic differentials, income growth will not keep pace with household growth and average incomes will decline (Murdock et al., 2002).

The Federal Land Recreation Enhancement Act (REA) was passed in the 2005 Consolidated Appropriations Act (PL 108-447) and signed into law by President Bush on December 8, 2004. The 10-year Act authorizes the Secretaries of the Interior and Agriculture to establish, modify, charge and collect recreation fees at federal recreation lands and waters as provided for in the Act. The types of fees and where they will be charged are now closely monitored. Any changes to fees or new fees now will have to go through a rigorous process and come before the Recreation Advisory Committee (RAC). The RAC will meet one-to-two times per year to review and recommend fee changes.

Existing recreation sites and dispersed areas are unprepared for the increase in visitors that will occur over the next few decades. Access to lakes, reservoirs and other water bodies will continue to grow; a number of roads will need repair or upgrading to handle the increased use. Roads within campgrounds will also need repair and upgrading to handle larger vehicles. The need for directional and regulatory signing for recreation areas will increase. Gates, signs, and other means will be increasingly needed to clearly show closed roads on the forest.

2. Scenery

a. Existing Conditions and Trends

Most of the area that is now national forest land had been cleared by timber harvest or for agriculture prior to acquisition by the federal government in the 1930s. Today most of the national forests are perceived visually as a natural, heavily forested, relatively flat-to-gently rolling landscape supporting dominant overstories of loblolly, shortleaf and longleaf pine with scattered hardwoods. Areas of hardwood overstory occur primarily along river and stream drainages.

On the national forests, the amount of mid-story and understory vegetation primarily determine viewing depth. Loblolly and shortleaf pine typically have heavily vegetated understories (approximately 85% of the national forests), while longleaf pine (approximately 5%) stands have open understories if they're frequently underburned. Periodic prescribed burning creates or maintains sparse understories in pine stands for a brief period of time. In general, the flat-to-gentle terrain, and customarily dense mid-story and understory vegetation limit viewing depths to less than 1/4-mile; long distance views across the national forests are limited.

A sparse mid-story and understory depend on frequent prescribed burning, so the visual character of infrequently burned or unburned areas is much different. Riparian areas and transitional zones not normally exposed to fire often support a dense understory of shrubs and small trees, contributing to the overall visual variety of the landscape.

Due to the dominant evergreen pine overstory of the national forests, fall color displays are not a major scenic attribute, although areas with a heavier deciduous hardwood component sometimes exhibit moderate levels of color. Flowering trees and shrubs – such as dogwood and wild azalea – growing primarily on moister sideslopes and consistently produce impressive spring flower displays.

Within the overall matrix of this landscape, some small areas or inclusions such as bogs and cypress swamps possess unique visual characteristics. This contributes to the variety and attractiveness of the landscape.

The national grasslands (NGs) offer a marked contrast to the national forests; long-distance views are commonly available due primarily to topographic relief. The vegetation on the LBJ NG is a mixture of tall pasture grasses, live oak, black jack oak, post oak, and mesquite. The Caddo NG has a heavier cover of trees, primarily post oak, black jack oak, and eastern red-cedar. The topography on the LBJ NG is more rugged with many straight and steep slopes of considerable linear extent. A substantial amount of scenic variety is present on the national grasslands as a result of the landforms, such as slopes, ridges, mesas, and stream valleys.

The Forest Service has developed and adopted a system for the management of visual or scenic resources: the Scenery Management System, or SMS. The SMS provides an overall framework for the orderly inventory, analysis, and management of scenery. The system applies to every acre of land administered by the agency and to all management activities, including timber harvesting, road building, stream improvements, special-use developments, utility line construction, recreation developments, and fire management. The *Plan Final Environmental Impact Statement (FEIS)* describes the results of scenery analysis on the NFGT. The approximate acreage and percentage of the various *scenic integrity objectives* (SIOs) on the national grasslands and national forests are shown in Table 21. The variations in acreages reveal the overall level of emphasis placed on the protection and enhancement of the scenic resource.

Table 21. Scenic Integrity Objectives

Scenic Integrity Objective	National Grasslands		National Forests	
	Acres	Percentage	Acres	Percentage
Very High – <i>Preservation</i>	380	1.5%	39,550	5.9%
High – <i>Retention</i>	0	0.0%	40,370	6.0%
Medium – <i>Partial Retention</i>	3,370	13.6%	104,810	15.6%
Low – <i>Modification</i>	21,010	84.9%	488,300	72.6%

b. Factors Influencing Conditions and Trends

1. Projected Future Actions

Management activities and projects with potential to cause visual deviations from a natural-appearing landscape would continue to occur, but may vary in size and frequency. Areas with large or frequent alterations would be difficult to mitigate, while areas with small or infrequent alterations would be more easily mitigated. Areas where historic vegetation communities are restored would be beneficial to scenic conditions in the long

run, and the overall perceived attractiveness of the landscape, even though initial regeneration activities would produce visual contrasts.

c. Reasonably Foreseeable Events Outside Agency Control

Natural events such as hurricanes, tornadoes, or southern pine beetle infestations are expected to continue. These openings would appear visually out of place in a heavily forested setting. On the other hand, as stated earlier, they would also contribute spatial diversity and opportunities for viewing a progression of successional vegetation stages.

3. Heritage

a. Existing Conditions & Trends

The National Forests and Grasslands in Texas (NFGT) has a large number of archeological and historical sites which have not been evaluated for their eligibility to the National Register of Historic Places. The vast majority of these sites have been discovered as the result of cultural resource surveys undertaken to benefit other resource management activities, such as timber sales, road construction, land exchanges and fire management. From 1995-2007, the forest operated under the terms of a Memorandum of Understanding (MOU) with the Texas Historical Commission (THC) and the Advisory Council on Historic Preservation (ACHP). This MOU, which tiered to the Southern Region Programmatic Agreement, called for the implementation of a set of milestones, described in a Cultural Resource Management Plan (Martin *et al.* 1995), in lieu of following a strict compliance methodology as described in 36 CFR 800.4-800.6. These two documents allowed the forest to initiate and implement a number of streamlined processes for addressing the NFGT's National Historic Preservation Act (the Act) Section 106 compliance obligations. In exchange, the NFGT would emphasize broader, landscape scale analyses and fuller compliance with Section 110 of the Act. In 2007, the NFGT, THC and ACHP agreed to void the MOU since it was in need of updating to incorporate changes that have occurred as a result of amendments to NHPA since 2000. Since mid-2007, the NFGT has been operating under the standard provisions of 36 CFR 800.4-800.6 on all undertakings. Work has begun on a new forest-level Programmatic Agreement (PA) that will once again provide streamlined efficiencies in the NHPA Section 106 compliance process. As the NFGT has stated that one of its strategic goals for the near future is to see the timber/vegetation management program grow, it is anticipated that such a growth in just these two resource areas would seriously impact the ability to remain in compliance with NHPA Section 106 for all projects.

The NFGT continued working towards establishing formal government-to-government relations with several federally recognized tribes: The Caddo Nation of Oklahoma, Alabama-Coushatta Tribe of Texas, Choctaw Nation of Oklahoma, and the United Keetoowah Band of the Cherokee. In FY2002, the NFGT and the Caddo Nation of Oklahoma completed the repatriation and reburial of human remains and associated objects accidentally excavated in 2001. This singular event contributed greatly to enhancing the government-to-government relationship with the NFGT, and laid the groundwork for additional cooperative efforts with the Tribe. The Forest has also assisted

the Caddo Nation, Choctaw Nation, and Alabama-Coushatta Tribe with resolving management issues centered on tribal cemeteries by providing equipment and expertise in the field of geophysical archeological prospection. Through the use of ground penetrating radar, the NFGT staff were able to assist the Tribes with identifying the location of unmarked graves in several tribal cemeteries, enabling them to make informed decisions regarding protection and expansion of those cemeteries.

Sites are monitored during other resource management activities to ensure that there are no inadvertent effects upon site integrity. In addition, condition surveys of specific Priority Heritage Assets are conducted at least once every five years, as per FS Manual direction. In 2005 and 2006, there were 14 recorded incidents of heritage resource vandalism; however, only one citation was actually issued, resulting in a misdemeanor charge and fine under 36 CFR2 61.9(g) & (h). The Heritage Resource and Law Enforcement staffs continue to work together to investigate and eventually prosecute violations of Archaeological Resources Protection Act (ARPA) and the general regulations affecting archeological and historical resources.

The NFGT has a large number of unevaluated archeological sites that are in protected status. These sites should be evaluated; it is the current thought that the vast majority of these will prove to be ineligible for listing in the National Register of Historic Places, and may therefore be removed from protective status. Development of a Historic Preservation Plan will address the needs for such evaluations, and identify specific contexts which may be applied in these determinations. There are also a number of properties, primarily buildings but also some sites, that have been determined eligible, but have never been formally submitted for listing on the Register. Efforts should be made to complete the nomination process for all such properties.

It is NFGT policy that all project reviews and consultations pursuant to Section 106 of the National Historic Preservation Act (NHPA) be completed prior to agency decisions. For most of this review period, the NFGT was able to comply with this direction. Judicious application of the standards and guidelines defined in the Region 8 PA and the forest-level MOU enable the forest to attain this goal for all of the projects proposed under the *Plan*. Only in rare instances, with the most extenuating circumstances, did the NFGT sign decisions prior to completion of NHPA consultation. Between Fiscal Years 2003 and 2007, 21,019 acres of the NFGT were surveyed for the presence of historic properties. All of these surveys were the result of project proposals by other resource management programs, primarily timber and vegetation management, special uses, and prescribed fire programs. These surveys resulted in the identification of 104 previously unrecorded archeological and historical sites, none of which were thoroughly evaluated for inclusion on the National Register.

b. Factors Influencing Conditions and Trends

1. Disturbances

In September 2005, Hurricane Rita struck the Angelina and Sabine NFs. This singular event shaped the Heritage Resource Management Program for all of fiscal year 2006. Assessment of the storm's damage was conducted on over 200 archeological and historical sites on those two forests and completed by March 2006. The remainder of the year was spent monitoring over 60 timber restoration/reclamation projects ensuring that no historic properties were inadvertently damaged by storm-recovery operations. There were two instances where inadvertent damage occurred, but the effects were quickly mitigated and damage was minimal.

2. Projected Future Actions

Inventories for the presence of historic properties are ongoing. Driving these inventories are the needs of other resource management programs, such as timber, wildlife, engineering, and prescribed fire to remain in compliance with Section 106 of the National Historic Preservation Act of 1966. As the NFGT desires substantial growth in the timber and fire programs in the foreseeable future, there will be a need for substantial growth in the Heritage Resource Management Program to sustain compliance in these resource areas as they grow. One tool for facilitating an expanded Heritage Resource Management Program is the implementation of a new Programmatic Agreement (PA) for streamlining the compliance process and improving site locational strategies. Unlike the recently expired MOU, this PA focuses entirely on the NFGT's strategies for complying with 36 CFR 800.4-800.6 (NHPA S. 106), not with other sections of the Act. Partners in this PA will not only be the State Historic Preservation Office and the Advisory Council on Historic Preservation but also several Tribal partners that have expressed their desire to be consulting parties. Slowly and deliberately, the NFGT is moving toward full integration of survey data and predictive modeling with the forest-wide GIS database, and better site management with the tools provided by I-Web, the agency-wide relational database.

c. Reasonably Foreseeable Events Outside of Agency Control

No reasonably foreseeable events outside of agency control are identified at this time. However, as we have seen in 1998 and again in 2005, severe weather events may cause significant impacts to forest resources and programs. The probabilities for severe weather events will continue to hold steady; however, they are intrinsically unpredictable as to when and where they occur. Any tropical system affecting the upper Texas coast will have a potential effect on historic properties.

4. Forest Products

a. Existing Conditions and Trends

1. Timber

Demand for timber products has generally remained stable during the last five years. Several purchasers of NFGT timber sales have developed their niche in the finished product market. The small roundwood market has shown the largest fluctuation, due in part to mill closures. With the quality of NFGT timber and length of our sales, bidder

interest has remained stable to increasing on the Angelina, Davy Crockett and Sabine NFs. Bidder interest on the Sam Houston NF has declined due to mill closures. In addition, the Sam Houston National Forest is located on the western edge of the range of southern yellowpine which limits available processing facilities. During the reporting period, the costs associated with moving the raw material from the woods to a processing facility have shown significant increase due to rising fuel prices.

2. Other Products

Demand for Other Forest Products (Special Forest Products – SFP) on the NFGT is minimal. The most requested SFP is fuelwood, and is usually limited on the NFGT to dead/downed and hazard trees and is restricted to personal use. Available fuelwood material from regeneration areas is minimal due to both the lack of individual areas and the commercial timber removal.

b. Factors Influencing Conditions and Trends

a. Natural Disturbances/Processes

1. Timber

In September, 2005, Hurricanes Rita directly impacted the Angelina and Sabine NFs. NFGT timber sales offered in FY06 were predominately focused on restoration of these storm-damaged areas. Since minimal green timber sales were offered during this period and timber personnel were devoted to storm recovery efforts, this indirectly affected the timber sales offered on the Davy Crockett and Sam Houston National Forests. No long-term effects on NFGT timber sales from Hurricane Rita have been realized.

There has been no major Southern Pine Beetle outbreak in the past 10 years, and none is anticipated in the next year. However, that is always subject to change.

2. Other Products

Since only dead and downed trees are offered for fuelwood, windstorms and other natural disturbances will naturally provide opportunities for offering these products whenever there is an occurrence.

b. Projected Future Actions

1. Timber

Within the Southern Region, the need for timber sales to implement forest plan objectives is significant. The amount of timber offered is limited by funding and target levels. These levels directly affect the ability to hire adequate personnel to plan, prepare, and administer these sales. At current target levels, the NFGT currently has signed decisions to cover approximately four years.

The sale of green forest products on the NFGT has fluctuated from a low in FY2006 of 3.6 MMBF to a high in FY2007 of 31.1 MMBF. With current personnel, the NFGT is poised to offer 50 MMBF per year. However, recent funding levels have not provided

the opportunity to reach this level. If these funding levels remain constant or decline as expected, the backlog of projects that require timber sales will increase.

In FY2007, an Integrated Resource Timber Contract (IRTC) was awarded on the Caddo NG. This stewardship project involves the commercial removal of the invasive Eastern red-cedar (*Juniperus virginiana*). In the past, this material was cut and left on site, with the work accomplished through a service contract. If the market holds, the future for similar sales on the Caddo looks positive.

2. Other Products

There are no plans to increase the number of SFP offered on the NFGT.

c. Reasonably Foreseeable Events Outside Agency Control

1. Timber

Currently, demand for lumber and other construction materials are down due to the downward turn in the housing market. Since the paper manufacturing facilities are outside our current market areas, the demand for paper has little effect on the NFGT timber sale program. The majority of the small roundwood removed from the NFGT is used for dimension lumber and Oriented Strand Board (OSB). Since these products are directly tied to the housing market, they have been negatively affected by downturn in the housing market. Recently, the last remaining East Texas industrial landowner, Temple-Inland, sold approximately 1.3 million acres of land. They have kept their mills and continue to operate at this time. These lands and other divested industrial lands are now managed by Timber Investment Management Organizations (TIMOs) for a profit. As long as it's profitable and their inventory is present, it's anticipated these investment companies will continue to provide raw material. During the reporting period, the costs associated with moving the raw material from the woods to a processing facility have shown significant increase due to rising fuel prices.

2. Other Products

The NFGT does not expect any foreseeable events that may affect SFP in the future.

5. Minerals

a. Existing Conditions and Trends

The National Forests and Grasslands in Texas (NFGT) make up approximately 675,951 acres. Roughly 30 percent or 203,363 acres are reserved or outstanding private minerals, while approximately 70 percent or 472,588 acres are federal minerals. By the end of FY 2007, approximately 283,806 acres of the federal mineral estate were under lease for oil and gas exploration and development. This is approximately 60 percent of the total acres of federal minerals available for lease on the NFGT.

There are many factors which influence the desire by prospective bidders to acquire (by lease) the federal mineral estate. The investment in the potential development of the mineral estate, technological advancements into recovery from abandoned formations and

horizontal drilling, commodity prices, drilling costs, transportation considerations (pipelines), surrounding private minerals availability, and geology are all reasons that private entities express an interest in leasing, drilling, and producing on federal mineral estates.

There are currently 305 wells on the NFGT (Table 22), which is down from the total of 335 wells reported ten years ago. Some of the more shallow vertical wells were plugged for economic reasons.

Table 22. Oil and Gas Wells

Administrative Unit	Number of Wells
Caddo National Grassland	0
Lyndon B. Johnson National Grassland	73
Angelina National Forest	13
Davy Crockett National Forest	74
Sabine National Forest	65
Sam Houston National Forest	80
Total	305

There have been 65 wells permitted on the NFGT in the last five years; 47 within the federal mineral estate and 18 within the private mineral estate. Approximately 26 of the 65 wells permitted were for wells to be drilled from common well pads, reducing forest fragmentation. Of the 65 wells permitted, there were approximately 34 newly constructed well pads over the past five years. Approximately 5 of the 65 permitted wells were permitted to document a change in company ownership as the facilities were already in place. Well pads range from 1 acre to 4.5 acres, depending upon the formation drilled into. Table 23 lists oil and gas permitting data by administrative unit and year. In addition, from FY 2003 through FY 2007 there were seven seismic operations permitted that ranged from geophone only to full 3-D Vibroseis.

Table 23. FY 2003-2007 Oil and Gas Permitting

Administrative Unit	2003			2004			2005			2006			2007		
	Exp	R/O	FED	Exp	R/O	FED	Exp	R/O	FED	Exp	R/O	FED	Exp	R/O	FED
Caddo NG															
LBJ NG			2			1							1		1
Angelina NF														2	
Davy Crockett NF						6				2			1		
Sabine NF	2		<u>10</u>			<u>9</u>			<u>5</u>			3			1
Sam Houston NF		<u>3</u>	<u>2</u>	1	2	4		<u>7</u>			1	1		3	2
*Total	2	3	14	1	2	20	0	7	5	2	1	4	2	5	4

Exp – Exploratory wells; **R/O** – Re-entry into old well bores; **FED** – Change in operator ownership on existing facilities

Underlined numbers represent more than one well permitted from a single well pad

*Total (71) is greater than 65 because not all permits were active at the end of Fiscal Year 2007

Tables 24 and 25 display mineral activities that occurred in FY 07 as well as program, permitting and leasing trends since 1997.

Table 24. Mineral Activity on NFGT by Fiscal Year

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006*	2007
Minerals Program Budget	\$280,000	\$342,516	\$310,500	\$294,500	\$474,000	\$465,423	\$389,204	\$457,896	\$398,907	\$398,675 +\$75,000	\$457,809
Return to Counties	\$473,597	\$384,981	\$139,881	\$389,533	\$1,032,4066	**	**	**	**	**	**
Total Wells	335	303	295	277	277	285	277	292	308	299	305
U.S. Wells	242	222	213	198	198	195	184	198	209	200	206
Private Wells	93	81	82	79	79	90	93	94	99	99	99
Common Variety Mineral Permits [County Gravel]	2	2	2	2	No data	2	2	2	0	0	0

*In FY 2006, the NFGT received an additional \$75,000 from the National Forests in Mississippi for minerals program work (including contracts for reclamation)

**Information not available from Mineral Management Services

Table 25. Parcels and Acres Offered and Leased on NFGT by Fiscal Year

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Parcels Offered	87	7	66	2	63*	86	57*	16	1	32	57
Parcels Leased	64	2	59	2	61	83	18	15	1	32	57
Acres Offered	81,413	531	30,598	642	51,650	33,152	46,076	18,333	290**	14,797	23,383
Acres Leased	45,389	163	29,564	642	51,593	28,465	51,593	18,278	290**	14,797	23,383
Bid Income	No data	\$4,015	\$292,867	\$9,384	\$1,975,619	\$3,500,248	\$127,248	\$179,239	\$1,740	\$2,179,283	\$3,135,696

*Additional parcels were reported on but not offered due to split mineral estate (*i.e.*, private surface/US mineral ownership); such parcels must have BLM concurrence

** The decrease in acres in FY 2005 was due to an increase of Expressions of Interest which requires additional up-front work before the lease can be awarded; which is reflected as an increase of acres leased in FY 2006

Over the past five years, there have been five undesirable events on the NFGT. In FY 2003, there were three recordable events. Two tanks overflowed on the Sam Houston National Forest (NF) and one damaged pipeline resulted in a leak on the Lyndon B. Johnson National Grassland (NG). In FY 2007, there were two undesirable events; one

oil spill on the Sam Houston NF and one pipeline leak on the Angelina NF. All spills or leaks have been cleaned up, revegetated, and monitored to satisfactory standards. Table 26 lists Undesirable Events information on the NFGT.

Table 26. FY2003-2007 Undesirable Events – Leaks and Spills

Administrative Unit	2003	2004	2005	2006	2007
Caddo National Grassland	0	0	0	0	0
Lyndon B. Johnson National Grassland	1	0	0	0	0
Angelina National Forest	0	0	0	0	1
Davy Crockett National Forest	0	0	0	0	0
Sabine National Forest	0	0	0	0	0
Sam Houston National Forest	2	0	0	0	1
Total	3	0	0	0	2

With the exception of oil and gas, there has been little commercial exploitation of mineral resources within the National Forests and Grasslands in Texas. The lack of development is primarily due to the economic factors associated with the limited deposits and competing sources outside the area.

Known to occur within the NFGT are: oil, natural gas, lignite, ceramic clays, non-ceramic (bentonite) clays, iron ore gravel, iron-manganese concretions, asphaltic sand, glauconite, industrial and specialty sands, sources for crushed stone and uranium.

Currently, commercial operations for removal of mineral deposits are limited to oil and gas. The *Plan* does not allow for new quarries to be developed as private land alternatives exist. In 2004 the last remaining sand and gravel pits operated by Angelina and San Augustine Counties on the Angelina NF were formally closed. No pits are currently in operation. The only quarries that would be honored in the future would be on private mineral estates with proof of valid mineral ownership.

b. Factors Influencing Conditions and Trends

1. Projected Future Actions

It is anticipated that requests for oil and gas leases on the NFGT will continue, as will the leasing program. The NFGT has been divided into areas of high, moderate, low, and unknown potential for oil and gas development.

High potential: Geologic environments that are highly favorable for the occurrence of undiscovered oil and/or gas resources. This includes areas previously classified as known geologic structures (KGS). A KGS is defined as "...a trap, either structural or stratigraphic, in which an accumulation of oil or gas has been found to be productive, the limits of which include all acreage that is presumptively productive." Typically, these areas are on or near a producing trend and evidence exists that the geologic controls of reservoir, source, and trap necessary for the accumulation of oil and/or gas are present.

Moderate potential: Indicates the geologic environment is favorable for the occurrence of undiscovered oil and/or gas resources; however, one of the geologic controls necessary for the accumulation of oil and / or gas may be absent.

Low potential: The geologic, geochemical, and geophysical characteristics do not indicate a favorable environment for the accumulation of oil and/or gas resources. Evidence exists that one or more of the geologic controls necessary for the accumulation of oil and / or gas is absent.

Unknown potential: A region where the geologic information is insufficient to otherwise categorize potential.

The **Caddo National Grassland** is not located within any of the eight major plays of the East Texas Basin delineated by the United States Geological Survey (USGS). In fact, it is on the outskirts of the East Texas Basin. There is no production on the Caddo. However, there has been new development on private land adjacent to the district. The potential for oil and gas on the Caddo National Grasslands is **unknown**.

The **Lyndon B. Johnson National Grassland** is totally located within the Lower and Middle Pennsylvanian Fan Delta Sandstone and Conglomerate play of the Fort Worth Basin. The location of the Boonsville, South Alvord and West Chico Fields, in addition to the LBJ being entirely within a KGS verifies the **high** potential on this grassland unit. The Barnett Shale is one of the largest formations in the US and is located in the Fort Worth area extending into Wise County which makes up most of the LBJ Grasslands. There were three new wells drilled over the last five years.

The **Angelina National Forest** contains three geographic areas (Tyler basin structural play, Sabine Uplift oil play, and the Austin-Buda fractured chalk play of the Gulf Coast Basin). The entire Angelina NF has **moderate** potential for the occurrence of oil and gas reserves because it is located on the fringe of those three plays and is limited by other protected resources. There have been no new developments on the Angelina NF over the past five years.

The **Davy Crockett National Forest** is within the Tyler basin structural play (100%), the Woodbine-Eagle Ford play (50%), and the Austin-Buda fractured chalk play of the Gulf Coast Basin (50%). Within the Tyler basin structural play, there are *Class 6* fields (Decker Switch and South Laura Lavelle). [*Note: The US Geological Survey designates Class 6 and above as oil and gas fields having recoverable quantities of more than one million barrels of oil and natural gas liquids, or more than six billion cubic feet of gas*]. Because of the production on the NGFT, its location within two of the major East Texas Basin plays, as well as within the Austin-Buda fractured chalk play within the Gulf Coast Basin, the Davy Crockett has **high** potential for occurrence of oil and gas. Over the past five years, eight new wells have been drilled on the Davy Crockett NF.

The **Sabine National Forest** is within the Sabine Uplift oil play, the Sabine Uplift gas play, and the Austin-Buda fractured chalk play of the Gulf Coast Basin. At least three *Class 6* fields (Huxley, West Joaquin, and Hemphill) are located within the Sabine NF. In addition, the presences of the Hemphill-Pineland, Brookeland, and Huxley KGSs, at a

minimum, indicate the *high* potential of oil and gas occurrences on the Sabine NF. Over the past five years, 14 new wells have been drilled.

The **Sam Houston National Forest** is not located within any of the eight major plays delineated by the US Geological Survey; however, there is continued interest and production mostly from the private mineral estates within the forest. The reservoirs being drilled into are within the sandstones of the Upper Wilcox Group and the Yegua Formation. The traps are domal anticlines formed by regional growth faults of the Wilcox Fault Zone to the south of the forest. The play is considered small and poorly known. The location of the following fields: Coldspring, Coline, Mercy SW, Morgas, Moroil, and Waverly, in addition to the numerous KGS designations, indicate a *high* potential for oil and gas on the Sam Houston NF. There have been nine new wells drilled over the past five years.

There is a relatively high degree of uncertainty in forecasting the rate of drilling on the National Forests and Grasslands in Texas. While several leases have been awarded within the last five years, Applications for Permit to Drill (APDs) have been slow to develop over the past three years. A lease is often pure speculation purchased by someone hoping for a good investment that can sell to a drilling/production company. Approximately 20 percent of leases are drilled upon.

Based on analysis of the geologic data, trends, and other available information, the 10-year mineral prediction within the *Forest Plan FEIS* was relatively accurate, but could not fully take into account at that time the impacts of the Iraq war on the price of oil/gas, the increase in domestic demands, or how far technology would come. The *Plan* prediction in trends was not a threshold or limit for oil and gas development; it was estimation for future development based on known factors up until 1992. The “*Unconstrained Reasonably Foreseeable Development Scenario*” meant that geology and economics rather than the *Plan* alternative will determine the number of wells proposed.

Petroleum and natural gas markets are doing well with \$131/barrel oil and \$8.29/MCF well-head gas, but it takes a long period of sustained higher prices to stimulate smaller drilling programs, especially onshore. It should be noted that it is more expensive to drill on public land than it is on private surface since the environmental controls are more stringent, so sometimes drilling on the national forest becomes a last resort when private sites are not available. With the utilization of advanced technology more and more wells are being drilled as deviated holes, (directionally or horizontally drilled) depending upon the formation being drained so multiple wells can be drilled from one well-bore also multiple wells can be located on one well pad (which reduces forest fragmentation). Because of the use of horizontal drilling, private lands adjacent to the NFGT are riddled with wells – in many cases so that public lands may be avoided. Companies have become more willing to take risks on re-entering once thought uneconomical wells and to expand the known geologic boundary of where the formation ends with exploratory wells, thus expanding the formation boundaries to include larger areas. With the increased demand for petroleum products, the on-going war in Iraq, the continued rise in the price of oil/gas and the availability of the resource in Texas the oil and gas program on the NFGT will continue to increase until other reservoirs can be tapped or an alternative fuel is readily available to the American people.

c. Reasonably Foreseeable Events Outside Agency Control

As crude oil and natural gas prices continue to rise with the increased demands for petroleum-based products and market uncertainty, we will see more emphasis on increasing domestic supply. While it is difficult to predict the demand for federal minerals under Forest Service lands, site-specific analysis is conducted at the time of each new proposal to offset impacts to other resources.

Existing oil and gas development trends shows the continued demand for more domestic fossil fuels in the United States and leaves the NFGT in the position to assist the nation with its energy shortfalls and continue to protect and enhance other valuable resources.

6. Grazing

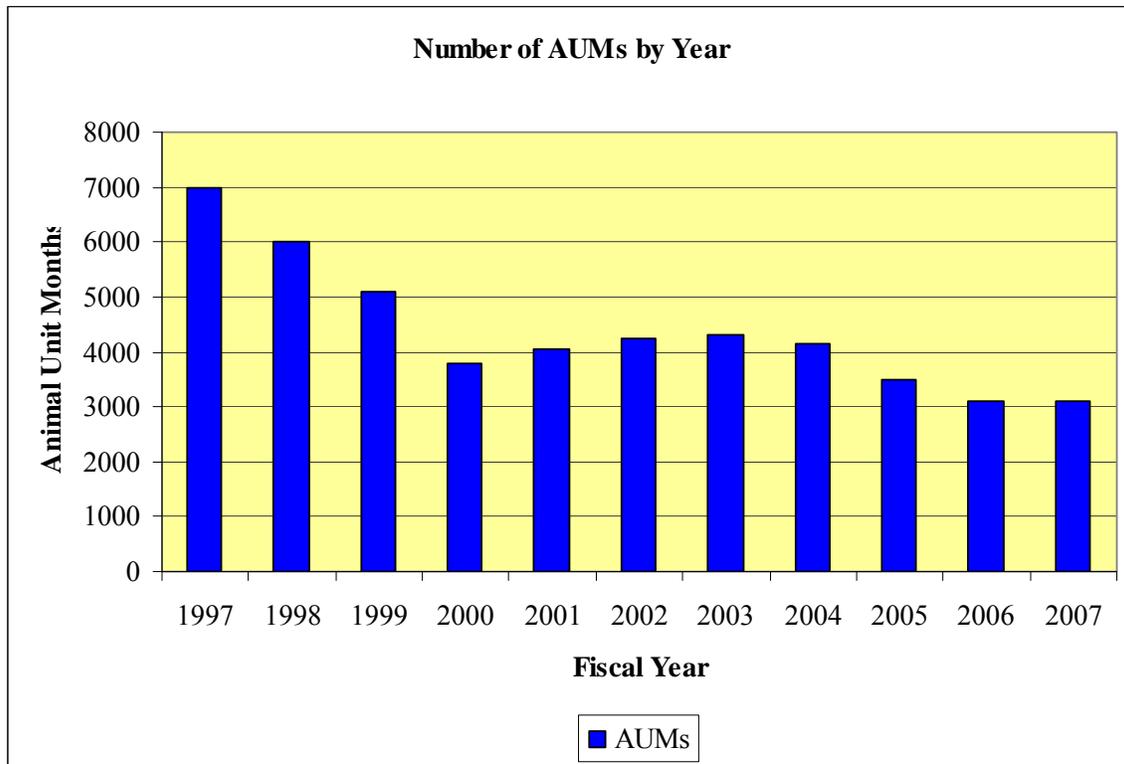
a. Existing Conditions and Trends

Approximately 500 cattle graze on the Caddo/LBJ National Grasslands as authorized under 17 grazing permits. No grazing is allowed to exceed four months on any one allotment/unit.

b. Factors Influencing Conditions and Trends

In 1998, the grasslands initiated a fundamental change in the way cattle grazing is managed. There was a shift from year-round grazing to seasonal grazing. This implemented a high intensity/low duration grazing system that resulted in a higher number of cattle grazing for a shorter grazing period. The change resulted in fewer total AUMs on the grasslands (an Animal Unit Month is a cow-calf pair grazing for one month). The downward trend in AUMs is displayed in Figure 7.

Figure 7. Animal Unit Months on the National Grasslands



c. Projected Future Actions

Concerns for the management of the vegetation on the Caddo/LBJ NGs includes reducing the cedar and oak encroachment, reducing erosion, minimizing the introduction of invasive species and increasing the native forbs and herbaceous cover. Continue cattle grazing as a tool to improve native habitat and reduce flashy fuels. Flashy fuels could potentially result in a catastrophic fire that potentially would threaten private property. The low intensity, long-duration grazing that best describes the grazing method on the Caddo/LBJ NGs has resulted in spot grazing. This means cattle over graze an area while selectively grazing the remainder of the unit. It is therefore the objective of managers to improve the distribution of cattle on any one unit while grazing on the Caddo/LBJ NGs. Reduce motts of persimmon, plum and sumac.

7. Landownership and Special Uses

a. Existing Conditions and Trends

1. Landownership

The National Forests and Grasslands in Texas boundaries encompass 1,915,035 acres; 675,808 acres of which are national forest and national grassland. Intermixed private and NFGT lands results in a patchwork-quilt pattern of ownership. This makes landline

maintenance, rights-of-way problems, administration of boundary encroachments and claims, and national forest and grassland management in general more challenging than in more contiguous forests. During the past fifteen years, approximately 236 acres have been added to the NFGT. This increase resulted from land exchanges, purchases, interagency transfers, and donations. Recently, land-for-land exchanges have become less viable for a variety of reasons. A rise in complexity and the proportion of fixed costs to be borne by the proponent, and closer examination of the net public benefit have resulted in fewer land-for-land exchanges.

The primary focus of the NFGT’s lands program from 2001-2007 was the disposal of administrative sites and lands under legislated authorities (Texas National Forest Improvement Act and Pilot Conveyance Program). The authorities allowed for the conveyance of six residential properties, five administrative work centers, and one youth vocational/technical training center to individuals, corporations, or counties (Table 27). The sale and conveyance of these lands may have minimally increased our administrative boundaries; however, an overall benefit accrued from the reduction of deferred maintenance on facilities and office leasing expenditures.

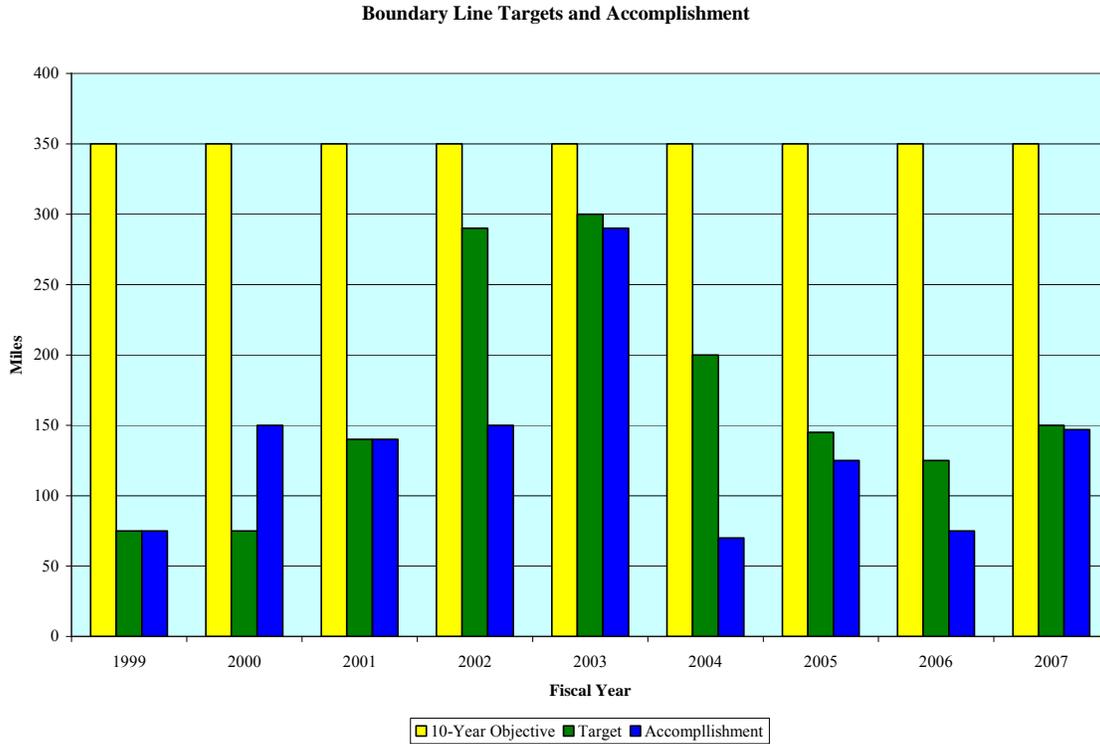
Table 27. Sites Disposed of Through Legislated Authority

Texas National Forest Improvement Act		
Administrative Site	Tract	Acres
Tenaha Ranger Dwelling	S-1391	0.37
Tenaha Asst Ranger Dwelling	S-1389	1.31
Yellowpine Ranger Dwelling	S-1388	0.61
Yellowpine Asst Ranger Dwelling	S-1390	1.17
Trinity Ranger Dwelling	K-30	4.99
Trinity Asst Ranger Dwelling	K-604	0.30
Gulf Coast Trade Center	J-91 & J-91a	54.70
Zavalla Work Center	A-53	19.00
Old Yellowpine Work Center	S-71	1.75
Subtotal		84.20
Pilot Conveyance Program		
Administrative Site	Tract	Acres
Apple Springs Work Center	K-57	10.23
Dreka Work Center	S-72	6.38
Coldspring Work Center	J-92	6.43
Subtotal		23.04
Total		107.24

There are approximately 3,300 miles where NFGT shares boundary lines with private property. Clearly defined boundaries are essential to managing the national forests and grasslands, and systematic maintenance is necessary to avoid disputes with neighbors and minimize trespasses on federal lands. The ten-year objective is to monument 350 miles of boundary lines per year. However, recent funding levels have not provided the opportunity to reach this objective. Landline maintenance targets and accomplishments for fiscal years 1999-2007 are displayed in Figure 8. In 2005, Hurricane Rita severely

affected boundary lines on the Angelina and Sabine NFs creating an urgent need for additional re-monumenting.

Figure 8. Landline Maintenance Targets and Accomplishments



2. Special Uses

Currently, the National Forests and Grasslands in Texas administer approximately 905 permits and easements authorizing the occupancy and use of national forest or national grassland surface. Land use “rental” fees are waived on approximately 30% of these authorizations. A breakdown of the various types of uses is displayed in Table 28. There is a national screening process which subjects each request to a rigorous review process prior to an application being accepted. Part of the screening process is to assess whether or not a request is appropriate for National Forest / Grassland’s surface and if the use must be located on public lands. All attempts to access private land options must be exhausted before an application will be accepted for encumbering public lands. With some proposals that involve landlocked property and no legal access, the screening process is not as complicated as government land is the only access option. More stringent guidelines and scrutiny prevents many initial requests from developing on public lands as a matter of convenience.

Table 28. Number of Special Use Land Authorizations

Land Use	2003	2007
Utility ROWs	160	152
Pipeline ROWs	0	0
Road ROWs Private & Public	491	499
Dept of Transportation & Forest Road / Trail Easement	0	0
Recreation-related Permit	39	54
Churches & Cemeteries	17	17
Agriculture & Residence	7	10
Watershed, Reservoir & Supply	7	8
Mineral – Pipelines, etc.	122	128
Mineral – Seismic Survey	2	1
Communication Sites	4	4
Research	4	4
Other Miscellaneous	25	28
Total	878	905

On February 27, 2006 the National Forests and Grasslands in Texas began to implement Cost Recovery for processing special use requests and for monitoring their construction and reclamation. With the implementation of cost recovery and passing the costs on to an identifiable recipient (the request does not serve the all or the majority of the public), many of the common convenience requests have dwindled.

There has been an effort to reduce the number of cemeteries, churches, mailbox, driveways and other permits especially where it has been determined that alternative access across private land exists or where a land exchange is advantageous.

Many of our cross-country requests have been maneuvered into existing open right-of-ways to reduce the loss of canopy and to better deal with forest fragmentation. Several utilities share already open corridors.

The numbers of new special use permits issued are shown in Table 29. The total number of special use permits issued over the past ten years varies from 20 to 58. This variation is due to the number of requests for permits, which fluctuates unpredictably from year to year.

Table 29. New Lands Special Use Permits Issued

Unit	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
Angelina	1	12	6	7	5	6	9	5	3	1	1	56
Caddo/LBJ	12	8	2	5	10	6	3	9	13	5	6	79
Davy Crockett	1	1	4	4	4	2	1	7	2	2	3	31
Sabine	4	3	6	9	18	13	11	14	4	7	5	94
Sam Houston	5	5	2	8	21	14	11	14	5	9	4	98
Total	23	29	20	33	58	41	35	49	27	24	19	358

b. Factors Influencing Conditions and Trends

1. Landownership

Landownership patterns are changing in eastern Texas. Many owners of large private tracts adjacent to or within the NFGT proclamation boundary had been nationally-based timber companies (*e.g.*, Temple-Inland, International Paper) who have recently decided to divest their land holdings to TIMOs (timberland investment management organizations) and REITs (real estate investment trusts). Forest neighbors who were once large timber companies with similar goals are becoming a myriad of different types of landowners, including subdivisions of private homes. The wildland-urban interface and its associated complexities is increasing in Texas. This is raising new concerns such as increased encroachment (whether intentional or not). It makes forest and grassland management more difficult, including fire suppression and prescribed burning. Any reduction in budgeting for landline maintenance may have far-reaching effects. There are less-visible effects such as increased non-commercial traffic on forest system roads and increased maintenance needs.

Portions of the NFGT are within a one-hour drive from the Houston and Dallas/Fort Worth metropolitan areas. Demand for non-commodity amenities from public lands, such as wildlife watching, hiking, hunting, and protection of ecologically significant lands is growing rapidly; but the land to provide for the public desire is quite limited. Through land exchange or purchase, the area of land available to the public can be modestly increased. Consolidation will improve management effectiveness. Acquisitions (*i.e.*, purchase and exchange) enhance and expand the provision of the amenities the public desires from the national forests and grasslands. At the same time, key tracts (such as those especially suitable to recreation or preservation of an ecologically significant feature) can be acquired.

The NFGT has a limited program of landownership adjustments through acquisition and disposal of lands in order to improve management effectiveness and enhance public benefits. Future acquisitions will be analyzed for meeting Forest Plan desired future condition and inclusion into surrounding management practices.

Mineral ownership also remains a factor in land adjustment. Every effort is made to keep surface and mineral estates together to provide for their unification in the future.

2. Special Uses

The implementation of Cost Recovery will continue. With the money generated from land special use projects that meet the screening protocol, money will return to the forests and grasslands for their use in special use administration. With the recent decline in access requests, the NFGT will need to be ever diligent in ensuring that the proponent has found suitable private land as an alternative and isn't furthering the encroachment situation.

c. Projected future Actions

1. Landownership

Due to the uncertainty of funding for acquisitions, land exchanges and tripartite land exchanges appear to be the most secure vehicles for meeting today's landownership acquisition objectives on a continuing basis. Even though Land and Water Conservation Fund (WLCF) funding is uncertain, occasional opportunities for acquiring key recreation lands do occur. Especially on the national forests, there is a good opportunity for significant exchanges with major landowners (either TIMO's or REIT's) due to their land ownership within national forest boundaries.

The NFGT is exploring the use of tripartite land exchanges using excess timber receipts to acquire land. A list of possibilities is presently being prepared for prioritization. The NFGT timber program is poised to offer up to 50 MMBF annually, which should provide ample opportunities for tripartite land exchanges. Using timber sale receipts to pay for needed land to compensate for habitat loss, recreation, access, and consolidation makes this method for land acquisition a viable choice.

Additionally, the NFGT has worked with the Southern Region to digitize title records.

2. Special Uses

Special Use Requests will continue to go through screening for acceptance and prioritization. All projects that are approved for application submittal will pay Cost Recovery for processing and monitoring. With the increase in oil and gas development and urban interface, requests will need to be analyzed for the best location regardless of cost to the proponent. The NFGT anticipates an increase in special use authorizations.

d. Reasonably Foreseeable Events Outside Agency Control

1. Landownership

The goal of the right-of-way acquisition program is to ensure that public lands are sufficiently accessible. However, the reluctance to grant unrestricted easements for road rights-of-ways across private lands is growing. This could complicate the completion of future acquisitions needed to furnish the legal access desired by the public.

2. Special Uses

Due to oil and gas development on adjacent lands and the urban interface, the NFGT will see more demand to cross federal lands in the future.

8. Access/Travel Management

a. Existing Conditions and Trends

Travel within the NFGT is based upon a transportation network suited to the needs of the user. This network includes U.S. and state highways (including federal aid primary, secondary, and farm-to-market roads); county roads serving farm-to-market and private land access; and Forest Service roads. The total network contains 6,061 miles of road of

which 2,536 miles are under Forest Service jurisdiction (Table 30). The transportation system also includes 27 bridges under Forest Service jurisdiction. While federal, state and county roads provide primary access into the national forest, Forest Service roads provide the intermediate and final avenues needed to administer, manage and protect public lands and resources.

Table 30. Transportation System Jurisdiction

Jurisdiction	Miles	Percentage
State	1,871	31%
County	1,581	26%
Forest Service	2,536	42%
Private	18	0.2%
Unknown	54	0.8%
Other	1	--
Total	6,061	100%

As shown in Table 30, 42% of the total mileage is under Forest Service jurisdiction. While road densities vary from area to area, on average there are approximately 5.7 miles of road per square mile. Of this, the Forest Service has authority to control access on about 2.4 miles of road per square mile. These *Forest Service roads* or *National Forest System Roads* are the roads for which the agency has authority to improve, maintain, and control use.

Roads included in the NFGT’s transportation network are classified as *arterial*, *collector* or *local roads*. Arterial roads are National Forest System roads, U.S. and state highways serving large land areas and providing primary travel routes for business, commerce and for national defense. Collector roads serve smaller land areas, collect traffic from local roads, and usually connect to an arterial road. Local roads serve limited areas or sites and generally connect terminal facilities with collector or arterial roads. Components of the existing Forest Service jurisdiction transportation network by functional classification are displayed in Table 31.

Table 31. Functional Classification of Forest Service Roads

Jurisdiction	Functional Classification			
	Arterial	Collector	Local	Total
Mileage of Forest Service Roads	29	231	2,276	2,536
Percentage of Forest Service Roads	1%	9%	90%	100%

Forest Service roads vary widely in construction standards, ranging from paved surface to primitive wheel tracks. These roads are constructed and maintained to standards appropriate to their planned uses considering safety, cost of transportation, and impacts on land and resources.

Traffic service levels have been defined for each road, characterizing the degree of service a given road is expected to offer and designating the appropriate vehicle for use. Table 32 displays roads by traffic service levels for all National Forest System Roads.

Table 32. Traffic Service Level

Traffic Surface Level	Miles	Percentage
A – Free Flowing Mixed Traffic	20	1%
B – Congested During Heavy Traffic	76	3%
C – Flow Interrupted / Use Limited	578	23%
D – Slow Flow or May Be Blocked	1,862	73%
Total	2,536	100%

Roads in the national forests and national grasslands are maintained as required to assure that planned service levels and user safety are preserved and that impacts to soil and water resources are minimized. Utilizing the annual road maintenance and prescription process, road maintenance needs are identified and cost estimates are prepared. Through the road maintenance planning process, including district interdisciplinary team meetings, priorities are determined and negotiated based upon available funding levels. Each road is assigned a *maintenance level* (1–5) based on road use objectives.

Roads in maintenance level 1 are closed to vehicular traffic and receive custodial maintenance only, primarily for resource protection. Maintenance level 2 roads receive minimum maintenance for limited passage of traffic; for example, high-clearance vehicles such as pickups. These roads are normally unsuited for passenger cars. Based on established priorities, roads in maintenance levels 3, 4 and 5 receive routine work to assure safety and travel efficiency. All types of vehicles use these roads, including those with low clearance, such as passenger cars.

The transportation system on the National Forest and Grasslands in Texas is maintained primarily through service / construction contracts with local contractors. Table 33 displays the miles of Forest Service roads by maintenance level.

Table 33. Operational Maintenance Level

Maintenance Level	Miles	Percentage
1 – Basic Custodial Care (Closed)	965	38%
2 – High Clearance Vehicles	797	31%
3 – Suitable for Passenger Cars	658	26%
4 – Moderate Degree of User Comfort	83	3%
5 – High Degree of User Comfort	33	2%
Total	2,536	100%

The NFGT maintains close working relationships with the counties containing national grassland and national forest lands, for development, maintenance, and operation of selected roads of mutual need. This is accomplished through a Forest Development Road (FDR) Cooperative Agreement.

Certain public roads under state or county jurisdiction, which serve the mutual transportation needs of the public and the Forest Service, may be designated as *forest highways*. Once designated, these roads become eligible for Federal Highway Administration rehabilitation and reconstruction funds, including bridge replacement. Formal concurrence by the Texas Department of Transportation and Development, the Federal Highway Administration, and the Forest Service is required to designate any

potential public road as a forest highway. Currently, 38 Forest Service jurisdiction roads with a total length of 115 miles have been designated as forest highways.

Commercial use of Forest Development Roads is prohibited without a permit or authorization. Commercial users are responsible for making deposits or performing maintenance commensurate with their use.

b. Factors Influencing Conditions and Trends

Transportation management objectives are to plan, develop, and operate a network of roads that provide user safety, convenience, and the efficiency to accomplish the NFGT's land and resource management objectives.

As long as the National Forest and Grasslands in Texas remain managed as federal lands, an effective system of roads would be required to meet public demand and permit agency managers to care for the land. For any road, regardless of type, that is determined to be needed as a permanent facility, periodic improvements would be made as required and road maintenance activities would continue. The development, management and operation of the Forest Service Road System would continue as needed to respond to resource management objectives.

The NFGT's collector road component is in place. There are no plans to construct additional roads in this functional class. To assure that the continuing need for transport and mobility is met, collector roads would require a high degree of reconstruction and maintenance attention in the future. Existing local roads would continue to be developed, improved, maintained and managed as required to meet the demand for limited or intermittent access. In areas where no suitable access exists, minimum design-standard roads would be constructed as required and planned. Where existing permanent roads are causing adverse impacts to the adjacent environment, efforts to relocate or stabilize them would be undertaken.

Over the past five-year period, the National Forest and Grasslands appropriated road maintenance funding has fluctuated (see Figure 9), while costs of contract road maintenance and administration have increased. Between 2003 and 2005, dollars increased 43 per cent including supplemental road maintenance funding. In 2006, funding was heavily influenced by Hurricane Rita. Between 2006 and 2008, funding decreased by 55 percent, bringing funding in line with 2003 and 2004 levels. At the same time, supplemental road maintenance funding was discontinued. Forest Road Maintenance deposits have been used to supplement funding. Road maintenance deposits are funds set aside and deposited with the Forest Service for access by timber purchasers, oil well companies etc. As appropriated funding decreased, the NFGT has had to rely on deposited funds in order to maintain roads to standard in the light of the increasing cost to maintain roads. Current funding is insufficient to maintain all roads to 100 percent of operation and maintenance objectives. Over this time period, the NFGT has fully maintained approximately 86 percent of its maintenance level 3, 4, and 5 roads, and 9 percent of level 2 roads. Long-term funding trends may require that appropriated funds from benefiting resources be used to maintain a greater share of the road system. Greater portions of the road system may be placed in lower maintenance levels with more roads closed to vehicular traffic.

Bridges and large drainage structures would be inspected on a routine basis and, would be rehabilitated, replaced, or closed as required to assure user safety.

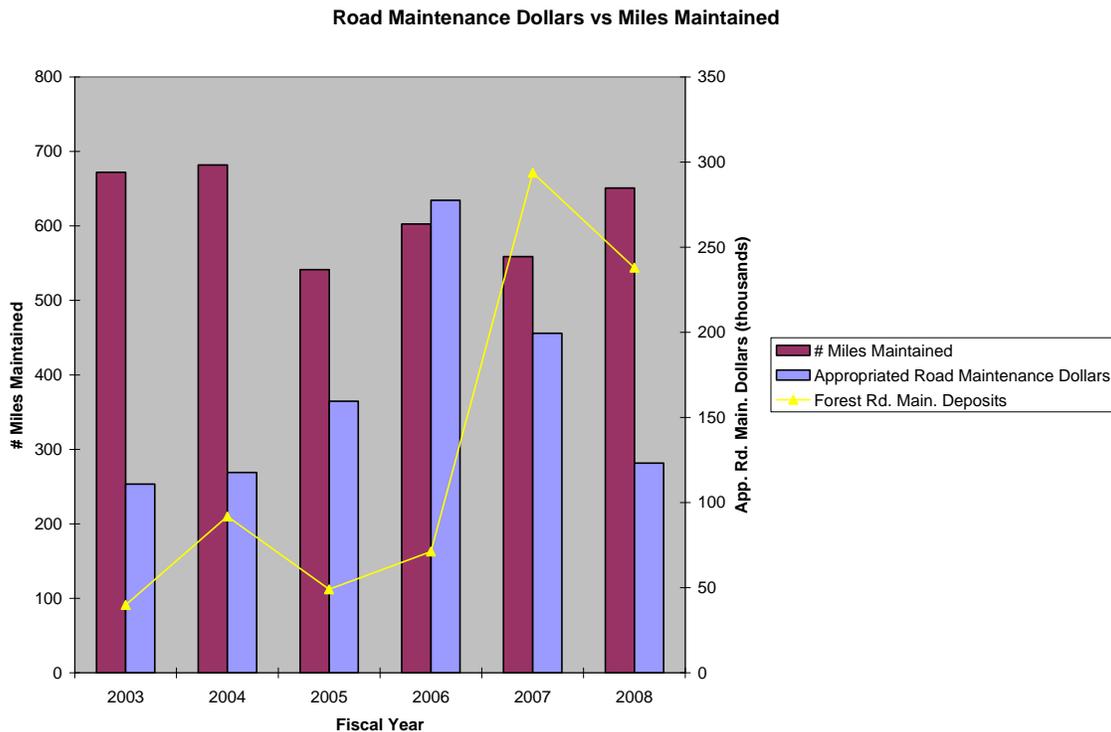
All roads would continue to be inventoried and decisions made about their intended uses. Road management objectives have been developed for each individual road. Based on the desired future condition, certain roads may be:

- Obliterated, allowing the land to be reclaimed for natural resource uses.
- Closed for long periods of time.
- Restricted to use during certain periods or to certain vehicle types.
- Managed as open to all users.

Traffic management methods, such as road closure devices, orders issued restricting or prohibiting use, signing, and law enforcement efforts would be applied to roads according to their intended use and the safety of users.

Through cooperative agreements, the Forest Service would continue to participate with other agencies or local governments to accomplish work on roads of mutual benefit.

Figure 9. Road Maintenance Funding



c. Reasonably Foreseeable Events Outside Agency Control

Road maintenance is primarily accomplished using appropriated funding. Over the past several years, there has been a continued decline in the funding levels for road maintenance. Adjusting for inflation, the decline is even more significant. Future funding

for the National Forests and Grasslands in Texas is expected to continue to decline as a result of a change in the allocation criteria for road maintenance. The NFGT's reliance on Road Maintenance Deposits to supplement appropriated funding is based on deposits available at the beginning of the year. Those funds are decreasing.

While budgets have continued to decline, there has been a significant increase in road maintenance costs in recent years. The demand for materials, equipment and labor has increased dramatically. There has also been a worldwide increase in the demand for construction and maintenance materials, resulting in increased costs of road maintenance.

With the reduced funding levels and increased costs of road maintenance, the miles of roads 'maintained to standard' for all maintenance levels will continue to decrease. Consideration will be given to reducing the number of miles in the transportation system that are maintained for passenger car use.

9. Collaboration

a. Existing Conditions and Trends

Cooperative Relationships

Several partnerships were developed to increase the effectiveness of the NFGT botanical program. Partnerships were developed with The University of North Texas, Bog Research, San Jacinto River Authority, The Nature Conservancy, and Azimuth Forestry that resulted in several projects being completed. Among these were Challenge-Cost Share agreements to re-establish a native legume on the LBJ National Grassland (NG), to complete a floristic inventory of Fox Hunters Hill (a Texas Natural Heritage Area) on the Sabine NF, establishing a native plant materials production area on Clymer Meadow Preserve on the Caddo NG in partnership with The Nature Conservancy, and several smaller contracts that resulted in the completion of additional Threatened and Endangered Species survey work.

The Regional Zone Air Resource Specialist collaborated with Texas Commission on Environmental Quality (TCEQ) on a prescribed fire project on the Sam Houston National Forest to mitigate impacts to air quality in the metropolitan Houston ozone non-attainment area.

The NFGT is working in partnership with Texas Parks and Wildlife and Trails Unlimited (a Forest Service Enterprise Team) to examine areas of the NFGT having suitability for developed trails. The process will involve using GIS technology and existing information on sensitive resources to filter out areas with numerous resources concerns and highlight areas with fewer concerns. District employee and Supervisor's Office specialist input will be used to further narrow the areas of potential trail systems noting areas close to rural towns that would benefit from a trail system, proximity to existing recreation and camping areas, and adequate size to merit consideration.

The NFGT works with various individuals and groups to further the awareness of our cultural heritage resources. Several of these have already been mentioned elsewhere in this report. The partnership with Lake Fannin Wilderness Park, Inc. has been successful at restoring this facility to some usefulness. That partnership continues to grow and

prosper, and recently the group was issued a Granger-Thye permit to allow for continued management and improvements funded by receipts from the use of the complex.

Texas Friends of Passport in Time (TFPIT) came into existence with the express purpose of providing labor and monetary support to the Forest's Passport in Time program. Passport in Time is a volunteer initiative which allows amateur and avocational archeologists to work alongside archeological and historic preservation professionals in the Forest Service on projects which are beneficial and critical to the successful management of heritage resources. TFPIT has contributed funds to support analyses that could not be possible if the NFGT were to rely on appropriated dollars. In addition, they have provided some financial support to the purchase of equipment for Lake Fannin. Since 2002, PIT volunteers have contributed in excess of 10,000 hours of time towards historic preservation programs on the NFGT.

The NFGT continues to have a healthy and productive partnership with the Lake Fannin Wilderness Park volunteer group. Based in Fannin County, this group is providing invaluable assistance in the stabilization and restoration of the Lake Fannin Organizational Camp, a listed National Register of Historic Places property on the Caddo NG, Fannin County, Texas. To date, five cabins have been completely stabilized. The lodge and caretaker's residence have been restored and refurbished so that they are functional buildings – there is a caretaker living in the residence, and the lodge has hosted numerous events in the last three years. The latrine and bathhouse have experienced some stabilization, but more work remains to be done before they too can become completely functional again. A Granger-Thye permit for operation and maintenance has been issued to the Lake Fannin Wilderness Park group, and their future involvement in the maintenance and management of Lake Fannin seems assured.

Heritage Resource management staff have been active participants in local, state, and national efforts to promote historic preservation and cultural resource management. Numerous presentations to civic clubs and school groups have increased public awareness of heritage resource management issues. Staff members have made numerous professional presentations to local and regional archeological societies, as well as at national and international level symposia.

The NFGT works in collaboration with the following organizations, universities, and agencies on various recreation and forest management issues:

National Wild Turkey Federation (NWTF)
Texas Parks and Wildlife Department (TPWD)
Lake Fannin Wilderness Parks of Texas, Inc.
Natural Resources Conservation Service (NRCS)
Fannin Soil & Water Conservation District
Caddo Trail Riders
Texas Arabian Distance Riders Association
(TADRA)
Friends of the Grasslands
Lake Fannin Wilderness Park, Inc.
Wise County Soil & Water Conservation District
Houston Chapter of the Sierra Club
Texas Conservation Alliance

Blue Ribbon Coalition
Greater Houston Off-Road Biking Association
Lone Star Hiking Trail Club
The Nature Conservancy
Texas Forest Service
Texas A & M University
Boy Scouts of America
Audubon Society
San Jacinto River Authority
Trails Unlimited Enterprise Unit
Gulf Coast Trades Center
Sam Houston State University
Stephen F. Austin State University (SFA)

U.S. Fish and Wildlife Service (USFWS)
 Angelina College
 Friends of the National Forests and Grasslands in
 Texas
 Angelina Forest Trail Riders
 Dallas Off-Road Bicycle Association

University of North Texas
 Golden Triangle Chapter, Sierra Club
 Lone Star Chapter, Sierra Club
 International Mountain Biking Association
 Texas Motorized Trails Coalition
 Trail Riders of Houston

b. Factors Influencing Conditions and Trends

Declining natural resource budgets make it imperative that the NFGT continues to work with its partners in order to accomplish project work.

c. Projected Future Actions

The Forest Service Planning Rule (36 CFR 219) may change in the near future. Several attempts at revising the Rule have taken place; however, at this time the NFGT is still operating under the 1982 version of the Rule. Changes to this Rule may include: the establishment of an environmental management system (EMS), streamlining the process of developing, amending, or revising a plan; and more explicit collaboration, public participation, and notification methods. Also, in anticipation of forthcoming changes, this report has been formatted so it can also serve as the “Comprehensive Evaluation Report” (CER) if that becomes necessary.

d. Reasonably Foreseeable Events Outside Agency Control

It is likely that ongoing litigation will affect how the forests and grasslands eventually conduct its strategic planning and monitoring activities. At the time of this report, revised national planning direction is being proposed and analyzed.

10. Jobs and Income

a. Existing Conditions and Trends

Table 34 compares some demographic differences between Texas and the rest of the country.

Table 34: Texas vs. National Demographics *		
People	Texas	USA
Population, 2008 estimate	24,326,974	304,059,724
Population, percent change, April 1, 2000 to July 1, 2008	16.7%	8.0%
Population, 2000	20,851,811	281,424,602
High school graduates, percent of persons age 25+, 2000	75.7%	80.4%
Bachelor's degree or higher, pct of persons age 25+, 2000	23.2%	24.4%

Mean travel time to work (minutes), workers age 16+, 2000	25.4	25.5
Table 34: Texas vs. National Demographics *(cont')		
Homeownership rate, 2000	63.8%	66.2%
Housing units in multi-unit structures, percent, 2000	24.2%	26.4%
Median value of owner-occupied housing units, 2000	\$82,500	\$119,600
Persons per household, 2000	2.74	2.59
Median household income, 2007	\$47,563	\$50,740
Per capita money income, 1999	\$19,617	\$21,587
Persons below poverty, percent, 2007	16.3%	13.0%
Business	Texas	USA
Private nonfarm establishments, 2006	509,080	7,601,160
Private nonfarm employment, 2006	8,711,476	119,917,165
Private nonfarm employment, percent change 2000-2006	8.5%	5.1%
Nonemployer establishments, 2006	1,736,997	20,768,555
Total number of firms, 2002	1,734,509	22,974,655
Black-owned firms, percent, 2002	5.1%	5.2%
American Indian and Alaska Native owned firms, percent, 2002	0.9%	0.9%
Asian-owned firms, percent, 2002	4.5%	4.8%
Hispanic-owned firms, percent, 2002	18.4%	6.8%
Women-owned firms, percent, 2002	27.0%	28.2%
Manufacturers shipments, 2002 (\$1000)	310,815,965	3,916,136,712
Wholesale trade sales, 2002 (\$1000)	397,405,111	4,634,755,112
Retail sales, 2002 (\$1000)	228,694,755	3,056,421,997
Retail sales per capita, 2002	10,528	\$10,615
Accommodation and foodservices sales, 2002 (\$1000)	29,914,774	449,498,718
Building permits, 2007	176,992	1,398,414
Federal spending, 2007 (\$1000)	171,765,961	2,536,629,405

Geography	Texas	USA
Table 34: Texas vs. National Demographics *(cont')		
Land area, 2000 (square miles)	261,797.12	3,537,438.44
Persons per square mile, 2000	79.6	79.6
FIPS Code	48	

*Source: US Census Bureau State & County QuickFacts

Table 35 compares 2000 demographic statistics for exclusively the NFGT's economic impact area (east Texas) with the state as a whole.

Table 35: East Texas vs. Texas Economic Characteristics*		
Angelina, Houston, Jasper, Nacogdoches, Newton, Montgomery, Sabine, San Augustine, San Jacinto, Shelby, Trinity, and Walker Counties.	East Texas - December 2000	State of Texas - December 2000
People QuickFacts		
Population, 2008 estimate	794,991	24,326,974
Population, percent change, April 1, 2000 to July 1, 2008	22.4%	16.7%
Population, 2000	649,377	20,851,811
EMPLOYMENT STATUS		
Population 16 years and over	497,550	15,617,373
In labor force	52.3%	63.6%
Civilian labor force	52.3%	62.9%
Employed	48.4%	59.1%
Unemployed	3.8%	3.8%
Armed Forces	0.05%	0.7%
Not in labor force	47.6%	36.4%
Females 16 years and over	248,922	7,960,900
In labor force	47.1%	56.2%
Civilian labor force	47.1%	56.0%
Employed	43.4%	52.3%
COMMUTING TO WORK		
Workers 16 years and over	269,527	9,157,875
Car, truck, or van -- drove alone	77.0%	77.7%
Car, truck, or van -- carpooled	15.9%	14.5%
Mean travel time to work (minutes)	28.6	25.4
Employed civilian population 16 years and over	274,803	9,234,372
OCCUPATION		
Management, professional, and related occupations	25.7%	33.3%
Service occupations	17.5%	14.6%
Sales and office occupations	23.1%	27.2%

Construction, extraction, maintenance, and repair occupations	13.3%	10.9%
Farming, fishing, and forestry occupations	2.5%	0.7%
Table 35: East Texas vs. Texas Economic Characteristics* (cont')		
Production, transportation, and material moving occupations	17.6%	13.2%
INDUSTRY		
Agriculture, forestry, fishing and hunting, mining	6.7%	2.7%
Construction	9.3%	8.1%
Manufacturing	13.1%	11.8%
Wholesale trade	2.8%	3.9%
Retail trade	12.0%	12.0%
Transportation and warehousing, and utilities	5.4%	5.8%
Finance and insurance, and real estate and rental and leasing	4.1%	6.8%
Professional, scientific, and management, and administrative and waste management services	4.8%	9.5%
Educational services, and health care and social assistance	21.2%	19.3%
Arts, entertainment, and recreation, and accommodation and food services	5.4%	7.3%
Other services (except public administration)	5.3%	5.2%
Public administration	7.9%	4.5%
CLASS OF WORKER		
Private wage and salary workers	69.6%	78.0%
Government workers	20.3%	14.6%
Self-employed workers in own not incorporated business and unpaid family workers	10.1%	7.4%
INCOME AND BENEFITS (IN 1999 INFLATION-ADJUSTED DOLLARS)		
Total households	232,037	7,397,294
Less than \$10,000	15.9%	10.4%
\$10,000 to \$14,999	9.2%	6.6%
\$15,000 to \$24,999	16.2%	13.6%
\$25,000 to \$34,999	14.8%	13.5%
\$35,000 to \$49,999	16.3%	16.5%
\$50,000 to \$74,999	15.4%	18.4%
\$75,000 to \$99,999	6.0%	9.5%
\$100,000 to \$149,999	3.7%	7.2%
\$150,000 to \$199,999	1.0%	2.1%
\$200,000 or more	1.3%	2.2%
Median household income (dollars)	31,215	39,927
Mean household income (dollars)	41,911	53,870
Families		
Less than \$10,000	9.1%	7.0%
\$10,000 to \$14,999	6.7%	5.3%
\$15,000 to \$24,999	15.3%	12.3%
\$25,000 to \$34,999	15.8%	12.8%
\$35,000 to \$49,999	18.9%	16.8%
\$50,000 to \$74,999	19.0%	20.5%
\$75,000 to \$99,999	7.6%	11.3%

\$100,000 to \$149,999	4.7%	8.8%
\$150,000 to \$199,999	1.0%	2.5%
Table 35: East Texas vs. Texas Economic Characteristics* (cont')		
\$200,000 or more	1.5%	2.7%
Median family income (dollars)	37,828	45,861
Per capita income (dollars)	16,006	19,617
Median earnings:		
Male full-time, year-round workers (dollars)	30,650	34,925
Female full-time, year-round workers (dollars)	21,132	26,168
NUMBERS OF FAMILIES AND PEOPLE WHOSE INCOME IN THE PAST 12 MONTHS IS BELOW THE POVERTY LEVEL		
All families	18,199	632,676
With related children under 18 years	13,442	503,911
Families with female householder, no husband present	7,996	266,954
Related children under 18 years	6,926	235,353

*Source: US Census Bureau State & County QuickFacts

The population of Texas grew only slightly after Hurricanes Rita (2005) and Ike (2008) and while some of this growth may be attributable to the hurricanes, Texas is a rapidly growing state so the population increase of less than a half percent following the storms is not significant. Nonetheless, few counties in Texas decreased in population following the hurricanes and most counties in the disaster-declared region saw population increases.

Population and employment growth go hand in hand. Population grows because jobs are available, and jobs are created because of available low-cost labor produced by a growing population. If Texas maintains its average employment-to-population ratio as expected during the next 25 years (around 42.7 percent), the state will add another 4.5 to 5.8 million jobs. Job growth is expected to be stimulated by overall U.S. economic growth and enhanced by Texas' employment-friendly characteristics (compared with most other states):

- Ample supply of relatively low-cost, nonunion labor;
- Continued importance of the energy industry along with energy diversification across the state;
- Relatively low business operating costs and taxes;
- Nonobstructive, probusiness state and local business policies; and
- Affordable housing.

Texas' current employment growth is roughly twice the national rate and should continue that pattern over the coming decades, barring any major upheavals. Texas leads the nation in job creation. The Houston and Dallas metropolitan areas lead U.S. metro areas in creating jobs.

b. Factors Influencing Conditions and Trends

Population Growth

Of the social changes underway, population growth will undoubtedly be the most significant in shaping the future of the South's wildland-urban interface. In April 2000, the population of the United States was estimated to be 281,421,906. Of that number, 91,486,129 lived in the 13 state region from Virginia to Texas (Table 36). Between April 1, 1990 and April 1, 2000, this region's population grew 13.9 percent and now accounts for 32.5 percent of the national total. The South's population is increasing to relative to the populations of other regions.

Table 36. Population of most heavily populated Southern States, the South, and the United States, 2000.

State/Area	Million ¹
Texas	20.9
Florida	16.0
Georgia	8.2
North Carolina	8.0
Virginia	7.1
South	91.5
United States	281.4

¹Source: U.S. Department of Commerce, Bureau of the Census 2000.

Migration to the South from other regions of this country is highly significant. In 1981, 1.47 million people moved in to this region from other parts of the United States, while approximately 1 million moved out. The net increase was 470,000. People moving into the South from abroad that year totaled 401,000 making a legal net gain of 871,000. In 1998, net internal migration totaled 271,000, while movers from abroad totaled 544,00. The South's net gain, excluding illegal immigration, was 815,000. That total was greater than the totals across all other U.S. regions combined. With migration pressures of this magnitude, mostly to already burgeoning metropolitan areas like Houston and Dallas-Fort Worth, former rural areas and forests are being converted to urban interface zones at unprecedented rates.

A highly significant outcome of population aging is the unprecedented increase in the number of retirees. The overall regional increase was 25.7 percent. The most rapid increases were in most of Florida, along the Atlantic coast, down the Southern Appalachians to Atlanta, along the Gulf Coast, and in eastern Texas. Over the region, the percentage of the population age 65 and over is projected to continue to rise from about 12.5 percent in 2000 to over 17 percent by 2020 (Woods and Poole Economics, 1997). This increase is likely to have profound effects on forest ecosystems. It means continued development of retirement communities, second homes, and recreation facilities like golf courses, all of which lead to the creation of new interface areas. It also means more

potential for interactions between interface residents and forest management practices, such as fire, recreation, and timber management (Marcin 1993).

Increasing ethnic diversity is another primary component of social change in the South. The makeup of the population is shifting rapidly. In the 1990s, non-Hispanic whites made up approximately 72.4 percent of the region-wide population. Of minority populations, Hispanic residents made up 8.9 percent, Blacks made up 16.7 percent, and Asian and other races made up just over 2 percent. The trends now are similar in the south to those in the rest of the United States. Non-Hispanic whites are steadily becoming a smaller percentage of the total population. Research has shown that Whites, Blacks, Hispanics and Asians, and others differ in how each uses and values southern forests and other natural resources (Cordell et al., in press). Resulting changes in collective public positions on natural resource management and protection will likely end up being the social trend with the greatest impact on how we collectively view and use forests.

C. Evaluation of New Information

1. Emerging Issues

Below is information about lawsuits affecting the NFGT. Action has been taken to address and/or adhere to final rulings that have been issued, and lessons learned while continuing litigation support efforts are taken into consideration when planning new projects for implementation of *Plan* objectives.

(1) NFGT Litigation

Sierra Club, et al v. Jacobs, et al in the U.S. District Court, Southern District of Texas, Houston Division

In a lawsuit filed in 2004, Plaintiffs cited four complaints alleging the Forest Service violated the APA (Administrative Procedures Act) in Count 1, the NFMA (National Forest Management Act) in Count 2, NFMA again and Forest Plan requirements in Count 3, and the NEPA (National Environmental Policy Act) in Count 4. The lawsuit enjoined two decisions to improve forest health conditions by commercial thinning on portions of the Sam Houston NF.

In 2005, Plaintiffs prevailed in a ruling issued by the District Court regarding Counts 3 and 4. After an evidentiary trial in December 2006, the court ruled in favor of the government by dismissing Plaintiffs' claims on Counts 1 and 2.

Both parties appealed the District Court's rulings to the Fifth Circuit Court of Appeal and the matter was scheduled for non-binding mediation. Both projects named in the suit remain enjoined while proceedings continue.

Audie Apple v. USA in the U.S. District Court, Eastern District of Texas, Sherman Division

Plaintiff Audie Apple filed a lawsuit claiming possession of an approximate 24-acre tract (called Tract 18) of land located on the Caddo Grasslands Unit in Fannin County, Texas during January 2006. His petition included claims for damages such as for the death of a

registered longhorn bull and the cutting of cedar trees when a new fence was built by the government around Tract 18.

The government responded that it has clear title to the land in question and that the damages claimed by Mr. Apple are not valid. In February 2007, the case was referred to non-binding mediation. Although a settlement conference was attended by all parties, by the end of the fiscal year motions were filed by both parties to reinstate the case to the trial docket.

(2) National Forest System Litigation Affecting the NFGT

Roadless Area Management

On November 29, 2006, the U.S. District Court for the Northern District of California issued a clarifying order to its September 20, 2006 decision in the consolidated cases California v. USDA and Wilderness Society v. USFS. The September decision enjoined the 2005 State Petitions Rule and reinstated the 2001 Roadless Rule (including the Tongass Amendment). On September 22, 2006, a letter was issued from the Forest Service office in Washington that informed all units that all projects in inventoried roadless areas referred to by the 2001 Roadless Area Conservation Rule (with exception of the Tongass NF) must immediately comply with the court's order. The court's November order clarified the scope of the injunction.

The Washington direction included language from the court's order which stated:
“[The Forest Service] is enjoined from taking any further action contrary to the Roadless Rule without first remedying the legal violations identified in the Court's opinion of September 20, 2006. Such further actions by the Forest Service include, but are not limited to, approving or authorizing any management activities in inventoried roadless areas that would be prohibited by the 2001 Roadless Rule (including the Tongass Amendment), and issuing or awarding leases or contracts for projects in inventories areas that would be prohibited by the 2001 Roadless Rule, including the Tongass Amendment. The effective date of this injunction is September 20, 2006.

The 2001 Rule established prohibitions to road construction/reconstruction and timber harvest in areas identified in the 2000 Roadless Area Conservation FEIS, Volume 2. There were certain exceptions. The entire 2001 Rule and preamble are found in the Federal Register on January 12, 2001 (66 FR 3244).

Hazardous Fuels Reduction Categorical Exclusion

On December 5, 2007, the U.S. Ninth Circuit Court of Appeals declared the hazardous fuels reduction categorical exclusion (HFRCE) developed under the President's Healthy Forests Initiative invalid. It also indicated that the U.S. Eastern District of California Court should issue an injunction against further use of the HFRCE and determine which activities approved after October 8, 2004, under the HFRCE should be enjoined.

The Circuit's ruling does not extend to other categorical exclusions.

While the Court's order did not immediately enjoin use of the HFRCE, the Forest Service has refrained from issuing new decisions and refrained from advertising or awarding contracts to implement decisions made after October 8, 2004 that were approved under the HFRCE.

Wilderness Society v. Rey

The NFGT is continuing compliance with the April 2006 court order from the U.S. District Court in Montana that enjoined the agency from enforcing 36 CFR 215.13(a) [which provides, among other things, that only those who submit substantive comment on a Forest Service project will be eligible to appeal the project decision] and puts back into effect the previous regulation at 36 CFR 215.11(a).

Earth Island Institute v. Ruthenbeck

During 2005, the Federal District Court for the Eastern District of California ordered that ten categories of categorically excluded timber sales are subject to notice, comment and appeal under 36 CFR 215 rules. The NFGT ensures it is abiding by this court's ruling.

2. Changes in National or Regional Policy/Direction

Four basic levels of planning guide the overall management of national forests and grasslands:

1. *Strategic planning* which takes place at the highest level and identifies strategic priorities for the agency that are implemented over a period of time through annual agency budgets. The strategic priorities are based on national assessments of natural resources and are responsive to social and political trends.
2. *Business planning* by national programs, regions, research stations, and the northeastern area which translates broad strategic direction into regionally specific work that contributes to the agency's mission.
3. *Unit planning* (i.e. the NFGT Revised Forest Plan) which provides an inventory of resources and their present conditions on a particular management unit. This inventory, coupled with the desired future condition for the resources, is the basis for annual work planning and budgeting.
4. *Annual work planning* which identifies the projects that units propose for funding within a fiscal year. This level of planning involves the final application of strategic direction into a unit's annual budget to move its resources toward its desired future condition.

Over the course of Plan Revision development and implementation, there have been numerous changes in national and regional policy and direction.

The Government Performance and Results Act (1993), was enacted to improve Federal program effectiveness and public accountability by promoting a new focus on results, service quality, and customer satisfaction, still significantly influences the management of national forests.

Administrative procedures and processes governing preparation of projects to reduce hazardous fuels and restore healthy ecological conditions on Federal land have also

undergone changes. In 2002, the *Healthy Forests Initiative (HFI)* was established to reduce administrative process delays to the implementation of projects. The *Healthy Forests Restoration Act (HFRA)* was passed in December 2003 and was primarily intended to provide improved statutory processes for hazardous fuel reduction projects on certain types of at-risk National Forest and Bureau of Land Management lands.

In April 2003, former FS Chief Dale Bosworth described his concept of the *Four Threats to the Health of the Nation's Forests and Grasslands*. The *USDA Forest Service Strategic Plan for Fiscal Years 2004-2008* provided a new framework for accomplishing the agency's mission and incorporated actions to resolve the Four Threats. Forest Service leadership, through the implementation of the Strategic Plan, became committed to removing the Four Threats from the national landscape.

Actions described to address the Four Threats included:

Fire and fuels—Restore healthy, disturbance-resilient ecosystems on lands at risk from catastrophic fire, improving the condition and function of critically important watersheds, and sustaining critical wildlife habitat nationwide.

Invasive species—Protect forest and rangeland ecosystems by preventing the release of non-native species and by controlling the spread, or eradicating, invasive species.

Loss of open space—Conserve the nation's forests and rangelands most at risk due to subdivision and land conversion by working with partners, communities and landowners to balance development with sustaining ecosystem services and viable working landscapes.

Unmanaged recreation—Work with partners to develop travel management plans that regulate the use of off-highway vehicles on designated roads, trails, and parks in an appropriate manner.

Forest Service Chief Abigail R. Kimbell re-enforced the national commitment to reducing the Four Treats in the USDA Forest Service Strategic Plan FY2007–2012 issued in July 2007. The national strategic goals and objectives for fiscal years 2007–2012 are:

1. Restore, sustain, and enhance the Nation's forests and grasslands.
2. Provide and sustain benefits to the American People.
3. Conserve Open Space.
4. Sustain and Enhance Outdoor Recreation Opportunities.
5. Maintain Basic Management Capabilities of the Forest Service.
6. Engage Urban America with Forest Service Programs.
7. Provide Science-Based Applications and Tools for Sustainable Natural Resources Management.

Prior to the injunction on the 2005 planning rule, executive order E.O.13423 required all federal agencies to develop and implement an Environmental Management System (EMS). The Forest Service, in the 2005 Planning Rule, required use of an EMS for each unit of the National Forest and Grasslands system as a primary management approach for addressing environmental aspects of its operations and activities. In accordance with the E.O.13423, the Forest Service continues development of an EMS.

The issuance of the 2005 National Travel Management Rule has had a significant impact on the management of the Forest. The local decision prohibiting cross-country and designating which roads and trails will be open to public motor vehicle use will be issued in 2008.

Regional changes to policy or direction resulted from the issuance of the 2003 revision of the U.S. Fish and Wildlife Service's Red-cockaded Woodpecker Recovery Plan. This resulted in Forest Plan Amendment #7 in April 2006.

3. Annual Budgets for FY 2003 to FY2007

Table 37 shows the annual fluctuation in budgets by Budget Line Item from 2003-2007.

Table 37. EXPENDITURES FOR FY2003-FY2007

PROGRAM	DESCRIPTION	2007	2006	2005	2004	2003
C MDF	CONSTRUCTION SUPPLEMENTAL DISASTER FUND	889,117	1,797,036			
CMEX	CONSTRUCTION EXTERNAL REIMBURSABLE	124,498				
CMFC	FACILITIES CAPITAL IMPROVEMENTS & MAINTENANCE	914,421	398,334	963,070	2,669,722	1,022,007
CMII	CONSTRUCTION INFRASTRUCTURE AND IMPROVEMENT		254,987	9,077	372,276	67,355
CMRD	ROADS CAPITAL IMPROVEMENTS & MAINTENANCE	782,692	1,261,425	1,839,364	1,500,571	1,150,532
CMTL	TRAILS CAPITAL IMPROVEMENTS & MAINTENANCE	310,437	269,890	273,150	129,832	143,890
CP09	FACILITIES ASSESSMENT	160,686	165,322			
CWF2	CO-OPERATIVE WORK NON-AGREEMENT BASED	331,644				
CWFS	COOPERATIVE WORK, OTHER	316,081	374,972	278,784	533,623	499,438
CWKV	COOPERATIVE WORK, KNUTSEN-VANDENBERG FUND	1,806,395	683,978	1,472,432	2,194,018	1,320,480
CWK2	KV REGIONAL PROJECT	1,966,003	1,888,685			
EXEX	LAND EXCHANGE	149,575	33,000	150,780	224,535	0
EXSC	CONVEYANCE OF ADMIN SITES	26,829	14,902			
FDCL	FEE DEMO COLLECTION SUPPORT	58,704	50,357	46,453	37,771	22,876
FDDS	FEE DEMO SITE SPECIFIC	315,309	232,065	306,933	234,758	227,608
FEFR	RECREATION FEE COLLECTION				300	794
GBGB	GIFTS AND BEQUESTS					1,381
HTAE	FEDERAL HIGHWAY ADMIN EXPENSE		9,124	4,962	10,997	11,000
HTAP	FEDERAL HIGHWAY AQUATIC PASSAGE	6,628	184,111			
HTRP	FEDERAL HIGHWAY PUBLIC ROADS					14,816
LALW	LAND ACQUISITION MANAGEMENT/LAND PURCHASE	3,262	13,873	17,681	5,157	39,441
MSEQ	ADMINISTRATIVE MAPS		462			

Table 37. EXPENDITURES FOR FY2003-FY2007 (cont').

MVIS	MAPS FOR VISITORS & OTHER REC	28,043	16,444	12,991	2,510	10,108
NFCC	VEG TREATMENTS TO IMPROVE CONDITIONS					106,935
NFDD	SUPPLEMENTAL DISASTER FUND	4,239	6,914,714			
NFEE	EMERGENCY SUPPLEMENTAL		42,617	6,625		
NFEX	NATIONAL FOREST SYSTEM EXTERNAL REIMBURSABLE				136,554	56,180
NFIM	INVENTORY AND MONITORING	362,948	330,096	387,447	325,052	595,038
NFLM	LANDOWNERSHIP MANAGEMENT	308,847	217,833	234,686	314,228	367,235
NFMG	MINERALS & GEOLOGY MANAGEMENT	499,350	590,959	364,430	428,723	333,932
NFN3	REHABILITATION AND RESTORATION			6,725		
NFPN	LAND MANAGEMENT PLANNING	97,448	37,730	98,761	27,595	110,752
NFRG	GRAZING MANAGEMENT	88,392	114,432	102,213	220,362	162,166
NFRW	RECREATION, HERITAGE, WILDERNESS	1,042,300	1,157,467	1,066,495	718,520	873,602
NFSA	SCSEP			389,378		404,772
NFSD	SCSEP	35,171	479,211			104,954
NFTM	TIMBER SALES MANAGEMENT	1,008,585	2,135,213	1,712,691	1,417,523	1,544,452
NFVW	VEGETATION AND WATERSHED MANAGEMENT	215,042	390,309	317,107	521,477	439,610
NFWF	WILDLIFE AND FISHERIES HABITAT MANAGEMENT	620,237	683,205	630,118	590,806	775,441
NFXF	NFS FEDERAL EXTERNAL REIMBURSABLE	200,000		432		
NFXN	NFS NON-FEDERAL EXTERNAL REIMBURSABLE			28,995		
PSCP	PAYMENTS TO STATES- COUNTY PROJECTS		82,125	4,070		
PSRS	TITLE II FUNDING	243,147	675,403	3,236		
QMQM	OPERATIONS & MAINTENANCE OF QUARTERS	19,817	77		1,777	2,093
RIRI	RESTORATION OF FOREST LANDS				0	1,255
RTRT	REFORESTATION TRUST FUNDS	131,829	41,752	87,019	131,085	219,143
SPEA	ECONOMIC ACTION PROGRAM			3,289	1,000	8,673
SPFH	FOREST HEALTH	347,327	306,205	352,826	409,991	
SPIA	FOREST RESOURCES INFORMATION & ANALYSIS				425,000	
SPS4	FEDERAL LANDS, TITLE IV					16,908
SSSS	TIMBER SALVAGE SALES	311,682	704,922	167,660	14,031	9,104
TPCD	RECREATION BACKLOG/TIMBER PIPELINE	90,317	61,449	59,000		
TPPS	TIMBER SALES/TIMBER PIPELINE	16,384	25,704	408,885	141,685	267,534
TRTR	ROADS AND TRAILS FOR STATES	244,600	200,793	86,658	344,061	75,605

Table 37. EXPENDITURES FOR FY2003-FY2007 (cont').

WCCS	COMPUTER SERVICE					235,401
WCFE	FLEET EQUIPMENT					986,489
WFHF	HAZARDOUS FUELS REDUCTION	2,502,841	1,829,584	1,829,583	2,614,817	851,771
WFPR	WILDLAND FIRE, PREPAREDNESS	1,677,268	1,446,582	1,405,030	1,384,545	884,180
WFSU	FIRE OPERATIONS	119,985		9,561,826		114,855
WFXN	WF NONFED EXTERNAL REIMBURSABLE	869		31,011		
TOTAL		18,378,949	26,117,349	24,721,873	18,084,902	14,079,809

V. List of Preparers

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