

Chapter II. Monitoring Results, Findings & Evaluation

A. Ecosystem Condition, Health & Sustainability

Sub-Issue 1. Biodiversity

Below are the NFMA elements for this sub-issue.

- Determine if the regeneration of desired tree species are being achieved (36 CFR 219.27(b)(6)).
- Determine if the vegetation is being managed according to the Plan's requirements and making progress toward achievement of the DFCs for vegetation. (36 CFR 219.15 and 219.27).
- Determine if the desired diversity of plant and animal communities is being achieved (36 CFR 291.26, 219.27(a)(5) and (g)).
- Determine if the habitat for Management Indicator Species is being maintained and improved to the degree consistent with the objectives established in the Forest Plan (36 CFR 219.27(a)(6)).
- Monitor the population trends of the Management Indicator Species, and their relationships to habitat changes (36 CFR 219.27(a)(6)).
- Determine the progress towards recovery objectives for T&E species and conservation objectives for sensitive species [36 CFR 219(a)(7)].

Vegetation Management

Grasslands

Species or Issue: *Cedar.*

Findings: Eastern red cedar is an encroaching species on the Caddo and Lyndon B. Johnson (LBJ) National Grasslands (NGs). During FY 2002, no acres were treated on the Grasslands for this problem. Approximately 610 acres had been planned for treatment on the LBJ NG; however, a contract was not awarded because of wildland fire priorities in the western United States.

Approximately 1,609 acres of Grasslands were treated for encroaching eastern red cedars in 2003. On the Caddo NGs, 999 acres were treated and on the LBJ NGs, 610 acres were treated. This work was completed in areas of the Urban Wildland Interface. (Note: For a definition of Urban Wildland Interface, see the explanation later in this Chapter under **Issue B. Sustainable Multiple Forest and Range Benefits, Sub-Issue 3. Human Influences.**)

Red cedars [over 4 feet in total height and less than 14 inches at diameter breast height (dbh)] were severed by chainsaw or by mechanical shear. The felled cedar will act as brush cover for various birds and mammals for about one year until the desiccated needles fall off. Then it will be treated with prescribed fire.

Evaluation: The Grasslands unit continues to encourage reversion of areas back to a desired grassland landscape with hardwood woodlands.

Forests

Species or Issue: *Age Class.*

Findings: A comparison of age classes between 1992 (the baseline year used in *Plan* development) and 2002 using the Continuous Inventory of Stand Conditions (CISC) database was done to determine changes that have occurred (see Appendix G.) Close examination of these tables reveals a general aging trend throughout the forest. The tables show that in 1992 there were 210,658 acres of forest over 70 years old (35 percent of the forest) compared to 327,252 (54 percent of the forest) by 2002, an increase of 55 percent in eleven years. This trend is seen in both pine and hardwood forest types.

The same methods of comparison of age classes were used for data from 1992 through 2003. Examination of the tables compiled for Appendix G support earlier conclusions that a general aging trend is occurring throughout the forest. By 2003, the amount of forest over 70 years of age increased to 338,797 acres. This trend is once again seen in both pine and hardwood stands.

The tables also show that only three percent of forest land is within the 0-10 year age class (18,857 acres), while seven percent (44,857 acres) is over 100 years old. Two ten-year age classes contain 38 percent of the total forest lands: the 71-80 year class (121,626 acres) and the 81-90 year class (112,622 acres).

Evaluation: Younger age classes are not being created at the rate anticipated in the *Plan*. This prevents the forest from meeting *Plan* habitat and age-class objectives. Continued aging of the forest and lack of young regeneration will create forest health problems and can contribute to significant Southern Pine Beetle (SPB) hazard.

Species or Issue: *Regeneration Checks.*

Findings: Use of Plantation Evaluation and Performance (PEP) and CISC databases indicate that for 2002 and 2003 no stands failed to meet the five-year stocking requirement under the NFMA.

Third year checks done on 183 acres in 2002 showed that 53 percent (or 97 acres) met minimum stocking standards when only planted seedlings were counted. However, when natural seedlings are included, 79 percent (or 145 acres) met minimum stocking standards. Survival was severely impacted by the summer of 2000 drought, when only 1.24 inches of rain fell in July and August.

Third year checks done on 619 acres in 2003 showed that 96 percent (594 acres) met minimum stocking standards. One 60-acre stand originally scheduled for a third year check in 2003 was replanted in 2002; therefore, a third-year check was not done for this stand in 2003.

The following is a summary of the first year regeneration checks done in 2002 and 2003:

Angelina NF

The Angelina NF did not have any first year regeneration checks to complete in 2002.

First-year survival exams were done in 2003 to insure previous year's plantings survived and were at adequate levels in Compartment 1 (longleaf Stand 3), Compartment 2 (longleaf Stands 1 and 12), Compartment 3 (longleaf Stands 1 and 10 and shortleaf Stands 4 and 8), Compartment 4 (longleaf Stand 24), and Compartment 5 (longleaf Stand 2). All stands were determined to meet or exceed the minimum required stocking level, with survival ranging from 52 to 84 percent.

Davy Crockett NF

The Davy Crockett NF planted seedlings in Compartments 52 (Stand 1), 88 (Stand 16), 101 (Stand 20), and 110 (Stand 32) during FY 2001. Each of these compartments are within MA-1 (Upland Forest Ecosystem). Since the *Plan's* DFC for MA-1 is open pine forest with longleaf savanna communities on ridges and upper slopes, containerized longleaf seedlings were planted.

The regeneration areas in Compartments 52 and 88 were the result of wildland fires that killed the overstory. Compartment 52 required no additional site preparation before planting, but Compartment 88 was sheared. Compartment 101 was a replant of a plantation failure. Compartment 110 was a planned regeneration harvest. Seedlings were examined and no evidence of disease or damage was noted.

These areas were examined during FY 2002 for first year survival, but all of them failed. However, three of the stands have adequate natural regeneration, and only one stand (Compartment 88, Stand 16) will be replanted.

The Davy Crockett NF did not have any first or third year survival checks to do in 2003.

Sam Houston NF

During 2002, first year survival checks were conducted on the Sam Houston NF after planting bare root shortleaf pine seedlings in Compartments 23 (Stand 14) and 33 (Stand 8). District personnel sampled 1/100th-acre plots across 83 acres within these stands. Both compartments lie within MA-2 (RCW emphasis) and the DFC is open pine forest with some hardwood species, with a focus on management and restoration of older forest conditions and communities. The checks revealed inadequate shortleaf pine stocking, and further treatments will be necessary.

In 2003, first year survival checks were conducted after planting bare root loblolly pine seedlings in Compartments 23, 33 and 84. Sampling of 1/100th-acre plots across 120 acres within four stands was accomplished. Compartments 23 and 33 lie within MA-2, and Compartment 84 is within MA-1. The checks revealed adequate loblolly pine stocking in all four stands. No cultural treatments were needed or recommended at the time. Areas will be re-examined in two years.

Sabine NF

The Sabine NF did not have any first year regeneration checks to complete in 2002.

First year survival checks were conducted in 2003 on 520 acres in Compartment 55 (shortleaf Stand 13), Compartment 62 (longleaf Stand 24 and shortleaf Stands 5, 9, 14, and 17), and Compartment 65 (longleaf stands 16, 24, and 27). Compartments 55 and 62 lie within MA-2, and Compartment 65 is within MA-1. Only four stands (Compartment 62 Stand 9 and Compartment 65 Stands 16, 24, and 27) had adequate stocking after the first year; the other stands will likely need remedial treatments in order to obtain sufficient regeneration.

Evaluation: Losses in regeneration areas causes delays in obtaining stocking of desired vegetation. Costs increase because additional site preparation and replanting are needed. The forest will have to re-program reforestation efforts in these areas.

Species or Issue: *Precommercial Thinning and Release.*

Findings: Precommercial thinning and release treatments were conducted over 491 acres during FY 2002 on the Angelina and Sam Houston NFs.

These areas were excessively stocked with pine and hardwood seedlings and saplings

prior to treatment; growth was starting to stagnate and risk of SPB infestation was increasing. The thinning and release should provide several benefits: reduced pine stocking, improved survival and growth of the remaining pine trees, reduced future susceptibility of these stands to SPB attack, and improved future RCW habitat.

Precommercial thinning and release treatments were conducted over 393 acres during FY 2003 on the Angelina and Davy Crockett National Forests.

Evaluation: Guidelines provided in the *Plan* are being met in areas treated. Increasing reliance upon natural regeneration often requires follow-up treatments of precommercial thinning in order to meet the desired stocking levels.

Species or Issue: *Prescribed Fire.*

Findings: The following table provides a breakdown of information concerning all types of prescribed burning done during 1997-2003.

Table 1. Prescribed Fire – Acres

FY	Fuel Reduction	Brownspot Control (Longleaf)	Site Preparation 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
Totals	257,873	1,144	3,274	11,180	1,383	38,762	84,239	397,855

***Threatened and Endangered Species**

The *Plan* set an annual objective of approximately 100,000 acres of prescribed burning per year. A total of 76,045 acres were burned in FY 02. Burning weather was favorable for most of the burn season, but a shortage of staffing and helicopter availability tends to hold accomplishments below 100,000 acres. The National Forests and Grasslands in Texas (NFGT) is exploring ways to supplement both staffing and helicopter use to allow for more burning in the future.



Figure 1 Employee using drip torch during prescribed burning operation.

In FY 2002, the Caddo/LBJ NGS demonstrated one of the uses of prescribed fire by completing prescribed burning to move areas toward their DFC of native prairie. The objectives were to control encroaching vegetation, reduce downed woody and grass fuel loads, and stimulate growth of native, fire-dependant prairie species. The photo below shows a prescribed burn in progress.



Figure 2 Aerial view of prescribed burning on Grasslands unit.

In FY 03, a combination of wet weather and work conflicts caused the totals to fall below desirable levels. Most of the burning season in FY03 was taken up by NFGT cooperation in the space shuttle Columbia Recovery Effort.

Evaluation: Lack of prescribed burn treatments creates fuel buildups and results in safety concerns due to the threat of catastrophic wildfire. It also prevents the forest from managing fire-dependent habitats for plant and animal species.

Species or Issue: *Species Restoration.*

Findings: The following table shows the status of five communities identified in the *Plan* being used to track accomplishments to meet the objective of protecting and improving habitat for threatened, endangered, and sensitive (TES) plant and animal species.

Table 2. Species Restoration

Community	Forest Plan Status (Ac.)	Short-term Objective (Ac.)	2002 Status (Ac.)	Current Status (Ac.)
Longleaf Pine/Little Bluestem	21,000	40,000	26,921	26,699
Shortleaf/Oak/Hickory	150,000	160,000	152,900	153,328
Beech/White Oak	2,532	3,000	*2,532	*2,532
Little Bluestem/ Indian Grass	15,000	20,000	**15,000	**15,000
Bottomland Hardwood	25,000	50,000	31,493	31,386

*The Beech/White Oak Community.

**The Little Bluestem/Indian Grass Community.

Evaluation: As stated in earlier reports, the forests have not been able to achieve the *Plan's* desired level of restoration to longleaf and shortleaf pine sites by conversion from

slash pine (a species not native to Texas). Federal court injunctions have hampered the forests' ability to improve and/or establish habitat for threatened, endangered, and

sensitive (TES) plant and animal species. Since these injunctions were lifted in July 2003, the forests began implementing the management practices necessary to move towards the *Plan's* desired future condition.

Species or Issue: *Restoration of Storm Damaged Areas.*

Findings: The Angelina and Sabine NFs continued implementation of actions planned in the November 2000 Texas Blowdown Reforestation Environmental Impact Statement (EIS) Project. In FY 2002, prescribed burning for site preparation for reforestation was conducted on 625 acres in storm-damaged areas and 1,417 acres were accomplished in FY 2003.

Evaluation: Management activities should continue to prepare storm-affected areas for natural or artificial regeneration to ensure the development of vegetation to meet the desired future conditions prescribed by the *Plan* for the affected MA-1 and MA-2 sites.

Species or Issue: *Red-cockaded woodpecker (RCW) Midstory Control.*

Findings: Maintenance and improvement of RCW clusters, replacement and recruitment stands is accomplished through midstory control treatments. Table 3 illustrates the number of acres treated during the last several years.

Table 3. Acres of Midstory Treatments

Year	Acres Treated
1997	814
1998	976
1999	948
2000	900
2001	1,213
2002	1,092
2003	866

Evaluation: Treatments during 2002 and 2003 were consistent with prior years although more acres of midstory treatments are needed in order to facilitate recovery of the RCW.

Species or Issue: *Old-Growth Inventory.*

Findings: Silvicultural examinations are the mechanism for identifying old-growth stands

and stands to be managed under *Plan* standard Forest Wide (FW) 021. Although court injunctions caused the forest management programs on the NFGT to be sharply curtailed, some silvicultural field examinations were completed during this time period.

Table 4 shows a comparison of stands 95 years old and older in 1991 and 2002-2003 by forest and community type.

Table 4. Comparison of Stands 95 Years and Older by Forest Type

FOREST TYPE	1991 Acres	2002 Acres	2003 Acres
Dry and Dry Mesic Oak-Pine			
Loblolly pine	6,720	20,090	21,942
Shortleaf pine	12,100	24,825	28,667
Shortleaf pine-oak	32	302	389
Loblolly pine-hardwood	786	3,294	3,387
Northern red oak-hickory-yellow pine	0	31	31
Southern red oak-yellow pine	0	69	132
White oak-black oak-yellow pine	103	449	593
Post oak-black oak	62	94	94
Upland Longleaf			
Longleaf pine	165	183	183
Coastal Plain Upland Mesic Hardwood			
White oak-northern red oak-hickory	393	2,837	3,121
Beech-magnolia	123	395	395
River Floodplain Hardwood			
Baldcypress-water tupelo	0	11	11
Bottomland hardwood-yellow pine	679	1,819	1,963
Sugarberry-American elm-green ash	0	0	39
Swamp chestnut oak-cherrybark oak	1,502	2,914	2,979
Sweetgum-nuttall oak-willow	4,421	6,047	6,153
Laurel oak-willow oak	202	1,017	1,017
Bay			
Sweetbay-swamp tupelo-red maple	37	155	155
Undrained flatwoods	0	31	31
TOTAL	27,325	63,982	70,701

Note: 1991 acres are from *Plan* Appendix I, Table 2. FY 2002 and 2003 acres do not include all changes caused by the February 10, 1998 windstorm or extensive SPB mortality in the Indian Mounds and Turkey Hill wildernesses. CISC has been updated with some changes and we are continuing efforts in assessing and updating our inventories in these affected areas.

Evaluation: A CISC report summarizing stands over 94 years old was prepared using 2002 and 2003 stand data. A comparison of this report with 1991 data shows that the forest is fast becoming an “older” forest. There were four more forest types with stands 95 years old or older in 2002 and 5 more types in 2003 than there were in 1991. The acreage in stands over 94 years old has increased more than two-and-one-half times from 1991 to 2003. This “aging” of the forest is consistent with the DFC identified in the Plan that “areas of the forests will generally develop older-forest conditions.”

Species or Issue: *Bog Restoration.*

Findings: As reported earlier, numerous bogs have been located on both the Angelina and Sabine NFs. Ongoing monitoring of these bog communities occurs to determine if any damage is happening from unauthorized recreational use. No additional restoration worked was performed during the FY 02-03 period.

For additional information, see the narrative under Sphagnum-Breakrush Series (an herb-dominated community type including types of seepage bogs) in Appendix F.

Evaluation: In most cases, the Forest Supervisor’s Orders that were issued several years ago have been beneficial in protecting these special sites. Periodic monitoring is needed to assure damage is not occurring from any unauthorized use.

Management Indicator Species

Species or Issue: *Management Indicator Species (MIS).*

Findings: See Appendix F.

Evaluation: See Appendix F for recommendations for each MIS.

Threatened & Endangered Species

Species or Issue: *Threatened & Endangered Species (T&E).*

Findings: Eleven federally listed or endangered species may occur on the NFGT. They are the Red-cockaded woodpecker (RCW), American burying beetle, American Alligator, Bald Eagle, Black-capped vireo, Houston toad, Louisiana black bear, Navasota Ladies Tresses, American chaffseed, Texas trailing phlox and White bladderpod. The following chart provides information about each of the species except two. The RCW and Navasota Ladies Tresses were designated Management Indicator Species in the *Plan* and are addressed in detail in Appendix F of this report.

Table 5. Threatened and Endangered Species (except MIS)

Species	Current Information
American Alligator	Prefers sluggish or slow-moving bodies of water and seldom strays far from the water’s edge. Limitations to this species’ recovery are not habitat related. It is no longer biologically endangered or threatened, but is federally listed due to similarity in appearance to other threatened crocodylian species. Local populations are monitored by Texas Parks and Wildlife Department (TPWD) on an annual basis and are considered stable, allowing annual harvest in certain counties (USDA 1996).
American Burying Beetle	Species has been surveyed and located near the Caddo Area. More specific information will be published as it becomes available.
American Chaffseed	Occurs in sandy (sandy peat, sandy loam), acidic, seasonally moist to dry soils. It is generally found in habitats described as open, moist pine flatwoods, fire-maintained savannas, ecotonal areas between peaty wetlands and xeric sandy soils, and other open grass-sedge systems. Chaffseed is dependent on factors such as fire, mowing, or fluctuating water tables to maintain the crucial other open conditions it requires.
Bald Eagle	This federally listed threatened species is generally found in coastal areas and around large bodies of water such as reservoirs, lakes, and rivers. It was once in peril due to habitat modification and pesticide poisoning. However, with increased protection efforts and a ban on the use of DDT/DDE, the eagle population has increased to the extent that it was downlisted in 1995 from endangered to threatened by the USFWS. As mentioned in earlier reports, the USFWS published a proposed rule to de-list the Bald Eagle from its current threatened status. Occupied territories on the National Forests in Texas were 31, territories observed was 41, and total number of nests was 54 for 2003. A Chronological Outcome of Bald Eagle Nest Surveys on Forest Service Lands in Texas is available in the Forest Supervisor’s Office in Lufkin, Texas.

Species	Current Information
Black-capped vireo	The first survey on the Grasslands unit was completed in 1999 with a second in 2003. The survey protocol was obtained from the USFWS. No black-capped vireos were found with either survey. Assistance from both surveys was received from the local Audubon Society, Tallgrass Prairie. In 2003, Gilbert Echrich (a black-capped vireo expert), was invited to provide input to the areas that were being surveyed. Echrich advised which areas surveyed had the highest potential for black-capped vireos. The lack of fire had allowed the woody vegetation, in these areas to become to mature. Echrich believes fires would improve the habitat for the black-capped vireo.
Houston Toad	The Houston Toad seems to occur in southeastern and east-central Texas on rolling uplands characterized by mainly pine or oak woodlands and native grasses (where openings occur). The species apparently requires the presence of a wide, deep horizon of sand and loamy sandy soils in which it can easily burrow for hibernation or aestivation purposes. Some potential habitat does exist on the Sam Houston National Forest (San Jacinto County), but no surveys have located the species yet.
Louisiana Black Bear	The Louisiana Black Bear is a habitat generalist and often overwinters in hollow cypress trees either in or along sloughs, lakes, or riverbanks in bottomland habitats of the Tensas and Atchafalya river basins. These bears are mobile, opportunistic, largely herbivorous omnivores that exploit a variety of foods closely track phenological development. The size of an individual's range or area it transverse annually to secure food and mates and to care for young, is probably directly related to the diversity of vegetative cover, or habitats.
Piping Plover	Designated areas of critical habitat included prairie alkali wetlands and surrounding shoreline; river channels and associated sandbars and islands; and reservoirs and inland lakes and their sparsely vegetated shorelines, peninsulas, and islands.
Texas Trailing Phlox	Once occurring at 17 sites in Hardin, Polk and Tyler Counties only two populations are currently known to exist. Texas trailing phlox is restricted to sandy soils of open pine woodlands. Suitable sites are limited, and many have been lost to disturbance. The species habitat has been affected by housing development, pipeline and highway construction, fire suppression, and conversion to pine plantations. Reproduction of the plant appears to be sporadic and slow.
White Bladderpod	Six populations occupying less than 30 acres are known from private land and a county road right-of-way in San Augustine County. Critical habitat has not been designated.

Evaluation: Where suitable habitat occurs within any proposed project area, proposals should be analyzed to determine if there will be any direct, indirect or cumulative effects on the species before actions are implemented.

The NFGT should continue monitoring efforts in cooperation with other agencies.

Other Species of Concern

Species or Issue: *Rafinesque's big-eared bats*

Findings: This species occurs throughout the southeastern U.S., with the western limit of its range extending into eastern Texas. This is classified a threatened species in Texas. Its natural roosting habitat consists of hollow trees, behind loose bark, and under dry leaves. It is also been known to roost in unoccupied

buildings, wells, and cisterns (Schmidly 1991, Davis and Schmidly 1994). This bat has been recorded in 16 counties in eastern Texas (Mirowsky and Horner 1997). It is thought to be in decline in more than half of the states within its range, including Texas.

Several surveys were completed in 2002/2003 on the Angelina NF. These surveys were lead by Meg Goodman, Texas Bat Biologist for Texas Parks and Wildlife (TPWD) and Bat Conservation International. Over 25 bats were found at Aldridge Saw Mill, which has been a maternity roost site since 1995 with the greatest number of bats roosting in the Spring/Summer months. One other site was located in a double box culvert off 255 in the Angelina NF that had a few Rafinesque's big-eared bats throughout the year.

Evaluation: The NFGT will continue its survey efforts, in cooperation with TPWD personnel. The Angelina NF is studying options for providing additional nesting habitat for this species.

Species or Issue: *Monitoring Avian Productivity and Survivorship (MAPS).*

Findings: As stated in the 2000-2001 report, this program was developed to provide conservation and management information for populations of landbirds within the U.S. and Canada. The overall plan for achieving a specific set of monitoring, research, and management objectives during 2001-2003 was the intent to produce a ten-year summary of regional patterns and trends in productivity indices and estimates of adult population size, adult survival rate, recruitment rate into the adult population, and population growth rate for about 100 target species. This would include a comparison of data to population trend data from the BBS and other sources. This will represent the first ever comprehensive summary and regional analysis of the vital rates of 100 or so of the more common landbird species over an entire continent. At the time this M&E Report was

prepared, data for this physiographic region was not available. Additional information can be found at <http://birdpop.org/>.

Evaluation: Completion of the objectives outlined in MAPS will allow the information to be applied to the development and implementation of landscape-level management plans in a scientifically rigorous manner. This program will help land managers identify those species whose population declines can be reversed by increasing their productivity, and then to formulate appropriate management strategies for them.

Species or Issue: *Project Prairie Birds.*

Findings: As a whole, prairie birds are on a decline because of habitat loss. Transects have been established on the Sam Houston and Sabine NFs and LBJ NGs.

Transects are normally monitored annually. The purpose for monitoring is to determine the wintering distribution of grasslands species, to identify habitat preferences for these species, and utilize the data collected to develop land management recommendations.

Evaluation: Five years worth of data needs to be collected and analyzed before any determination can be made about vegetation or populations trends. Monitoring of established transects needs to continue to determine whether NFGT management actions are contributing to habitat loss for these species.

Species or Issue: *Breeding Bird Survey.*

Findings: In 2003, the Sabine NF participated in the breeding bird survey. This survey was completed with the assistance of the TPWD. Cliff Shackelford, the TPWD non-game ornithologist, participated in a national monitoring program by completing the "Breeding Bird Routes". The results for this survey will be published when data can be analyzed by TPWD. Although it was our

intent to provide regional maps in this report, they were unavailable. More information can be found at <http://www.im.nbs.gov>.

Evaluation: Texas Parks and Wildlife Department (TPWD) is the lead agency for this program, and maps have not been developed due to the lack of funding and other priorities taking precedence over this project. Indications are that this will not be accomplished in the near future. It will be several years before enough data is collected to do an adequate analysis.

Species or Issue: *Globally Important Bird Areas.*

Findings: The Angelina and Sam Houston have this designation, but no monitoring requirements or reporting go with it. There is nothing new to report at this time.

Aquatics Species Inventories

Species or Issue: *Aquatic Species Inventories.*

Findings: See Appendix F for information about this issue.

Sub-Issue 2. Forest & Range Health

The list of NFMA elements for this sub-issue is:

- Identify measures needed to coordinate emissions from NFS lands with other sources to ensure air quality control and compliance with the applicable Federal, State, and/or local standards or regulations (36 CFR 219.27(a)(12)).
- Ensure that air quality standards are maintained on Forest Service Class I and II lands (36 CFR 219.27(a)(12)).
- Determine if insects, disease, and noxious weeds have increased to

damaging levels (36 CFR 219.12(k)(5)(iv) and 219.20(b)).

Air Quality

Species or Issue: *Air Quality.*

Findings: During FY 2002, the NFGT continued coordination efforts with its Air Quality Zone Specialist to assure air quality standards were being met during planning and implementation of projects. However, the Zone Air Specialist was not available for consultation during FY 2003 due to a transfer of station. The NFGT continued to implement air quality through coordination with the Regional Air Quality Program Manager and through direct contact with the Texas Commission on Environmental Quality (TCEQ).

Evaluation: The forest is continuing to move forward in improving adherence to Federal and State Air Quality Standards and Regulations, as set forth in the *Plan*.

Integrated Pest Management

Species or Issue: *Gypsy Moth & other Exotic Pests.*

Findings: No gypsy moths have been captured on the NFGT to date. No exotic invasive pests have been reported as causing problems either.

Evaluation: Continue annual trapping for gypsy moths. Cooperate with the Texas Forest Service, APHIS, and other agencies to disseminate information on exotic and/or invasive pests such as sudden oak death or the emerald ash borer to the districts. Districts should immediately report any suspect infestations of invasive pests.

Species or Issue: *Ips Beetles.*

Findings: No suppression actions were taken in 2002-2003.

Evaluation: *Ips* populations remain at fairly low levels. Districts should report any expanding infestations involving 10 plus trees. These infestations should also be recorded in the Southern Pine Beetle Information System (SPBIS), because it now includes options for other bark beetles.

Species or Issue: *Southern Pine Beetle.*

Findings: The annual SPB spring survey predicted low SPB populations in east Texas for 2002-2003; no SPB infestations were reported. (Note: The Forest Health Protection 2003 SPB South-wide Monitoring Survey is on file in the forest Supervisor's Office in Lufkin, Texas).



SPB galleries and larvae inside an attacked tree. The adult beetles producing winding, S-shaped galleries in the inner bark of the tree, laying eggs as they tunnel. The eggs hatch and the larvae consume the phloem tissue of the inner bark.

Figure 3. From <http://www.srs.fs.usda.gov/>

Evaluation: The annual spring surveys should continue. The new SPBIS is under revision and will be installed when the revision is complete. A new electronic digital sketch-mapping system for aerial detection of infestations has been purchased and will be used when detection flights are initiated. The NFGT still has a preponderance of high hazard pine stands, and efforts should continue to reduce the hazard through thinning or other silvicultural methods. Districts should utilize hazard-rating systems to identify high hazard stands and plan management activities. The NFGT is working with Forest Health Protection (FHP) to obtain SPB prevention funds to help finance hazard reduction. Forest Healthy Protection, in cooperation with Forest Service Research and the NFGT, has several ongoing projects designed to reduce impacts from SPB outbreaks and help restore affected areas. The NFGT should incorporate tools such as stewardship or service contracts into its Integrated Pest Management program to expedite suppression and prevention activities.

Species or Issue: *Invasive plant species - Sericea lespedeza.*

Findings: Although originally reported as an issue for the Grasslands unit, no problems were reported by any unit during this reporting period.

Evaluation: The Grasslands unit will continue to monitor areas to determine if further treatment is needed.

Species or Issue: *Invasive plant species - Kudzu.*

Findings: The Angelina NF has the only known spot and it was monitored during the FY 2002-2003 period.

Evaluation: This species is not considered to be a threat to the NFGT at this time.

Species or Issue: *Invasive plant species - Floating Water-Hyacinth.*

Findings: Although efforts to control this species continues for Lake Conroe and Lake Livingston (near the Sam Houston NF), no major problems were reported by other NFGT units.

Evaluation: To date, this is not an issue or threat for the NFGT.

Species or Issue: *Invasive plant species - Hydrilla.*

Findings: This species can be found in Lake Sam Rayburn and actually on the Angelina NF in one large, shallow oxbow pond in the McGee Bend Tract (south of the dam.) It is still not a problem because the area is isolated. There are no reports from other units stating this is a problem.

Evaluation: This specie does not appear to be a threat to the NFGT at this time. The Angelina NF will continue monitoring of its one site.

Species or Issue: *Invasive plant species – Aquatic Weeds in Ratcliff Lake.*

Findings: The Davy Crockett NF continued its efforts to control aquatic weeds in Ratcliff Lake and to date has been very successful.

Evaluation: Monitoring and necessary control efforts should continue where these invasive species are found.

Species or Issue: *Japanese Climbing Fern.*

Findings: The Angelina NF discovered this species on its unit, but believes it is controlled with prescribed burning.

Evaluation: Monitoring should continue and locations where this species appears to be spreading should be reported. Some control efforts may be needed.

Species or Issue: *Chinese Tallowtrees.*

Findings: The Angelina NF has a problem around the Sam Rayburn lakeshore. This tree is spread by birds and seeds in water from upstream. When high water occurs, this takes the seed source to inland sites. The problem occurs at Caney Creek (as an example). It can be dealt with by pulling young sprigs by hand or by multiple herbicide applications. Currently, no actions are planned to deal with this issue (although it seems to be a growing problem.)

Evaluation: Units should continue monitoring to determine if areas are affected by this species. Management actions may be needed to prevent continuing growth and spread.

Species or Issue: *Feral Hogs.*

Findings: The numbers are growing yearly on the Angelina NF. They compete with other wildlife species for acorns, disrupt native vegetation with their feeding activities, and disrupt/destroy nests of ground birds like quail and turkey. They affect future oak regeneration. Hunting is available year round, but it is underutilized. Presently, this is not a problem in pine plantations, but as soon as the unit begins planting and regeneration again, there will be a problem with hogs eating the seedlings.

The SFA Experimental Forest also experiences problems from feral hogs and has one hunter/trapper who is contracted to control their numbers. This individual checks all areas periodically. If Research Station personnel notice a problem, they also contact the hunter so he can reduce the population affecting the unit.

Hogs are also a problem on the Caddo Unit in the bottoms. This unit experiences the same concerns as the Angelina NF. Hogs are also increasing on the LBJ unit, but not yet to the level as those on the Caddo unit.

Trapping and hunting on the Sam Houston NF is popular and has helped to somewhat reduce/control the feral hog activity.

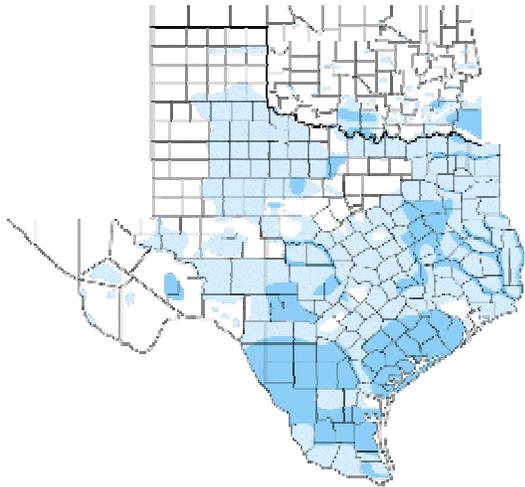


Figure 4 Feral hog distribution in Oklahoma and Texas. Darker areas indicate denser populations.

The distribution map and more information about this growing problem can be found at: <http://www.noble.org/Ag/Wildlife/FeralHogs/OK-TXmap.htm>

Evaluation: Trapping and hunting efforts should be continued to reduce the feral hog population on NFGT units.

Other Mortality Events

Species or Issue: *Drought (Rainfall Deficit).*

Findings: The drought situation was eased on the Grasslands by above normal rainfall for 2002. Yearly rainfall of 41.53 inches was the second consecutive normal rainfall (39.25 inches avg./yr) received since 1997. Even with near normal rains, there is a 24.1 inch deficit over the 4 year period beginning in 1998. Grazing conditions are in good shape on the Caddo and LBJ NGs, but pond and lake levels were low entering into 2002. This situation was monitored closely by Grasslands staff to determine if grazing levels needed to be reduced.

A slight to moderate drought situation also occurred on the Grasslands in 2003. Yearly rainfall as of September 1 showed an 8.25 inch deficit from normal annual rainfall (39.25 inches avg./yr). Once again, grazing conditions were adequate, but pond and lake levels began to drop going into FY 2004. Grasslands staff will determine if grazing levels will need to be reduced during 2004.

In addition, see the information under **Sub-Issue 3. Watershed Conditions, Watershed Improvement Work.**

Evaluation: Ongoing monitoring of effects from rainfall deficits should continue so proposed management actions can be modified as necessary to protect resources.

Species or Issue: *Losses Due to Wildfires.*

Findings: No resource losses were reported from wildfires in 2002 or 2003.

Sub-Issue 3. Watershed Conditions

National Forest Management Act (NFMA) requirements for this sub-issue include direction to:

- Determine if the conservation of soil and water resources are being ensured and the permanent impairment of site productivity is being avoided (36 CFR 219.27(b)(5)).
- Determine if the desired water quality and quantity objectives are being achieved (36 CFR 219.27(b)(6)).
- Ensure compliance with State Water Quality requirements, monitor the effect and adequacy of the BMPs (36 CFR 219.27(a)(4), (b)(5), & (c)(6) and 219.12(k)(2)).
- Determine the effects of management actions on soil quality and site productivity (36 CFR 219.27(a)(1), (b)(5)).

- Determine the effects of management actions on riparian values, soil and water quality, and streambank stability (36 CFR 219.27 (a)(4), (b)(6), (c)(6) & (e)).
- Determine if temporary roads are being revegetated within 10 years of contract or permit termination (36 CFR 219.27(a)(11)).

Species or Issue:

***Macroinvertebrate/Water Quality
Baseline Inventory.***

Findings: Collection of baseline water quality data continues. In May 2002, three theses were submitted to the Graduate School of SFA in partial fulfillment of the requirements for the degree of Master of Science. These reports are detailed below.

- The Effect of Prescribed Burning on Benthic Macroinvertebrate Communities of Two East Texas Creeks.

This thesis was submitted by Jason Begnaud. In his abstract, he stated, “Prescribed burns in the Sabine NF were scheduled in order to reduce fuel loads on the forest floor and to improve RCW habitat. The burns took place in February 2002 (Brawley Creek) and March 2002 (Grannies Creek). Each stream was monitored upstream and downstream of the burn.” After a description of the sampling methods and results are provided, Begnaud states, “In the seasonal data on Brawley and Grannies Creeks, no effects could be contributed to the prescribed burn.” In addition, “...no statistical difference existed between the up and downstream sites. A SMZ (streamside management zone) on each creek maybe aided in the evaluation of no significant effects from the burn.”

- The Effects of Timber Salvage Operations on Water Quality of Cypress Creek in the Sabine National Forest, Texas.

Eric S. Bozeman submitted this thesis. Bozeman discusses the 1998 windstorm and describes that the Sabine NF used mechanical site preparation methods for areas where reforestation was to begin and that the site preparation activities took place prior to the sampling period. Cypress Creek was analyzed for the project where physicochemical, benthic macroinvertebrate, and ichthyological parameters were analyzed for significant differences between upstream and downstream sites and differences between seasons. In his findings, Bozeman states, “There were significantly higher seasonal concentrations during the winter for total solids, total suspended solids, and turbidity. These increases were short-term and became reduced after a short period of time but were unrelated to the site preparation activities. Some stress was indicatedfor the benthic macroinvertebrates and stress was seen.....in the fish survey. This stress is most likely due to lack of habitat which is characteristics of first order streams. Overall, it is shown that site preparation had little to no impact on stream water quality.”

- The Effects of a Controlled Burn on the Water Quality of Two East Texas Streams in the Sabine NF.

James M. Rachal authored this thesis. In his thesis, Rachal discusses prescribed fire as a management tool. His paper describes the physicochemical effects of a prescribed fire on two first order streams. The streams were monitored upstream of the fire and downstream

to ascertain whether any effects could be determined. Based on his findings, only two parameters showed a significant difference. His conclusions indicated that increases in iron and ammonium-nitrogen could possibly have been from increased overland flow into the stream attributed to the fact the area had received a good deal of rain at about the same time the burns were taking place. Quoting text from the abstract, "All other sites and physicochemical parameters showed no significant differences other than seasonal differences."

Evaluation: Data from these samplings will provide a baseline against which future samples, taken after significant management actions, may be compared.

Species or Issue: *Long-Term Soil Productivity Study.*

Findings: District personnel continued to collect and mail data to the Research Station in Pineville, Louisiana for this study that is part of a national effort to detect changes in productivity related to timber management. Plans are to widen the protection line around the outer boundary of the study area and to widen the plot lines. The weathers stations and all protection lines will continue to be maintained. Erosion had developed on several of the protection and plot lines and was mitigated by district personnel by use of mechanical and hand-held equipment and application of seed and fertilizer.

Evaluation: Data has been collected on the plots for eight years. Preliminary findings will be analyzed and reported in the next annual M&E report.

Species or Issue: *Multi-Use Trail Management.*

Findings: In late March 2002, Wise County (LBJ Unit) received over six inches of rain in a 48 hour period. Two recently completed trail

crossings in the TADRA Multi-use Trail System received erosion damage from the excessive run-off. On April 18, 2002 (with the assistance of a track loader) the erosion was fixed and erosion control blankets were installed. Once completed, the erosion work covered approximately two acres.



Figure 5. East side of trail crossing.



Figure 6. West side of trail crossing.

Also see the topic **Off-Road Vehicle (ORV) Closures** later in this section of the report and the topic **Trail Work** under **Issue B. Sustainable Multiple Forest and Range Benefits, Sub-Issue 1. Outdoor Recreation Opportunities.**

Evaluation: See the evaluations under **Off-Road Vehicle (ORV) Closures and Trail Work.**

Species or Issue: *Oil Well Spills & Salt-Water Discharge.*

Findings: As detailed in the last report, the Angelina NF continued work with several cooperating agencies in plugging and restoring an abandoned oil well that had been discharging a mixture of water and crude oil onto the ground near the Upland Island Wilderness. All restoration activities were completed in early FY 2002. In March 2002, SFA and Forest Service personnel performed post-project monitoring to document the surface reclamation effectiveness of the plugging project. The preliminary results of the post-plugging monitoring indicated water chemistry met acceptable limits. Reports detailing these monitoring efforts are on file in the Forest Supervisor's Office in Lufkin, Texas.

On the Sam Houston, two spills were reported for FY 2003. One was a saltwater mixed with oil, while the other was an oil spill. Both were less than 50 gallons and appeared to occur due to overflow of tanks. The saltwater spill was cleaned up; however, the operator and the Forest Service are working together to develop additional measures for a more satisfactory cleanup and to prevent such occurrences in the future. The Forest Service has initiated cleanup measures for the oil spill, but the operator has yet to take action.

The LBJ reported no spills for FY 2002. In FY 2003, the LBJ reported one spill of less than five barrels of oil from a damaged pipeline. The spill was contained in the right-of-way. The permittee removed all contaminated soils and administered further clean-up through bio-remediation. The damaged pipeline was replaced.

No spills or discharges occurred on the Sabine or Davy Crockett NF during FY 2002 or 2003.

Evaluation: Plugging and restoration of the abandoned well on the Angelina NF by the Environmental Protection Agency were satisfactory and to Forest Service standards.

Containment of the two spills on the Sam Houston NF was achieved and clean-up efforts are continuing. The spill was contained on-site by the dike. The Sam Houston NF will re-test the spill area within a year following the spill occurrence. Monitoring of the situation will continue until clean-up efforts are satisfactory and to Forest Service standards.

The LBJ NGs will continue to monitor the spill area for a year after the spill. The district will then report on the condition of the bio-remediation.

Species or Issue: *Off-Road Vehicle (ORV) Closures.*

Findings: Results of two studies conducted by graduate students in environmental studies at Stephen F. Austin State University were submitted to the U.S. Forest Service in December 2001 (FY 2002). Each study showed no significant differences in water quality at each of six off-road vehicle stream crossings for 52 variables studied on the Angelina NF. Each study noted visual observations of habitat deterioration and erosion; however, benthic and physicochemical parameters did not show significant impacts from off-road trail water crossings. Each study compared upstream water quality indices to downstream water quality indices. One site showed differences in turbidity that may be attributed to erosion from an old railroad tram. Recommendations included minimizing stream crossings, hardening trails, and designing trails parallel to the contour of the site to reduce erosion.

In FY 2002, a Memorandum of Understanding (MOU) was signed by the Texas Motorized Trails Coalition (TMTTC) to assist the forest with activities to enhance motorized trail opportunities while protecting resources.

In FY 2003, proposals were submitted to the USFS Regional Office to obtain funds in FY 2004 for extensive monitoring on the Angelina and Kisatchie off-road trails and for an evaluation of the Sam Houston Multiple-Use (motorized) Trail.

Also see the information about violations that are occurring in areas of the forest under **Sub-Issue 3. Human Influences, Visitor and Resource Protection.**

Evaluation: Off-road vehicle use is a legitimate recreation activity when it can be offered while protecting and maintaining other resources. In order to improve management, the NFGT are working toward designated trails for off-road use. Off-road vehicle use is already restricted to designated trails only on the Sam Houston. The Grasslands is closed to off-road use due to the sensitive grasslands ecosystem. Once the Angelina NF multiple-use motorized trail is established, the remainder of the forest will be closed to vehicles off of Forest Service roads.

Species or Issue: *Soil Resource Inventory Acres & Soil and Water Improvement Accomplishments.*

Findings: The Natural Resource Conservation Service (NRCS) contract implemented in FY 2002 to digitize the Soil Resource Inventory (SRI) for the entire NFGT at 1:24,000 was completed (except of the Caddo/LBJ NGs). Plans are to have the Caddo/LBJ section completed and delivered by the end of calendar year 2003.

Evaluation: The forest is meeting the requirements of the National Cooperative Soil Resource Inventory.

Species or Issue: *Streamside Management Zones (SMZs).*

Findings: In FY 2002, several field trips were made to the districts to conduct field training on identifying SMZs. Employees on the Sam Houston and the Davy Crockett Ranger Districts participated in this field training.

In FY 2003, implementation monitoring revealed violations of the *Plan* for Management Area 4 on the Angelina, Sabine NFs and the LBJ NGs. Violations on the Angelina NF consisted of a plowed fire-line within 50 feet of perennial and intermittent stream channels; and placing soil and woody debris into an intermittent stream for use as a temporary crossing. The fire-lines were immediately restored by use of hand tools and the application of seed and fertilizer. The soil and woody debris placed in the intermittent stream was removed prior to any major storm events; therefore, reducing the potential for introduction of sediment into the stream system.

Violations on the Sabine District consisted of a plowed fire-line within 50 feet of an intermittent stream channel, and mechanical site preparation was performed within 50 feet of an intermittent stream channel. All violations were mitigated by use of hand tools and the application of seed and fertilizer.

In addition, one unit on the Grasslands experienced problems with damage to stream banks from trespass cattle in a unit not permitted for grazing. This caused increased erosion/sedimentation. An environmental assessment is being prepared and following issues being considered during the process:

1. Whether grazing should be allowed;
2. How can the unit prevent this type of damage from occurring; and/or
3. How can the unit mitigate these problems?

The trespass problem has been resolved and the assessment should help the unit determine if other actions are needed.

Another issue from the Caddo/LBJ unit resulted from construction of a permanent fireline adjacent to a perennial creek. In FY 2003, rehabilitation of the method used to diverted water was accomplished to prevent sediment from entering the stream and reseeding using native species occurred.

Although not a violation of the SMZs, the LBJ unit reported it constructed two recreational trails that crossed an intermittent stream with a deeply incised channel. The unit implemented Best Management Practices (BMPs) in the construction of erosion structures on the approaches to the streams as well as with the structure used in the stream channel. These structures are functioning well only allowing a minimal amount of sediment into the stream channel.

Evaluation: Although the current Standards and Guidelines were violated for Management Area 4 (MA-4), there was no evidence that the encroachments caused any adverse affects to soil and water values.

Species or Issue: *Ten Percent Roads & Trails Funds (TRTR) Accomplishments.*

Findings: In FY 2002 and FY 2003, the NFGT did not use any TRTR funds. There are some carryover funds that are planned for use in FY 2004.

Species or Issue: *Texas Forest Service (TFS) Best Management Practices (BMPs) Results.*

Findings: TFS conducted a BMP compliance check on a Sabine NF timber sale in FY 2002. Operations were inspected to determine if BMPs were properly used to protect water quality for roads, skid trails, stream crossings, SMZs and landings. The tract received an overall compliance of 100 percent and an “excellent” rating, as shown in

a report by Texas Forest dated April 4, 2002. No BMP compliance checks on National Forest Timber Sales were completed by the Texas Forest Service in FY 2003.

Evaluation: National Forest in Texas sites checked in FY 2002 by TFS received an “excellent” rating. Logging operations on national forest lands have continually received the highest BMP ratings in the state for protecting water quality.

Species or Issue: *Timber Sale Erosion Control Efforts.*

Findings: Districts have continued with necessary post-sale erosion control monitoring efforts; however, issues such as waterbar construction and documentation of inspections by employees still need to be improved.

In order to meet NFMA and *Plan* requirements, in most cases all disturbed road areas involved in a contract or permit are revegetated within one year of termination of the contract or permit. The sales administrator or the engineering technician in the field verifies the actual placement of seed and fertilizer. Personnel working in these areas monitor these road areas on a continued basis.

Any erosion problems discovered by field personnel are reported to district offices.

Evaluation: The forest should continue to assess the effectiveness of additional post-sale erosion control requirements to prevent sediment from entering streams. The conclusion is that overall all sites reviewed are meeting the DFCs stated in the *Plan*.

Species or Issue: *Watershed Improvement Work.*

Findings: A total of 372 acres of watershed improvement work was completed on the NFGT during FY 2002.

The watershed program on the Grasslands was helped in 2002 by the normal rainfalls. Projects were completed with no disruptions due to low soil moisture content.

One of the areas addressed involved erosion control problems occurring on a landline with an adjacent landowner to the LBJ Unit. The source of the problem was on private land, with the majority of the erosion occurring on Forest Service land. In February 2002, approximately four acres of erosion control work was completed by building a dam and terrace on the Grasslands and private land. The work was done with the cooperation of the landowner through the Wyden Amendment. This project controls the sedimentation and further erosion of the area and also builds a partnership with the landowner.



Figure 7. Area before the project.



Figure 8. Area during the project.



Figure 9. Area after mulching and seeding.



Figure 10. Area after completion of project.

Conditions in 2003 were monitored closely before major watershed restoration projects began. The reseeding of watershed restoration projects on 56 acres was completed due to seed failure from FY 2001 efforts. Another 102 acres of seeding was successfully completed.

In 2003, a total of 350 acres of watershed improvement work was completed. All of this work was completed on Caddo/LBJ NGs. Projects totaling 65 acres were delayed in contracting due to fire borrowing for the 2003 Western Fire Season. This contract was awarded in October 2003 and will be completed in 2004.

Evaluation: The NFGT continues to maintain good watershed condition and to adhere to the 319 Section of the Clean Water Act. Efforts are continuing in updating the Watershed Improvement Needs Inventory so it can be converted to the new Watershed Improvement Tracking (WIT) database portion of the Natural Resource Information System (NRIS) system.

Species or Issue: *Well Plugging or Closures.*

Findings: Subsequent reviews of Sabine NF sites mentioned in 2000-2001 report indicate that the work done was successful. The well sites in Compartment 89 have revegetated. The Compartment 103 tank battery and pipeline have been cleaned up and revegetated. In addition, the site in Compartment 113 has been converted to a dispersed hunter's camp.

In FY 2002, restoration activity needed on several U.S. and private wells also on the Sabine NF continued to be impacted by the bankruptcy filing of the operator. Some of the federal sites had severe erosion problems. The courts signed an Agreed Order on Debtors Obligation to Proof of Claim in November 2001 detailing needed improvements and restoration activities. The sites have not been reduced in size, nor has the court required corrective actions take place on these sites. However, during FY 2002 and 2003 the Forest Service took corrective actions on erosion gullies and soil movement. Terraces and erosion devices were installed to carry water off location. Riprap was added in low areas to prevent gullies. All intermediate revegetation efforts were successful. These sites will be revisited and monitored until final restoration is reported.

One well each was plugged on the Sam Houston NF and LBJ NGs during FY 2003. During FY 2002 and 2003, no wells were plugged on the Sabine. However, five wells are currently in various stages of being plugged, while the LBJ has approximately three wells being plugged. These locations will need monitoring until final restoration is considered acceptable. No wells were plugged on the Angelina and Davy Crockett NF. The LBJ NG closed case files for 8 USA wells.

Evaluation: The NFGT is addressing the need to rehabilitate its plugged sites to meet Texas Railroad Commission specifications. Emphasis is placed on verification of final restoration and assuring re-vegetation is successful.