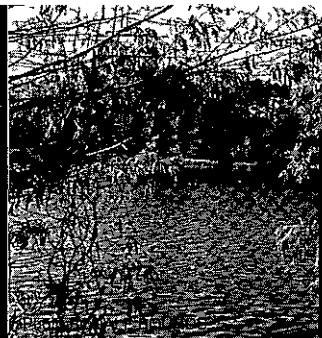


## SUMMARY

# Five Year Review/AMS



LYNDON B. JOHNSON N.G.

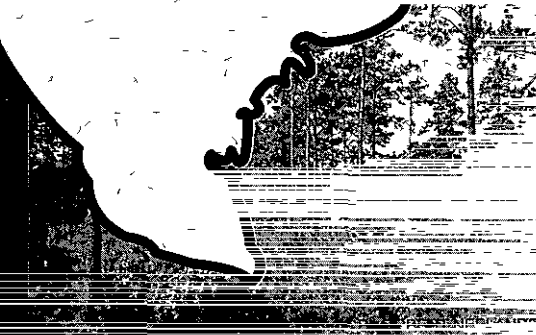
CADDÖ N.G.

SABINE N.F.

DAVY CROCKETT N.F.

ANGELINA N.F.

SAM HOUSTON N.F.



## National Forests and Grasslands in Texas



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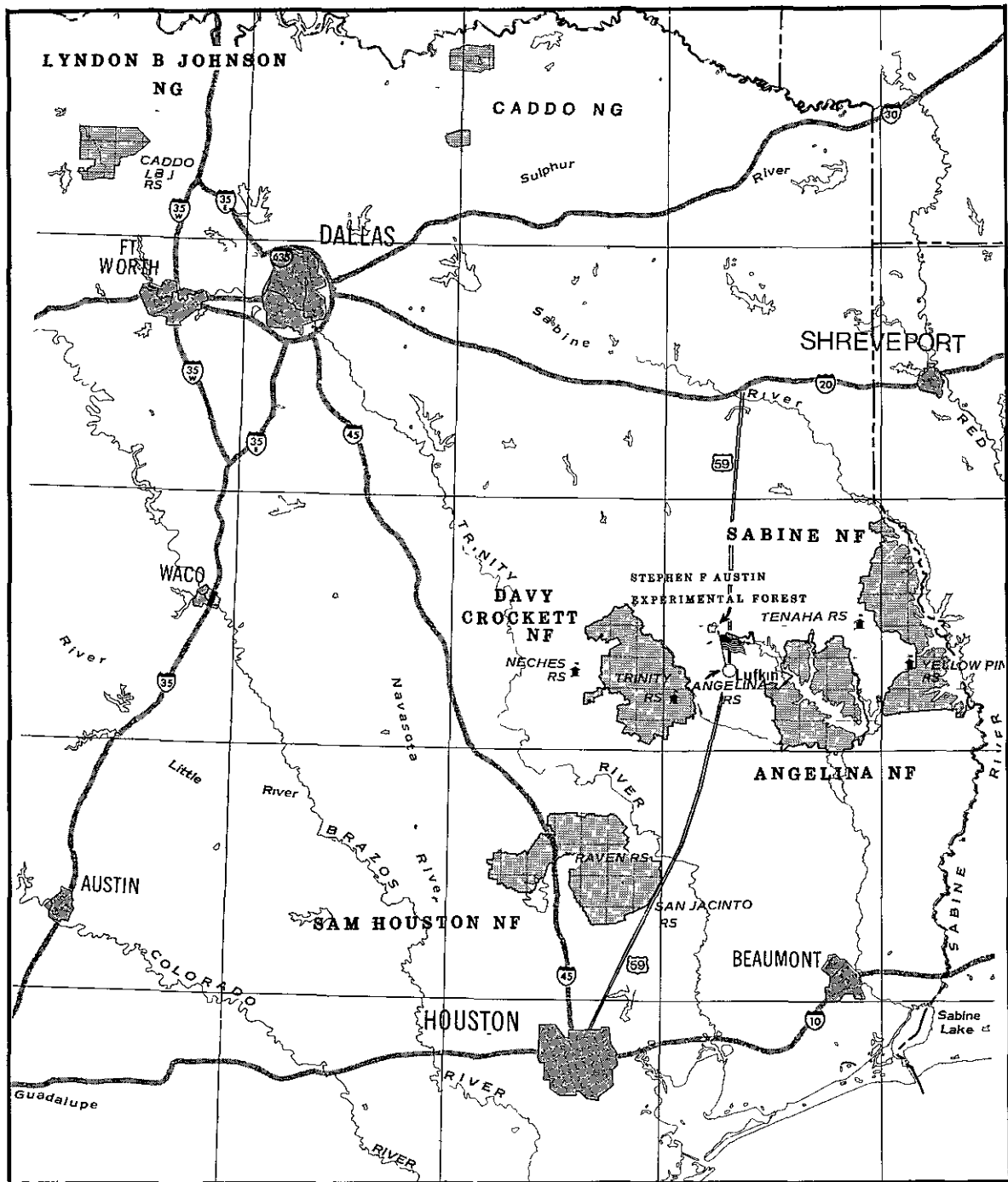
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# National Forests & Grasslands



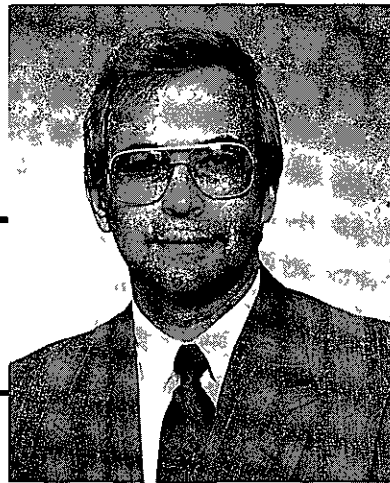
## Texas



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## HIGHLIGHTS

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Alan Newman  
Forest Supervisor

Dear Reader:

As you may recall, we promised we would try to bring you with us through the long and often complex planning process. We completed the first phase of the Forest Plan revision effort, preliminary scoping, and reported back to you through Newsletters #2 and #3. We have been working on a Analysis of the Management Situation (AMS) and also a Five-Year Monitoring and Evaluation Report.

We have now completed the Five-Year Review and AMS, and have combined these into one comprehensive document. The rationale for doing this is described in more detail in the Introduction of this Highlights. I am proud of the Five-Year Review/AMS. It represents a great deal of work by many individuals representing a wide variety of specialties. The final report was closely reviewed for accuracy and completeness, including several reviews by non-Forest Service subject matter experts.

This document, the Highlights of the Five-Year Review/Analysis of the Management Situation (AMS), summarizes information we have gathered regarding the economic, social, physical and biological environment and contains the main findings of monitoring five years of Forest Plan implementation.

More detailed information on these topics can be found in the 915-page Five-Year Review/AMS and the 634-page Socio-Economic Overview. Because of their bulk and the tremendous cost in duplicating and mailing documents of this size, we have not provided those documents to you. However, they are both available for review at our headquarters at 701 N. First Street in Lufkin, Texas, and at all Ranger District offices.

If you have any questions about the Highlights, the full-length document, or the land management planning process, please call Planning Team Leader Reese Pope or Land Management Planning Staff Officer Dennis Robertson at 409/639-8501.

I appreciate your interest in the planning process and in the National Forests and Grasslands in Texas.

A handwritten signature in black ink, appearing to read "Alan G. Newman". The signature is fluid and cursive, with a large initial "A" and "N".

ALAN G. NEWMAN  
Forest Supervisor



## OVERVIEW

On May 20, 1987, the Forest Plan for the National Forests and Grasslands in Texas was approved. During the administrative review period, the Forest Plan was appealed and contested in court. On June 17, 1988, the Federal District Court issued a permanent injunction enjoining the Forest Service from failing to implement certain practices within 1,200 meters of red-cockaded woodpecker colony sites. The Forest Service appealed this decision, and on March 4, 1991, the appeals court ruled that management ordered by the district court was to continue until a new plan could be prepared. The new plan was to be developed in consultation with appropriate agencies and reviewed by the district court using arbitrary and capricious standards of review.

In response to administrative appeals, the Chief of the Forest Service remanded the Forest Plan to consider the effects of changes in red-cockaded woodpecker management and other issues. Because the court-ordered woodpecker management strategy affected one-third of the Forest, the Chief determined that a revision would be necessary.

We have begun to revise the Forest Plan. The first phase for revision was the scoping or initial public involvement phase which was done in late 1990. Initial public involvement for the revision elicited over 4,400 comments. In comparison, only 177 comments were received for the 1987 Forest Plan. The Forest interdisciplinary team, comprised of resource specialists, carefully reviewed the comments and identified 15 issues, 53 sub-issues, and about 500 unique comments from these letters.



Planning Team Members

Photo: Gay Ippolito



During the Analysis of the Management Situation (AMS) phase, the ability of the Forest to produce needed goods and services is examined. The AMS describes the biological, social, economic, and physical environment on the Forest, and examines the ability to produce needed goods and services from these values and resources.

Another phase of planning is monitoring and evaluating the results of current plan implementation. This is a continuing process accomplished through reviews made by the Forest interdisciplinary team, Staff Officers, District Rangers, and resource specialists. Monitoring allows us to see if we are staying within the standards and guidelines of the plan, if we are producing the goods and services we estimated we could produce, and if our standards and guidelines are producing the desired future condition envisioned for the Forests and Grasslands. Previous monitoring and evaluation results are contained in two annual monitoring reports.

The planning regulations require the Forest Supervisor to review land conditions at least every five years to determine whether conditions or public demands for good and services have significantly changed. The Five-Year Review/AMS fulfills this requirement by identifying areas where changes may be needed in the revision of the Forest Plan. This process brings together physical, biological, economic and social considerations, public issues, management concerns, and monitoring results into a summary statement. These two efforts were combined in one document because they are interrelated. The intent of the document is to: 1) describe the existing environment, 2) analyze the supply and demand situation for major goods and services; 3) summarize monitoring efforts; and 4) identify areas where changes may be needed.

This summary is organized into the 15 major issues identified during the scoping or initial public involvement phase. The information will be used in revising the Forest Plan to identify areas where change may be needed in standards and guidelines, monitoring, or other areas, and in developing and analyzing management alternatives to consider in the Forest Plan revision. The following sections provide a summary of the major findings and areas where change may be needed.

## BIODIVERSITY

The biodiversity issue deals with maintaining the natural mix of plants and animals on the National Forests and Grasslands in Texas. Sub-issues included under this issue are natural values, old growth, special ecosystems, and management indicators.

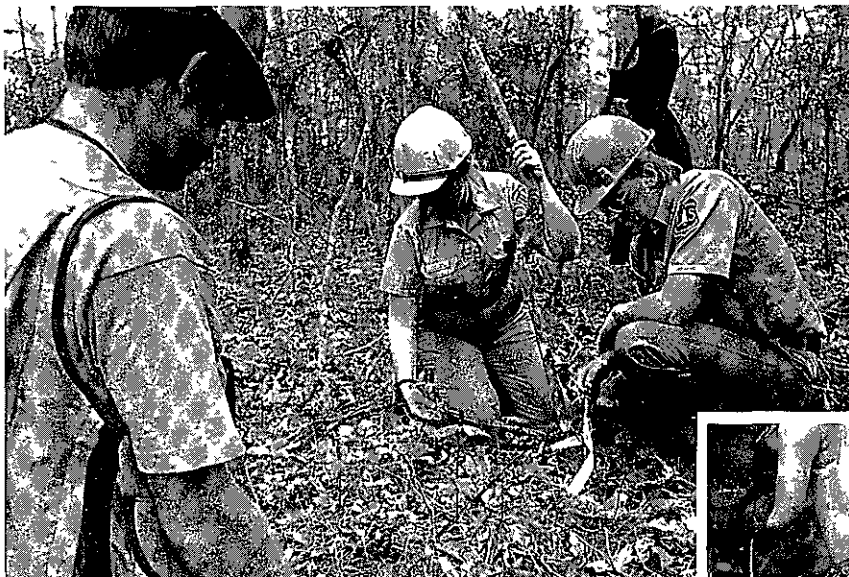


Photo Dale Bounds

Trillium in flower -  
Big Creek Scenic Area

Forest Service Botanist plots a Trillium colony in Big Creek Scenic Area, Sam Houston National Forest



Photo Dale Bounds



The National Forest Management Act requires maintenance of biodiversity on the National Forests. Biodiversity must be managed over landscapes as well as within and among forest stands, and for the more uncommon species.

In response to the concerns for biodiversity, the National Forests and Grasslands contracted with the Texas Natural Heritage Program to conduct an extensive inventory of rare or sensitive plants and exemplary plant communities. Seventeen plant communities and 34 sensitive or federally protected plant species were identified. An agreement between the Texas Nature Conservancy, the Texas Natural Heritage Program, and the National Forests in Texas was recently reached which will ensure a firm foundation of knowledge regarding these communities and species.

Natural values refers to native ecosystems as opposed to introduced plants, animals, and communities. Forest monitoring indicates there are about 4,000 acres of non-native species, primarily bermuda grass, on the Grasslands, and about 20,000 acres of slash pine on the Forests.

One of the difficulties in protecting old growth is defining and inventorying it. Forest stand age is only one factor of old growth; but it is readily available data and is a logical starting point for assessing old growth. The U. S. Forest Service Southern Region has begun work on defining old growth in the South; however, this work will not be completed for some time. Until a definition is finalized, age will be the main criteria used in identifying old growth. On the National Forests and Grasslands in Texas most older aged stands are loblolly and shortleaf, although hardwood stands have a greater proportion of trees in the older age classes.

## FOREST STAND AGE (Total Acres by Stand Age)

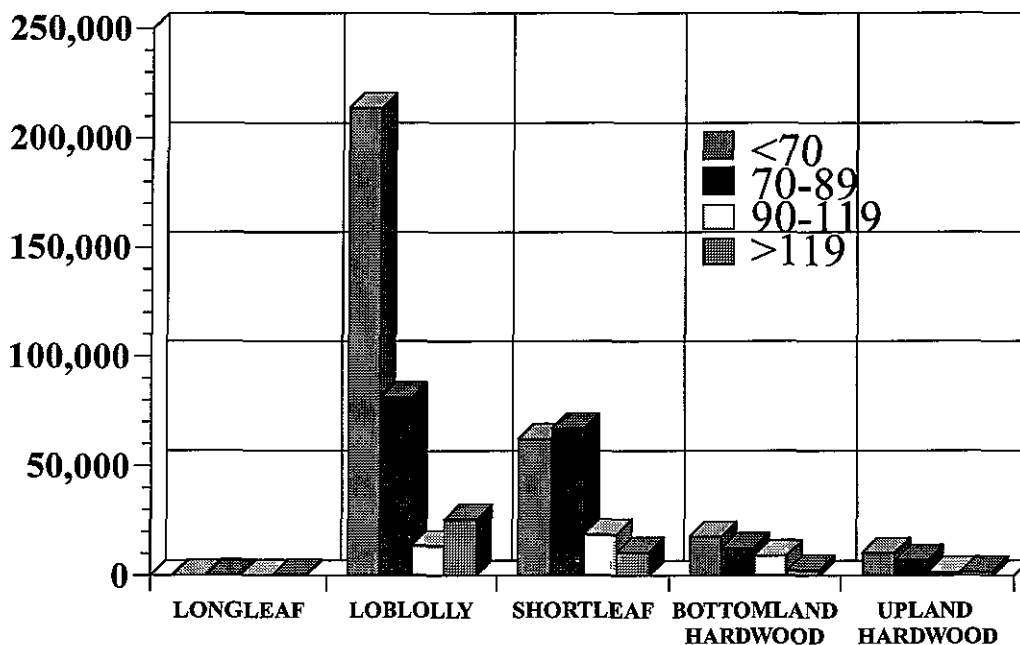






Photo Dale Bounds

Longleaf Pine - Sabine National Forest



Photo Jim Caldwell

Pitcher Plants - Angelina National Forest



Management indicators are used to assess the effects of management on an ecosystem. Recently there has been a move away from the restrictive term, "Management Indicator Species", so that ecological communities, as well as species, can be used as indicators of forest health. The current Forest Plan identified nine management indicators. Some management indicators were found to be too general or too difficult to monitor. Population monitoring has been limited to potential endangered and threatened species and major game species, through cooperation with the State of Texas. Models have been developed for some management indicators to evaluate habitat on certain areas of the forest; but these track capability rather than presence.

Areas where change may be needed regarding biodiversity include:

- Consider all species, communities, and ecosystems native to the National Forests and Grasslands in Texas.
- Consider all threatened, endangered, and sensitive species during the planning process.
- Re-evaluate management of non-native or exotic plants and animals.
- Identify past and present plant communities of the National Forests and Grasslands in Texas.
- Provide for old growth on the Forest.
- Prescribe more specific management for riparian areas, wetlands, and other ecosystems that require special management.
- Re-evaluate the Management Indicator selections.

## **VEGETATION MANIPULATION**

The vegetation manipulation issue includes timber harvesting methods, use of chemicals and prescribed fire, and mixed pine-hardwood forests management. The Forest Plan was amended to address concerns over vegetation manipulation. This Amendment #1 incorporated the decisions made in the *Final Environmental Impact Statement (EIS) on Vegetation Management in the Coastal Plain/Piedmont*. The EIS addressed vegetative management practices such as site preparation and chemical usage.

The Forest Plan called for even-age management using clearcutting 60 percent of the time. The remand of the Forest Plan directed that harvest methods would be determined through project analysis. Since 1987, the proportion of harvested area using the clearcut method is about what the Plan prescribes. The areas harvested include many acres contractually obligated prior to approval of the Forest Plan. Therefore, a better evaluation of plan implementation would be to use prescribed treatments. Using this as a reflection of Forest Plan implementation indicates much less acreage prescribed for clearcut, and a little less prescribed for seedtree or shelterwood than planned. In addition, 813 acres have been prescribed for uneven-age (selection) management whereas none was called for in our current Forest Plan.

The acreage commercially thinned has exceeded Forest Plan projections because of thinning needed to improve endangered red-cockaded woodpecker habitat. These areas are being thinned to different specifications than planned because of the Federal District Court order. More acres have been regenerated than projected because all regenerated acres, including southern pine beetle control acres are reported. The Forest Plan objective did not include these areas.

Fire is a useful management tool for controlling vegetation for range, timber, and wildlife management needs. Fewer acres have been prescribed burned than scheduled in the Plan because of a shift in resources to management for red-cockaded woodpecker, restrictive smoke management guidelines, inadequate budget, and unfavorable weather conditions. If this trend continues, the character of the Forest could change significantly.

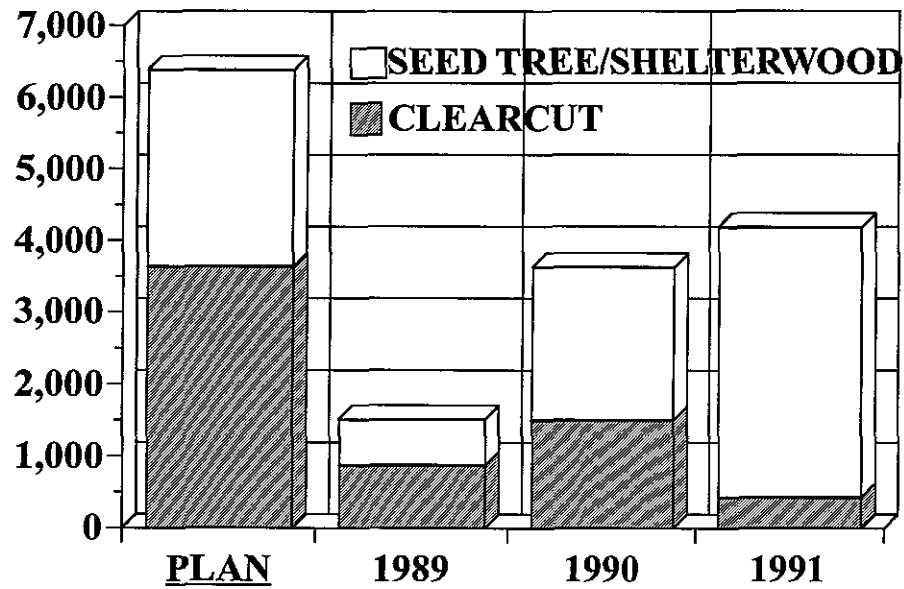




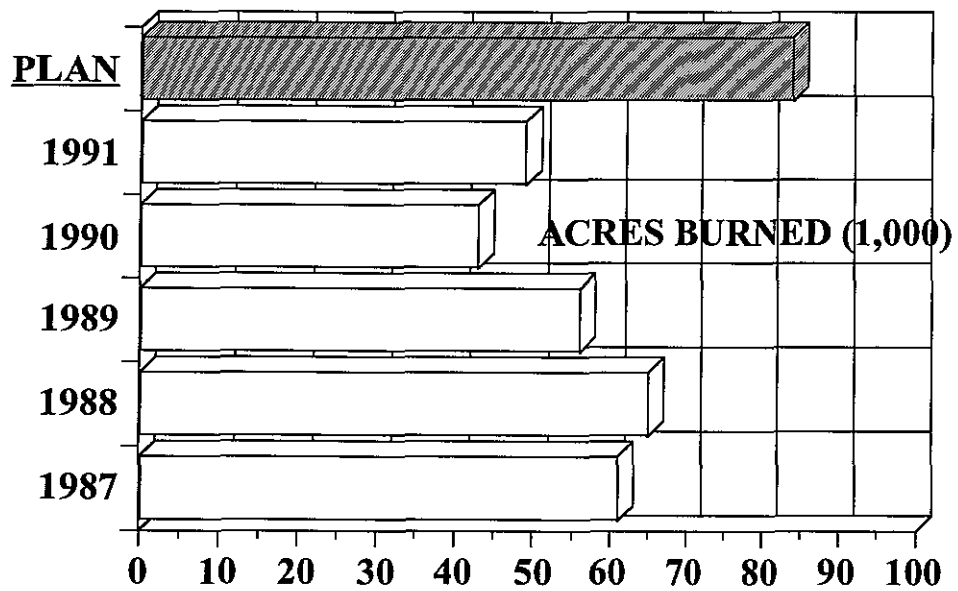
Photo Doug Bradberry



## HARVEST METHODS (Acres Prescribed)



## PRESCRIBED BURNING





Chemical uses for vegetation control was essentially stopped in 1987; however, the Forest Plan amendment incorporating the *Vegetation Management Environmental Impact Statement* allows the use of herbicides under controlled conditions. Very little herbicide use has occurred even with this authority. Research shows that uneven-aged management of southern pines requires use of herbicides; therefore, chemical use may increase if more uneven-aged management is initiated. Research on the 813 acres of uneven-aged management has already begun in an effort to further assess the need for herbicides.

**HERBICIDE USE ON NFGT 1981-84 AND 1986**  
(Pounds of Herbicide Used and Area Treated)

| Active Ingredient   | 1981                     | 1982                        | 1983                      | 1984                  | 1986                      |
|---------------------|--------------------------|-----------------------------|---------------------------|-----------------------|---------------------------|
| Bromocil            | --                       | 400 lbs<br>20 acres         | 160 lbs<br>8 acres        | --                    | --                        |
| Dalapon             | 30 lbs<br>5 acres        | --                          | --                        | --                    | --                        |
| Dicamba             | --                       | 15 lbs<br>3 acres           | --                        | 6 lbs<br>20 acres     | --                        |
| Endothall           | --                       | --                          | --                        | --                    | 16 lbs<br>1 acre          |
| Fosamine            | 650 lbs<br>49 acres      | 200 lbs<br>30 miles         | --                        | --                    | --                        |
| Glyphosate          | --                       | 4 lbs<br>1 acre             | 10 lbs<br>2.5 acres       | 20 lbs<br>5.5 acres   | --                        |
| Hexazubibe          | 35 lbs<br>58 acres       | --                          | 91.8 lbs<br>111 acres     | 537 lbs<br>404 acres  | 2,227 lbs<br>1,528 acres  |
| Picloram            | 75.4 lbs<br>217 acres    | 47.7 lbs<br>144 acres       | 31.5 lbs<br>185 acres     | *65 lbs<br>99 acres   | *197 lbs<br>1,093 acres   |
| Prometon            | --                       | *2.1 lbs                    | --                        | --                    | 0.5 lbs<br>1 acre         |
| Simazine            | --                       | *0.3 lbs                    | --                        | --                    | --                        |
| Sodium Chlorate     | --                       | *16.8 lbs                   | --                        | --                    | --                        |
| Sodium Metaborate   | --                       | *21 lbs                     | --                        | --                    | --                        |
| Sufometuron Methyl  | --                       | --                          | --                        | --                    | 10 lbs<br>1,948 acres     |
| Triclopyr           | --                       | --                          | --                        | --                    | 1 lb<br>2 acres           |
| 2,4-D               | *1,330.5 lb<br>451 acres | *1,209.3 lbs<br>1,121 acres | *1,282 lbs<br>1,318 acres | *398 lbs<br>156 acres | *1,539 lbs<br>1,573 acres |
| Total Acres Treated | 780 Acres                | 1,289 Acres                 | 1,624 Acres               | 6,845 Acres           | 6,146 Acres               |

\* Some amounts of these herbicides were applied as a single mixture with other herbicides.



### PESTICIDE USE ON THE NFGT, 1987 - 1991

| Year | Type        | Active Ingredient      | Control Objective    | Pounds Used | Application Method |
|------|-------------|------------------------|----------------------|-------------|--------------------|
| 1987 | Herbicide   | 2,4-D/amine            | Range Veg. Improv.   | 210         | Ground             |
| 1988 | —           | —                      | —                    | —           | —                  |
| 1989 | —           | —                      | —                    | —           | —                  |
| 1990 | Insecticide | Chlorpyrifos (Dursban) | Southern Pine Beetle | 168         | Backpack Sprayer   |
| 1991 | Insecticide | Chlorpyrifos (Dursban) | Southern Pine Beetle | 12          | Backpack Sprayer   |

SOURCE: NFGT, Annual Pesticide Use Report (FS-2100-1) 1987-1991

There is high interest in management of our forests as pine, hardwood, or mixed pine-hardwood by both the public and Forest Service managers. Inventory and historical records indicate mixed pine-hardwood is the most common ecosystem found naturally on the Forest. The Forest Plan calls for both pine and hardwood management types on the Forest, but not mixed pine-hardwood. There are 16,000 acres of forest in mixed forest type (at least 30 percent pine and 30 percent hardwood). Current direction is to provide for mixed stands by retaining up to 30 percent pine in hardwood stands and up to 30 percent hardwood in pine stands. Forest policy changed in 1991 to clearly state the objective that clumps of hardwoods will be retained to achieve 30 percent hardwood composition in pine stands. Monitoring and recent research studies on the Forest indicate that hardwoods are being regenerated and maintained in harvest units.

The areas where changes may be needed are:

- Re-evaluate the prescribed burning program. Clearly identify costs and needs for fire management, wildlife improvement, range improvement, and timber management.
- Consider allowing prescribed fire in wilderness for maintenance of fire-dependent ecosystems and restoration of its natural role.
- Re-evaluate the mix of harvest and regeneration systems in the revision.
- Include southern pine beetle induced regeneration in the Plan's regeneration objective.
- Consider establishing mixed management types on some of the Forest.
- Incorporate direction from the *Vegetation Management Environmental Impact Statement* regarding use of herbicides.

### SPECIAL MANAGEMENT AREAS

The special management areas issue includes the sub-issues of special management areas protection, wilderness allocations, wilderness management and wild and scenic rivers.

The Plan provides for several special management areas. These include one research natural area (370 acres), five wilderness areas (37,162 acres), five scenic areas (2,840 acres), and one protective corridor along the Neches River (1,165 acres). Two additional wilderness areas, four research natural areas, two scenic areas, ten special management areas, four special interest areas, and fifteen botanical areas have been proposed since the Forest Plan was completed. Most were proposed because they contain a quality example of one or more of the 17 plant communities identified in the Texas Natural Heritage inventory.





Photo Dale Bounds

Photographer on the Lone Star Trail, Little Lake Creek Wilderness Area, Sam Houston National Forest

Research natural areas are part of a national network of ecological areas designated for research or to maintain biological diversity. Past and continuing use, especially recreation, has degraded the pristine nature of the Cross Timbers Research Natural Area. This has occurred because funding has been inadequate to implement necessary preventive practices.

Scenic areas have outstanding natural beauty requiring special management to preserve these characteristics. During monitoring we found that we are managing more acreage as scenic areas than shown in our Forest Plan because of boundary discrepancies. These boundaries need to be established and the acreages adjusted. Southern pine beetle control in the Big Creek Scenic Area has been controversial. Forest Plan scenic area direction and guidelines need to be clarified regarding SPB control.

Nearly 2,000 acres of wilderness have been added through land exchange and purchases since 1987. Sixteen areas were considered during Roadless Area Review and Evaluation. Five high quality areas became wilderness in 1984. Essential parts of three others became scenic areas. No new roadless areas have been acquired or defined on the Forest, but Longleaf Ridge and the Big Creek area are suggested for proposed wilderness.

The southern pine beetle is having an impact on wilderness character. About five percent of the Indian Mounds Wilderness was infested in 1990. Pine beetle control to protect red-cockaded woodpecker habitat in wilderness has been controversial. In 1990, 183 southern pine beetle spots affecting 795 acres of wilderness were reported. Eleven of these bug spots were controlled by felling and leaving the affected trees. In





Photo Dale Bounds

Boykin Creek - Angelina National Forest

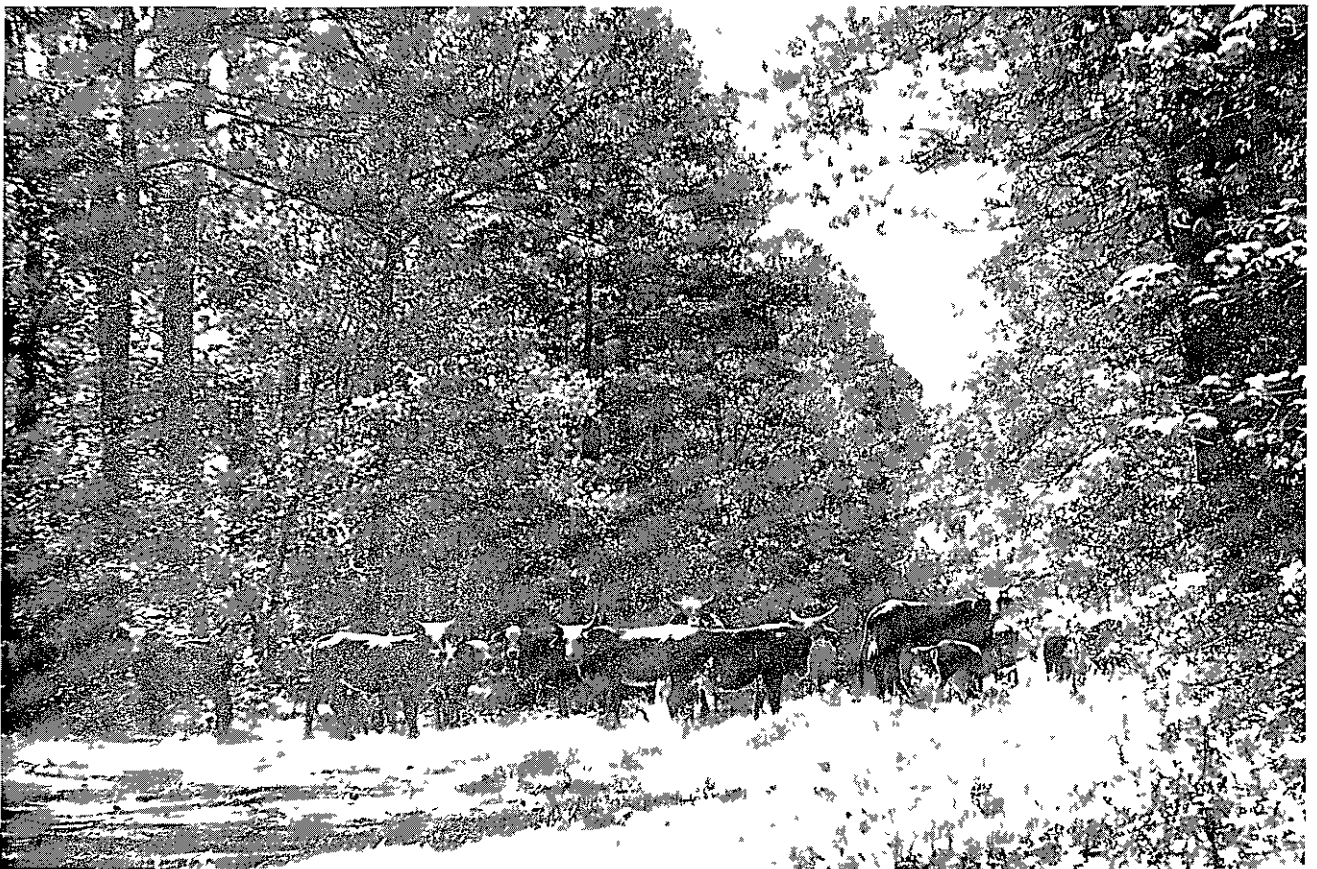


Photo Dale Bounds

Grazing - Sam Houston National Forest



1991, 82 southern pine beetle spots affecting 510 acres were reported. Two spots were treated with successful actions in stopping the spread of southern pine beetles in the woodpeckers habitat on 26 acres. Other spots were monitored but did not require action to protect the red-cockaded woodpecker's habitat.

Prescribed fire is being evaluated to maintain fire-dependent ecosystems and rare plants in wilderness areas. Monitoring indicates recreation use in wilderness areas is slowly increasing and ranges from 10 to 25 percent of capacity.

The Wilderness Management Unit of Missoula, Montana studied visitor use in Upland Island Wilderness Area between October 1989 and February 1990. This study documented wilderness visitor perceptions and a profile of the type of visitors that used the area. The study found use to be relatively light, mostly day use, and primarily associated with hunting during that 65-day sample period.



Photo Dale Bounds

Canoeing the Neches River

The Neches River corridor is managed as a protective area; however, several wildlife and recreation projects have been proposed within this corridor. Standards and guidelines within the current Forest Plan are not clear as to whether these are permitted. The Five-Year Review identified that this should be clarified in the Forest Plan's revision. The State of Texas is the lead agency in determining the river's suitability as a wild and scenic river; however, no action is anticipated in the near future. The Angelina River below Sam Rayburn Reservoir has also been proposed as a wild and scenic river. The potential classification of these rivers as wild, scenic, or recreational, or a combination of these has not been determined.



A summary of areas where changes in management direction for special areas may be needed include:

- Formally evaluate the four proposed research natural areas and consider them in the revision, if eligible.
- Consider actions to reduce conflicts between incompatible uses and research natural area management.
- Clearly delineate existing scenic areas' boundaries.
- Review southern pine beetle control direction in special areas.
- Develop a range of alternatives to consider proposed special areas.
- Develop a range of alternatives to consider the remaining 11 areas from Roadless Area Review and Evaluation (RARE II) areas and Longleaf Ridge as wilderness.
- Clearly state the criteria for southern pine beetle control in the wilderness standards and guidelines.
- Separate management areas for different ecosystems in wilderness areas, protective corridors, and other special management areas.
- Consider management prescription requirements for wilderness area ecosystems for threatened and endangered species.
- Assess the eligibility and determine potential wild and scenic classification of the Neches and Angelina Rivers.

## **OFF-ROAD VEHICLES**

The Off-Road Vehicles (ORV) issue includes use, management, and ORV trails on the Forest. Strong concerns have surfaced over conflicts with other users, safety concerns, and environmental damage.

ORV use has increased annually and is over 30 percent greater than 1987 estimates. ORV use is heavy, particularly on the Raven District of the Sam Houston National Forest where 55 miles of designated ORV trails exist. The current Forest Plan calls for 250 miles of designated ORV trails to be located exclusively on the Sam Houston National Forest. The Angelina, Davy Crockett, and Sabine National Forests have been managed as "open cross country", except for special areas closed to ORVs, and account for approximately 250 additional miles of undesignated trails. Monitoring indicates ORV use has created some adverse soil and water impacts and conflicts are occurring in these unrestricted areas. A designated trail system should reduce conflicts with other recreational activities.

*Constraints have been placed on off-road vehicle use to prevent potential environmental damage, especially near one of the largest endangered red-cockaded woodpecker populations on the Raven Ranger District.*

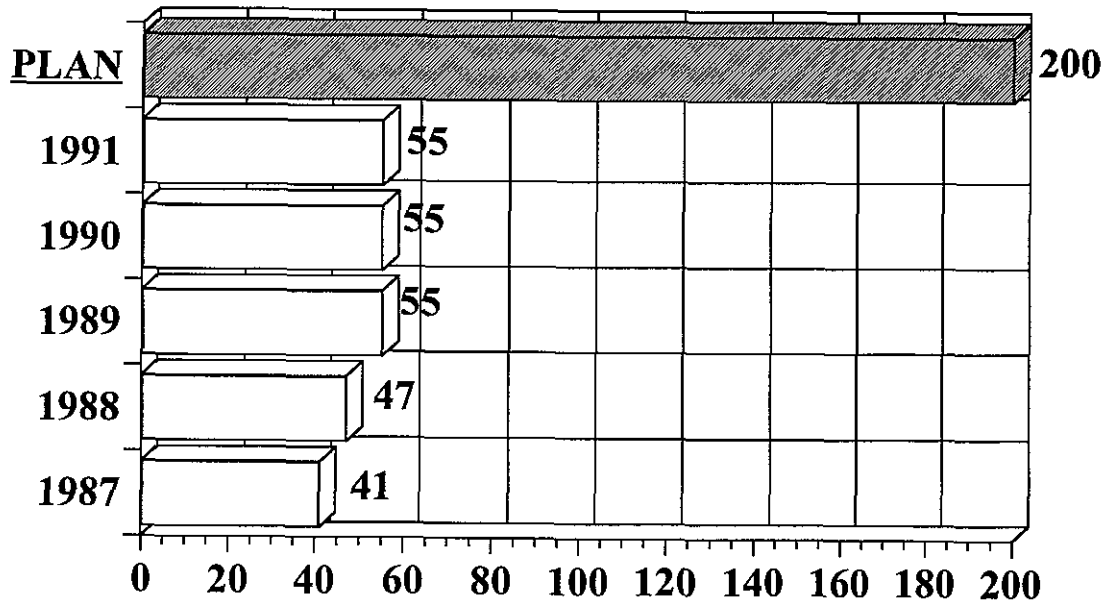
Major areas where changes may be needed are:

- Consider a Forest-wide ORV plan and permit system.
- Develop better monitoring of ORV impacts on soil and water.
- Reduce conflicts through enforcement, zoning, and clear regulations.
- Develop specific standards and guidelines to reduce impacts of ORVs.



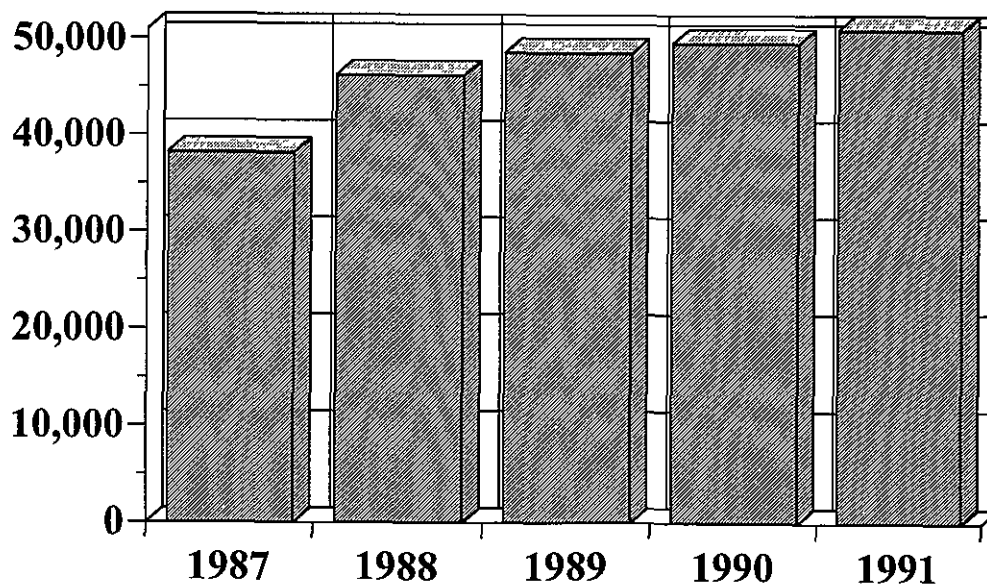
## OFF ROAD VEHICLE TRAILS

(Miles of Designated Trail)



## OFF ROAD VEHICLE USE

(Estimated Use In Recreation Visitor Days)





## RED-CKOKADED WOODPECKER

The endangered red-cockaded woodpecker has been an issue for a number of years. Sub-issues include management for the woodpecker, and how this will be addressed in the Forest Plan Revision.



Adult red-cockaded woodpecker

Photo Jim Caldwell



Young red-cockaded woodpecker about to fledge

Photo Jim and Laura Lee

No single wildlife species has had a greater effect on southern forest land management than the red-cockaded woodpecker. Currently, about 190,000 acres of the Forest is managed for the endangered woodpecker in contrast to 80,000 acres in the 1987 Plan. The effect of management emphasis for woodpeckers has significantly altered the ability of the Forest to produce planned outputs. More red-cockaded woodpecker habitat improvement has been accomplished than was forecast in the 1987 Plan. Although there are differences across the four National Forests, woodpecker populations have stabilized over the last few years after a slow decline. The Sam Houston National Forest accounted for 59 percent of all active colonies in 1986 and 68 percent in 1991. The Sabine National Forest has shown a decline from 24 active colonies in 1986 to 10 in 1991. Budget expenditures for red-cockaded woodpecker have greatly exceeded Forest Plan projections as discussed in the section on wildlife and fisheries. The number of structures established for threatened and endangered wildlife species, from 1988 to 1991, greatly exceeded planned levels.

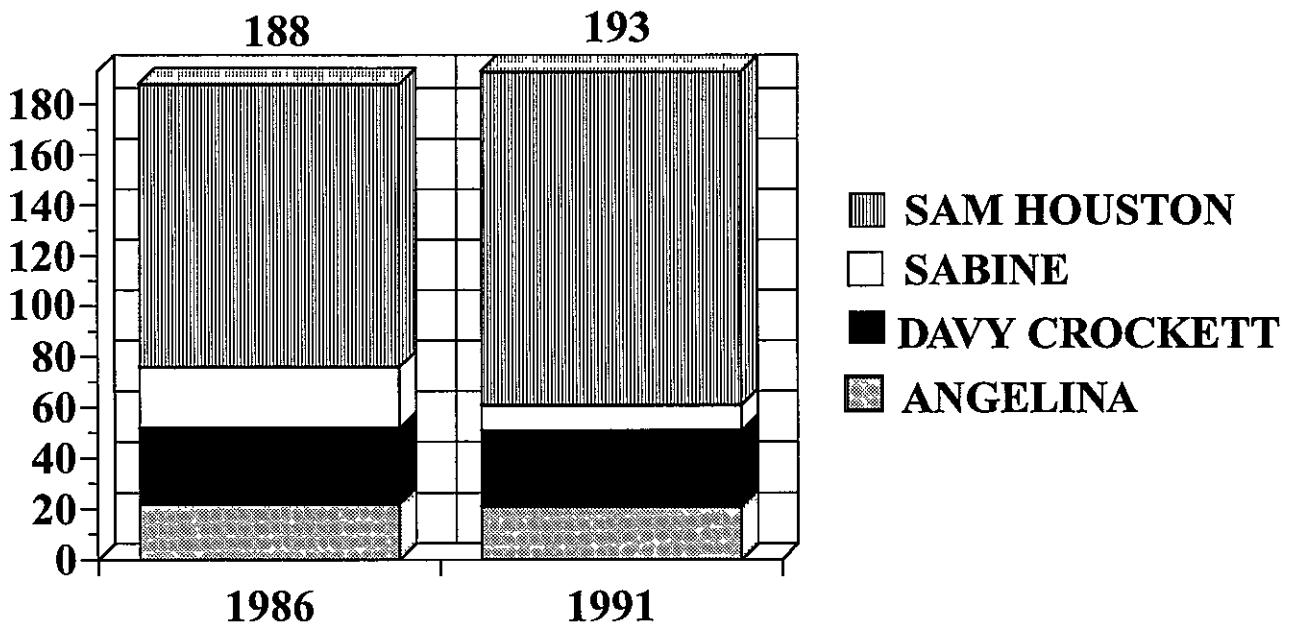
The Regional Forester recently issued a decision to amend the Forest Plan to incorporate the Interim Guides for management of the red-cockaded woodpecker. This decision was appealed and is now pending resolution.



Areas where change may be needed include:

- Incorporate the long-term strategy for red-cockaded woodpecker in the revision.
- Management and monitoring information in more detail is needed in the Forest Plan.

## RED-COCKADED WOODPECKER (Active Colonies by Forest)



### INTEGRATED PEST MANAGEMENT

Integrated pest management covers many more things than the primary concern of prevention and control of southern pine beetles. Sub-issues include southern pine beetle control measures and how they will be addressed in the Forest Plan Revision. Southern pine beetle outbreaks in wilderness and scenic areas have made control a hotly debated issue. Mature trees in wilderness and scenic areas are more susceptible to, and many are succumbing to, beetle outbreaks.

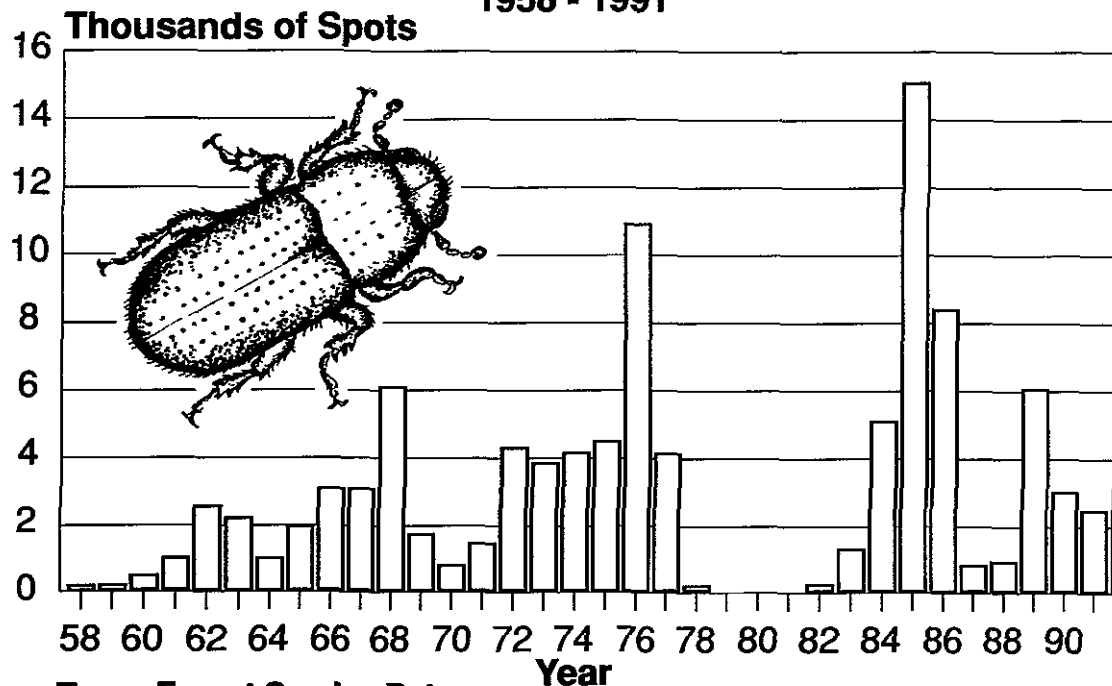
The *Notice of Intent* for the Forest Plan revision **excluded actions to control** southern pine beetle from the scope of the analysis. The *Record of Decision for the Southern Pine Beetle Environmental Impact Statement* was signed by the Chief of the Forest Service on April 6, 1987. No new information was expected in 1990 which might change the decisions made, but changes may be made in risk reduction and prevention.

Major pine beetle epidemics occurred in 1984 and 1985, and a large epidemic occurred in 1989, with lesser epidemics in 1990 and 1991.



# SOUTHERN PINE BEETLE INFESTATIONS -- TEXAS

1958 - 1991



## Texas Forest Service Data

**INSECT CYCLES** The southern pine beetle, about the size of a half-grain of rice, kills thousands of trees in East Texas each summer. Scientists expect an active season in 1992

Dense old pine stands and other pine trees under stress are at greater risk to southern pine beetle infestations. Due to the large acreage of older loblolly and shortleaf pine and the cyclic nature of major pine beetle outbreaks, another large epidemic is expected this year or next.

Many techniques have been employed to reduce risk, control outbreaks, and to prevent infestations from spreading to private lands. The current southern pine beetle hazard rating system is based on forest type, method of cut, and condition class. Research shows that stand height, pine basal area, and species more accurately reflect hazard. In recent years southern pine beetles have had a major influence on timber outputs as reflected in expenditures for control, and the increased salvage cuts



| <b>Year</b> | <b>Expenditures</b> |
|-------------|---------------------|
| 1987        | \$119,784           |
| 1988        | \$82,060            |
| 1989        | \$1,148,301         |
| 1990        | \$ 581,308          |
| 1991        | \$ 262,354          |

A summary of areas where change may be needed follows:

- Clarify in the Forest Plan direction and implementation given in the Southern Pine Beetle Environmental Impact Statement.
- Clarify southern pine beetle control techniques with more detail and ensure reduced conflicts with other resources.

## **ROADS AND TRAILS**

Access to Forests and Grasslands is provided through a roads and trails system. Monitoring shows more miles of trail have been constructed than planned. This was largely due to successful partnerships in trail building. Although the overall trail system miles exceeds projections, the mix of trail types being provided is not what was planned.

The transportation network is composed of state, county, and Forest Service roads. These roads serve administrative and resource management needs and provide public access to the Forest.

### **CURRENT INVENTORIED ROAD MILEAGE**

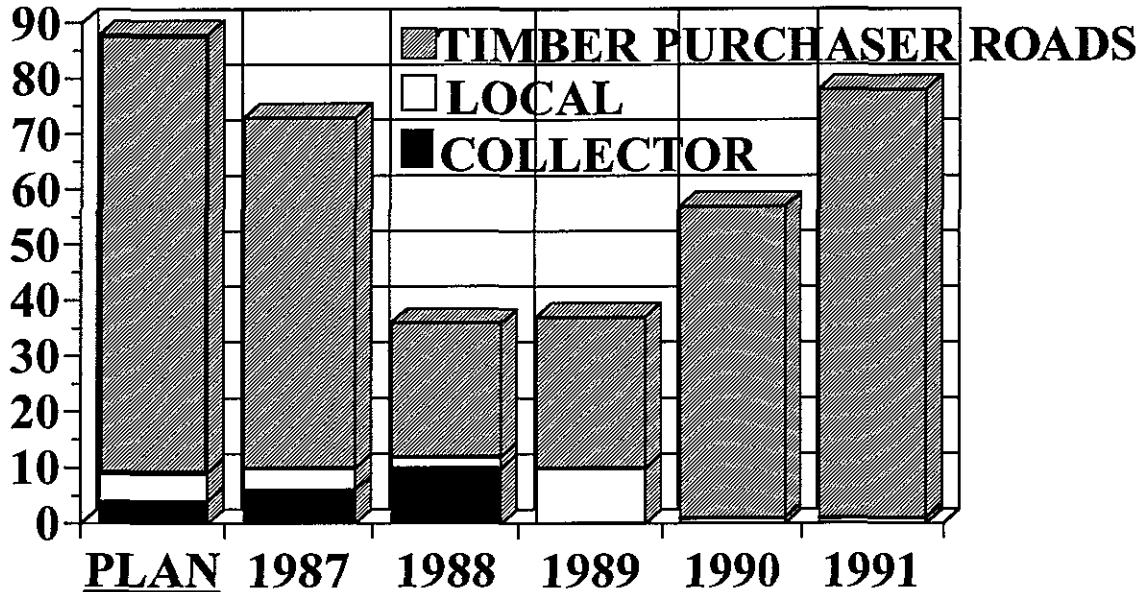
| <b>Jurisdiction</b> | <b>Forest Arterial</b> | <b>Forest Collector</b> | <b>Forest Local</b> | <b>Total</b> |
|---------------------|------------------------|-------------------------|---------------------|--------------|
| State               | 768                    | 347                     | 111                 | 1,226        |
| County              | 11                     | 185                     | 576                 | 772          |
| USDA, FS            | 31                     | 252                     | 2,084               | 2,367        |
| Total Miles         | 810                    | 784                     | 2,771               | 4,365        |

The timber sale road construction and reconstruction program has not proceeded at planned levels due to the impacts from red-cockaded woodpecker habitat management, appeals, litigation and budgetary limitations on the timber sale program. Most road work projected in the 1987 Forest Plan was for reconstruction. The miles to be constructed and those to be reconstructed is not clearly defined. Road closures, obliteration, traffic management, and maintenance requirements need to be more clearly addressed.



# ROAD CONSTRUCTION

(In Miles)



The protection of trails and adjacent areas from southern pine beetle control activities, and conflicting trail use is a major concern. Limited funding for trail maintenance and repair has not had a major impact on trail use.

There are 55 miles of designated off-road vehicle trails, 52 miles of horse trails, about 170 miles of hiking trails and a 12-mile canoe trail. There are more hiking trails, but as described in the off-road vehicle issue, there are far fewer miles of off-road vehicle trails than planned.

*Areas where change may be needed include:*

- Incorporate travel management direction in the revision
- Clarify road construction and reconstruction objectives in the revision.
- Consider relocating trails or separating conflicting trail use.





Photo Bob Neland

Davy Crockett National Forest

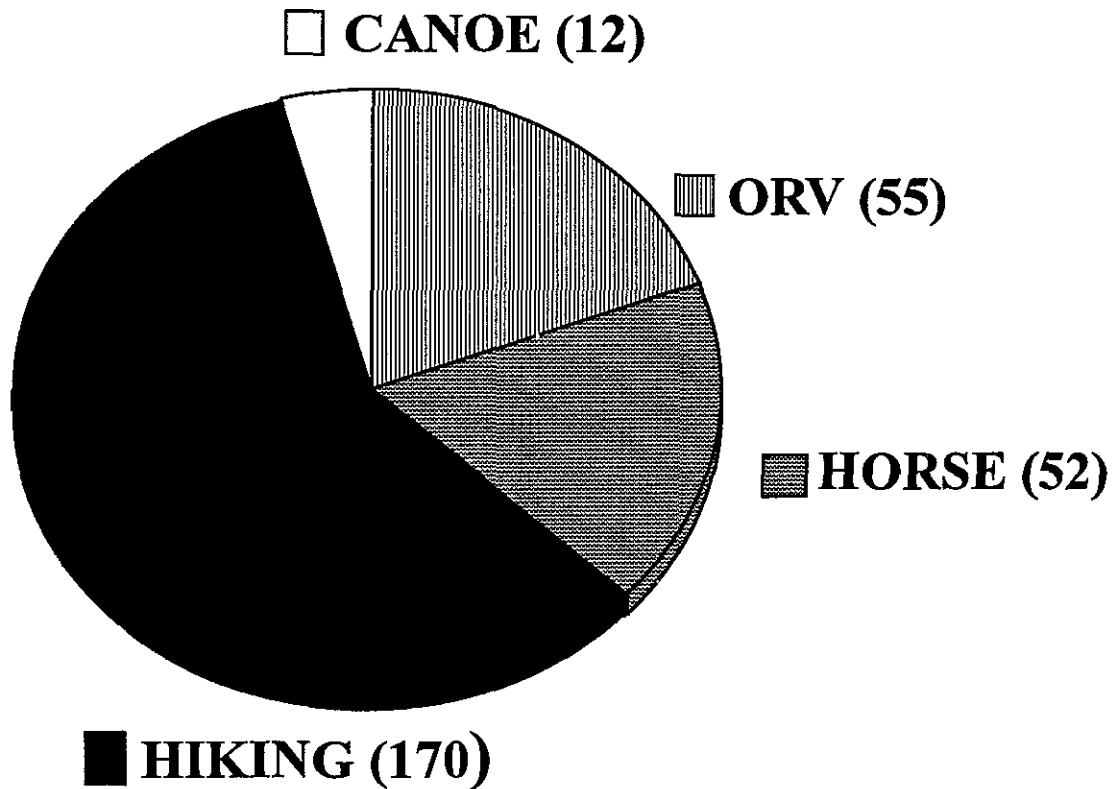


Photo Dale Bounds

Sam Houston National Forest



# TRAIL MILES



## COMMUNITY STABILITY

National Forests' management activities can effect our neighbors. This community stability issue includes concern for the local economy, jobs, and county revenues. Twenty-five percent of all receipts from the National Forests and Grasslands are returned to counties for schools and roads where the lands are located. Returns to counties have been less than anticipated, largely due to decreased timber sale receipts, but oil and gas development and production is increasing more than expected.





Photo Dale Bounds

Professional team looking at Longleaf stand, Angelina National Forest.

*A detailed Socio-Economic Overview for the National Forests and Grasslands in Texas* was prepared for the revision. This document is part of the Five-Year Review/Analysis of the Management Situation but is produced as a separate document. The Socio-Economic Overview is available for review at District offices and at the Forest Supervisors office in Lufkin. A summary of that document follows:

Counties around the Sam Houston National Forest and the LBJ National Grasslands are becoming increasingly urban. By contrast, counties around the Caddo National Grasslands and the Angelina, Davy Crockett, and Sabine Forests remain more rural. In general, the rural Forest and Grassland counties have lower per capita incomes, higher poverty rates, and lower levels of education when compared to more urban counties. These differences suggest different priorities on Forests near urban areas than for those Forests in rural areas. Differences in land use, demographics, employment, recreation opportunities, education, and in attitudes of residents indicate that rural communities have different wants, needs and desires from the Forest than more urban areas.

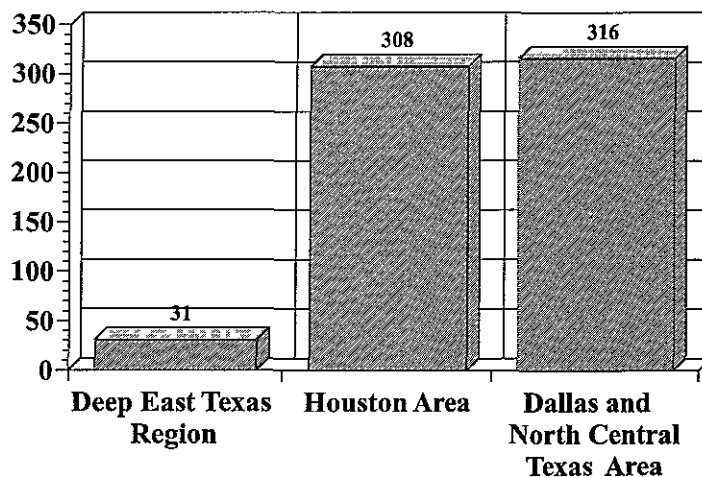
Ninety-five percent of Texas' productive timberland is located in East Texas. Forest ownership is predominantly in the hands of private landowners (60 percent). Companies involved in the manufacturing of wood-based products own 33 percent, while public ownership amounts to less than 7 percent of the timberland in East Texas. Only two other states, Maine and Florida, have higher percentages of industrial ownership of forest lands. Public ownership includes U.S. Forest Service lands (5 percent), State Parks and Wildlife Management areas, and the Texas Forest Service. Because of limited public ownership of timberlands in



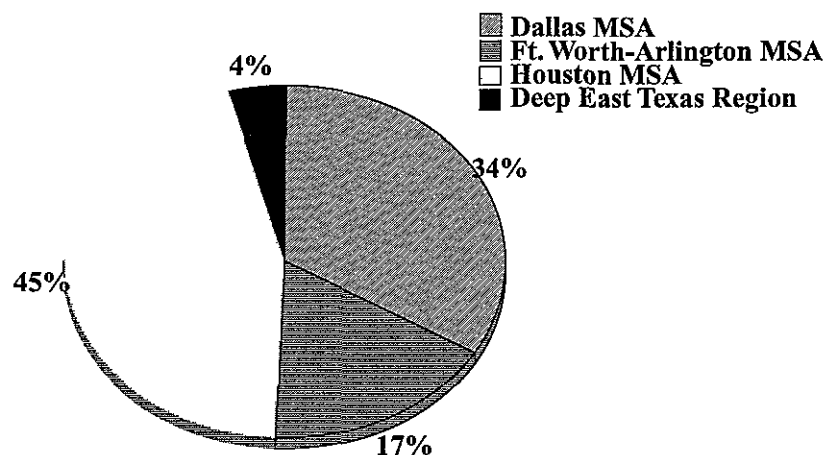
Texas, management of the National Forests and Grasslands residents and visitors have strong concerns about the multiple uses of those lands and the benefits they expect.

Considerable demographic differences are obvious between rural areas and the more urban areas of Houston, Dallas, and Beaumont. The population of Texas is predominantly young and ethnically diverse. Rural areas differ markedly having more residents in the older age groups and less ethnic diversity than urban areas.

### POPULATION DENSITY (Persons per Square Mile)



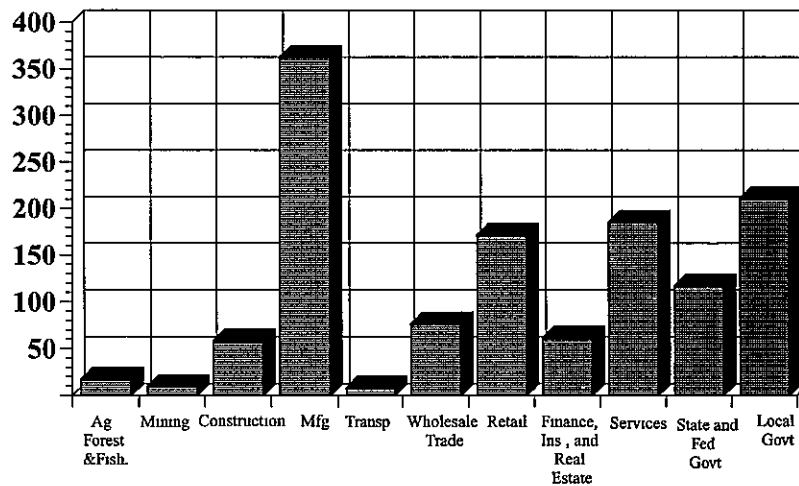
### POPULATION DISTRIBUTION IN AREAS SURROUNDING THE NATIONAL FORESTS AND GRASSLANDS



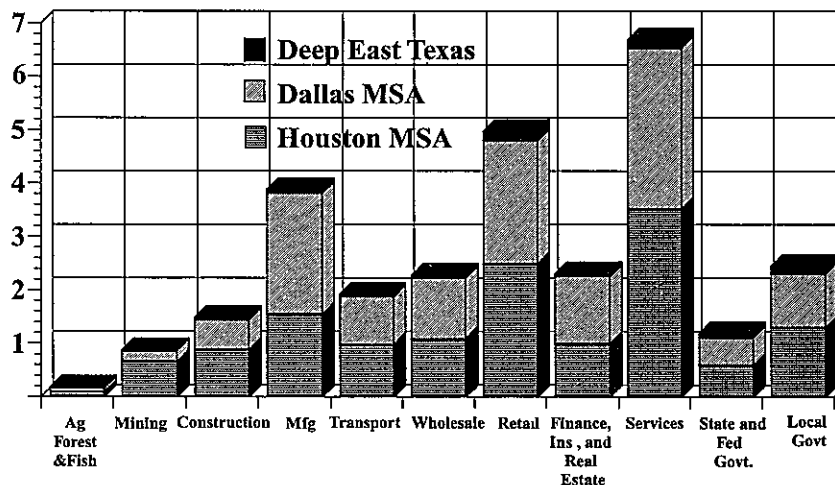


Many rural Forest counties depend heavily on wood-based manufacturing, whereas urban areas are more diversified. Three-quarters of the new jobs created in Texas during the next decade will be in the service industries. Yet the importance of various sectors of the economy varies tremendously from region to region. The rural region of Deep East Texas encompasses the Angelina, Davy Crockett, Sabine, and part of the Sam Houston National Forests. Within Deep East Texas, manufacturing, which includes the wood-based industries, accounts for the majority of wages. In 17 of the 43 counties in East Texas, wood-based manufacturing is the largest of all manufacturing industries.

**EMPLOYMENT IN VARIOUS SECTORS  
OF THE ECONOMY  
IN THE DEEP EAST TEXAS REGION**  
(1,000's of Dollars in Wages)



**EMPLOYMENT IN VARIOUS SECTORS OF THE  
ECONOMY**  
(100,000's of Individuals Employed)



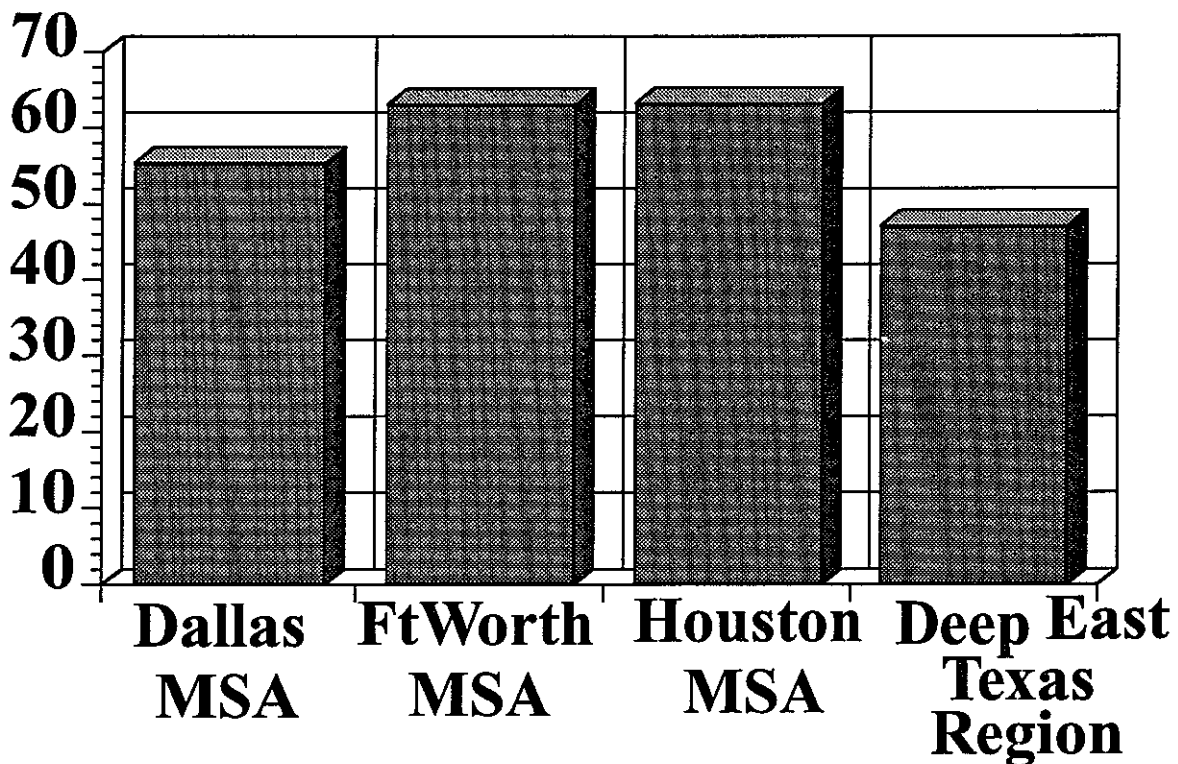


Outdoor recreation opportunities are abundant in Deep East Texas (1.919 acres per person), and developed recreation land (0.024 acre per person) is plentiful compared to other regions of Texas. The National Forests, particularly the Sam Houston, are increasingly seen as an outdoor recreation destination by urban residents. Outdoor recreation is a major concern to residents of Houston; both outdoor recreation opportunities (0.083 acre per person), and developed recreation (0.005 acre per person) are in great demand. In the Dallas and Fort Worth areas outdoor recreation opportunities are limited (0.032 acre per person) and developed recreation (0.009 acre per person) is in great demand.

Education provides citizens with basic skills and knowledge necessary to function in society and provides a resource pool of skilled individuals to the community. The educational attainment of rural residents is generally lower than that of urban residents. Education attainment levels of residents of the 12 Deep East Texas counties are, in general, below the statewide levels of attainment. The percentage of the population with 12 years, or more, of schooling ranges from 38.2 to 57.9 percent in Deep East Texas. Urban areas meet or exceed the statewide averages for educational attainment.

## **EDUCATIONAL ATTAINMENT IN SURROUNDING REGIONS**

**(Percentage of Residents Over Age 25 Having  
at Least 12 Years of Schooling)**





Research indicates that attitudes toward the environment differ from rural to urban areas. The attitudes of Americans toward the environment have changed as their relationship to the land has changed over time. Historically the utilitarian position was commonly taken by farmers, miners, and lumbermen, while the preservationist position was taken by urbanites. A positive association has been shown between environmental concern and involvement in outdoor recreation; each recreation group is concerned with enhancing the conditions for its particular activity. A recent University of California study examined the attitudes in rural communities relating to the timber/forestry crisis facing California. Residents experienced emotional distress and feared the loss of lifestyle that brought them to these rural communities. They lay blame on state agencies, the Forest Service, big industry, Congress and the state legislature. Locals are angered by decisions being made by people and institutions outside of the area, whether it is in a corporate boardroom or in the Nation's Capitol. Researchers saw the cause of the distress to be the result of uncertainty brought about by the issues and the inevitability of changes it will bring. These same feelings of fear and uncertainty were found among small sawmill owners in East Texas. Most of the small sawmill owners in East Texas depend heavily on high quality pine sawlogs from the National Forests. These sawmills receive half, or more, of their raw material from National Forests. Some of these sawmill owners stated they would go out of business without National Forest timber.

The impact of reduced timber harvest on the Forest is a concern to local communities. The majority of payments to counties is generated by timber harvest while receipts from other activities are smaller. Recreation payments comprise a very small portion. Reduced levels of timber harvest and grazing have caused receipts to the treasury to be less than projected in the Forest Plan. Payments to counties are used for roads and schools within the county. The more dependent counties include: Houston, Sabine, San Augustine, and Trinity. In the most dependent counties, payments have comprised up to about four percent of the school budgets and as high as 35 percent of the road and bridge budgets.

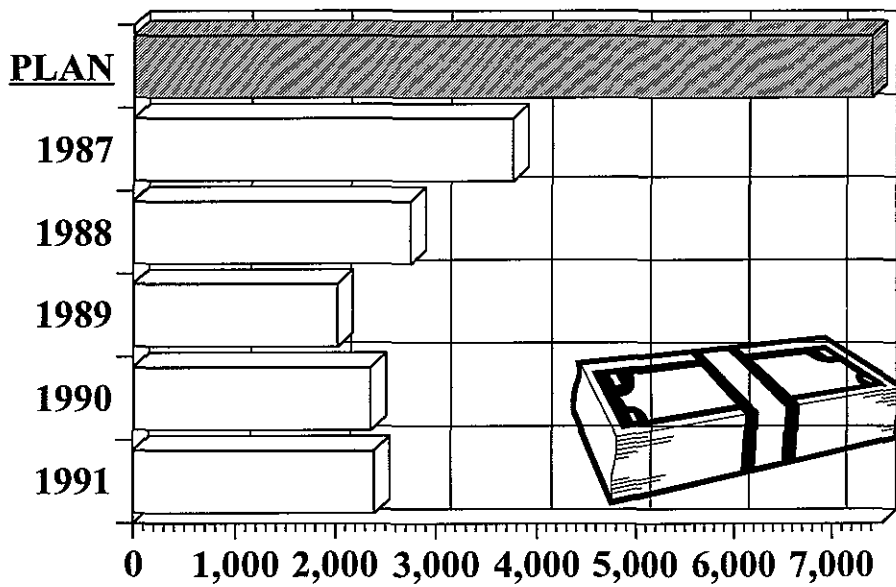
Although 25 percent payments to counties have been much less than projected, most Forest payments exceeded the taxes paid from private timber lands when per acre payments are compared. When the average per acre tax for private timberlands enrolled under current use valuation in 1987 was compared to the average per acre return from receipts from the four National Forests, it was found that all Forests except the Sam Houston National Forest exceed average per acre tax from private timberlands. It should be noted that data on average per acre tax paid for private timberlands enrolled under current use were available for 1987 only. 1987 was a high timber production year for the National Forests.

A summary of areas where change may be needed follows:

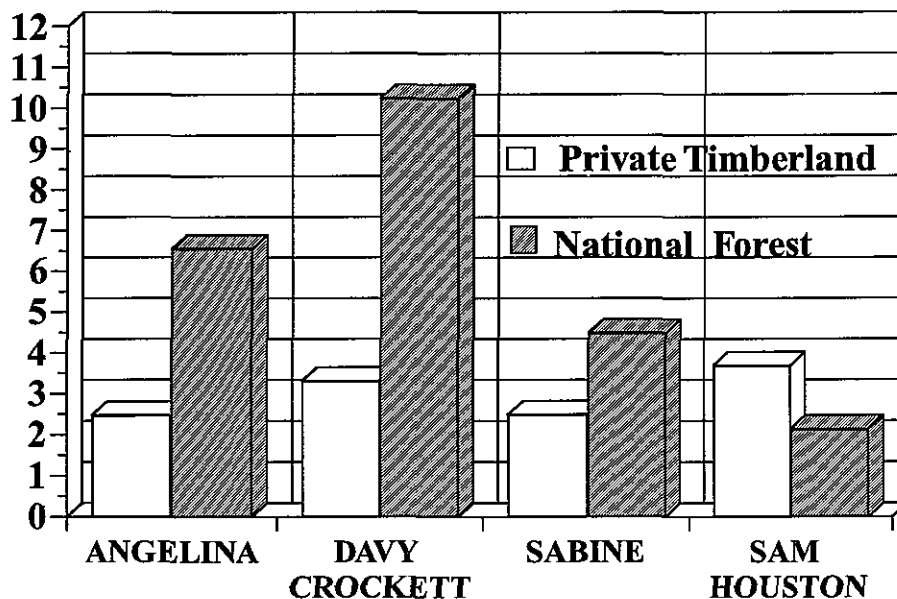
- Assess the impact of each alternative on returns to counties.
- Consider alternative(s) which maximize returns to counties.
- Consider alternative(s) which maximize returns to the most dependent counties.



# **ACTUAL RETURNS TO COUNTIES (In Thousands of Dollars)**



## **PER ACRE PAYMENTS TO COUNTIES \* 1987**



\*Average per acre tax from private timberlands enrolled under current use valuation are compared to average per acre returns to counties from the National Forests



## WILDLIFE AND FISHERIES

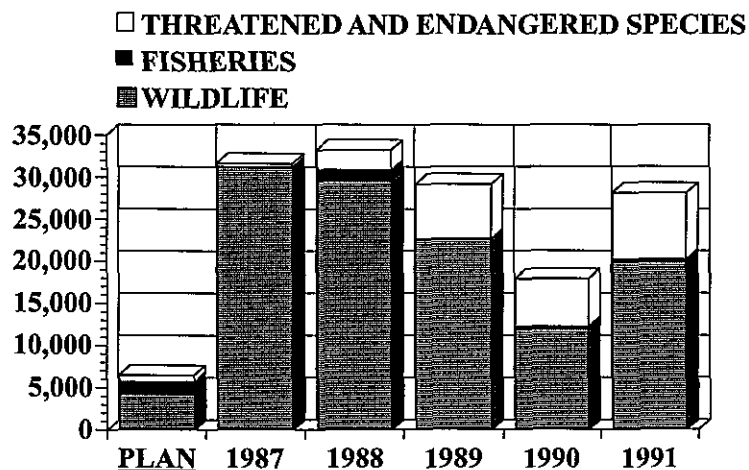
This issue is concerned with extirpated and introduced species, fish and aquatic resource management, threatened, endangered, rare or sensitive species (excluding red-cockaded woodpecker which was treated as a separate issue), and wildlife management.

Extirpated species are those which were once native to the area but are no longer found. While extirpated species such as bison and red wolf are well documented, less notable reptiles and amphibians are not known. Some species, such as the mountain lion or black bear, still occur in Texas but have been extirpated from the East Texas area. The Texas Parks and Wildlife Department and the U. S. Fish and Wildlife Service have responsibility for reintroduction of species. A program to consider reintroduction of Louisiana black bear is being considered by the Texas Parks and Wildlife Department. Developments will be closely monitored for the duration of the Forest Plan revision process. The Forest Service will continue cooperation with Texas Parks and Wildlife in reintroduction of eastern wild turkey. Monitoring indicates population levels of eastern wild turkey are growing.

Fisheries improvements have not been at levels stated in the plan. These were found to be too optimistic given current manpower and funding. There are 353 miles of perennial streams in the Texas National Forests; 160 are designated fishable, warm water streams. Fishable ponds and lakes account for approximately 1,786 surface acres, and public demand for fishing is high. In 1990 demand for fishing, as expressed in recreation visitor days, was more than three times that for hunting. During the 1987 Forest planning process, 90 species of fish were identified on the National Forests and 77 on the National Grasslands. In a recent survey of nine perennial streams on the Davy Crockett National Forest, three additional species were found.

Standards and guidelines for management stated in the 1987 Forest Plan did not address proposed, state-listed or sensitive species. Proposed, endangered, threatened and sensitive faunal species were limited to those listed federally. Since the Forest Plan was approved, additional species have been identified as sensitive or protected including three endangered, one threatened, 18 Category 2, six state-listed, and 27 sensitive species, as well as 17 plant communities identified in the Natural Heritage inventory. These species have traditionally been associated with the forested environment, but some are now recognized on the Grasslands.

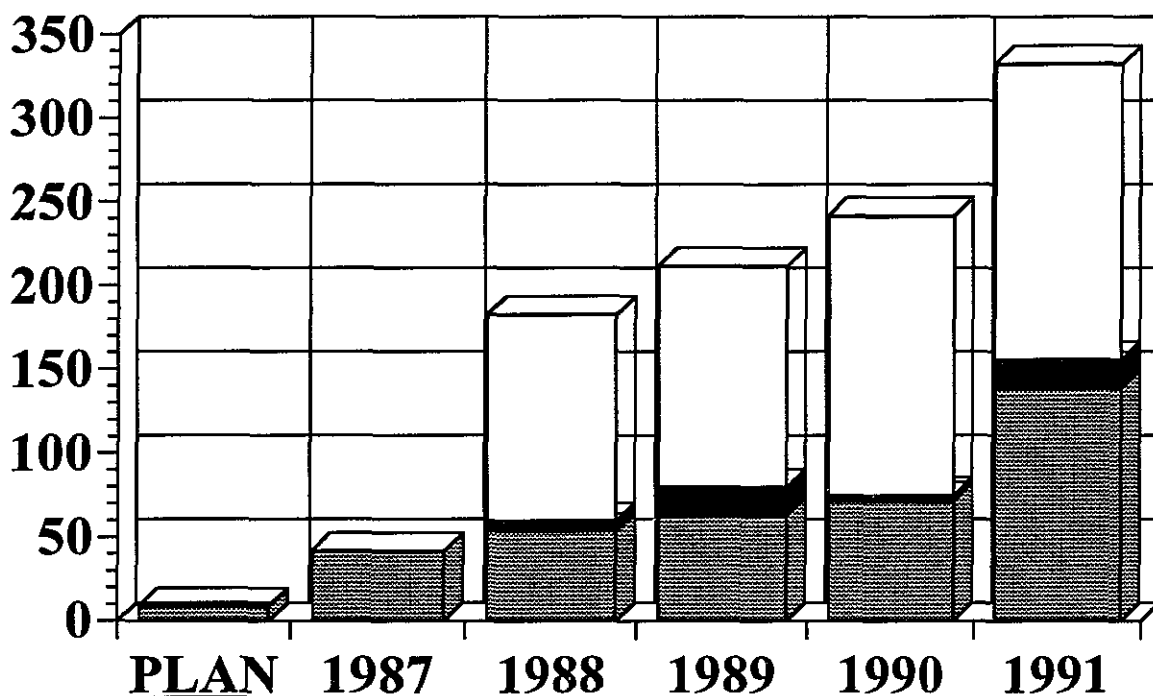
### ACRES OF WILDLIFE IMPROVEMENTS





# NUMBER OF WILDLIFE STRUCTURES

☐ THREATENED AND ENDANGERED SPECIES  
☒ FISHERIES  
☒ WILDLIFE



Total monies appropriated for wildlife and fisheries have exceeded planned levels. However, much of the money was dedicated to management of the red-cockaded woodpecker. Therefore, the actual money available for fisheries and management of other wildlife has been less than planned. Despite the funding shortfall, more wildlife habitat improvements have been achieved than was planned. Structural and non-structural improvements for wildlife exceeded Forest Plan projections. Most were the result of management for the red-cockaded woodpecker and cooperative management with other agencies. Improved coordination with state and federal wildlife agencies has resulted since the 1988 court order.



Areas where change may need to be considered include:

- Consider all sensitive and protected species in the revision process to include existing, extirpated, and exemplary plant communities identified in the Natural Heritage Inventory.
- Consider a wider range of species in the management indicator process.
- Describe in the Forest Plan revision the cooperative activity between other federal and state agencies.
- Develop better monitoring guidance for management indicators, plants, animals, and other sensitive species.
- Develop a habitat capability (HABCAP) model for existing Management Indicators and other species of concern.
- Implement a strategy for fisheries inventory and management on lakes, streams, and ponds.

## WILDLIFE BUDGET ALLOCATION (In 1989 Dollars)

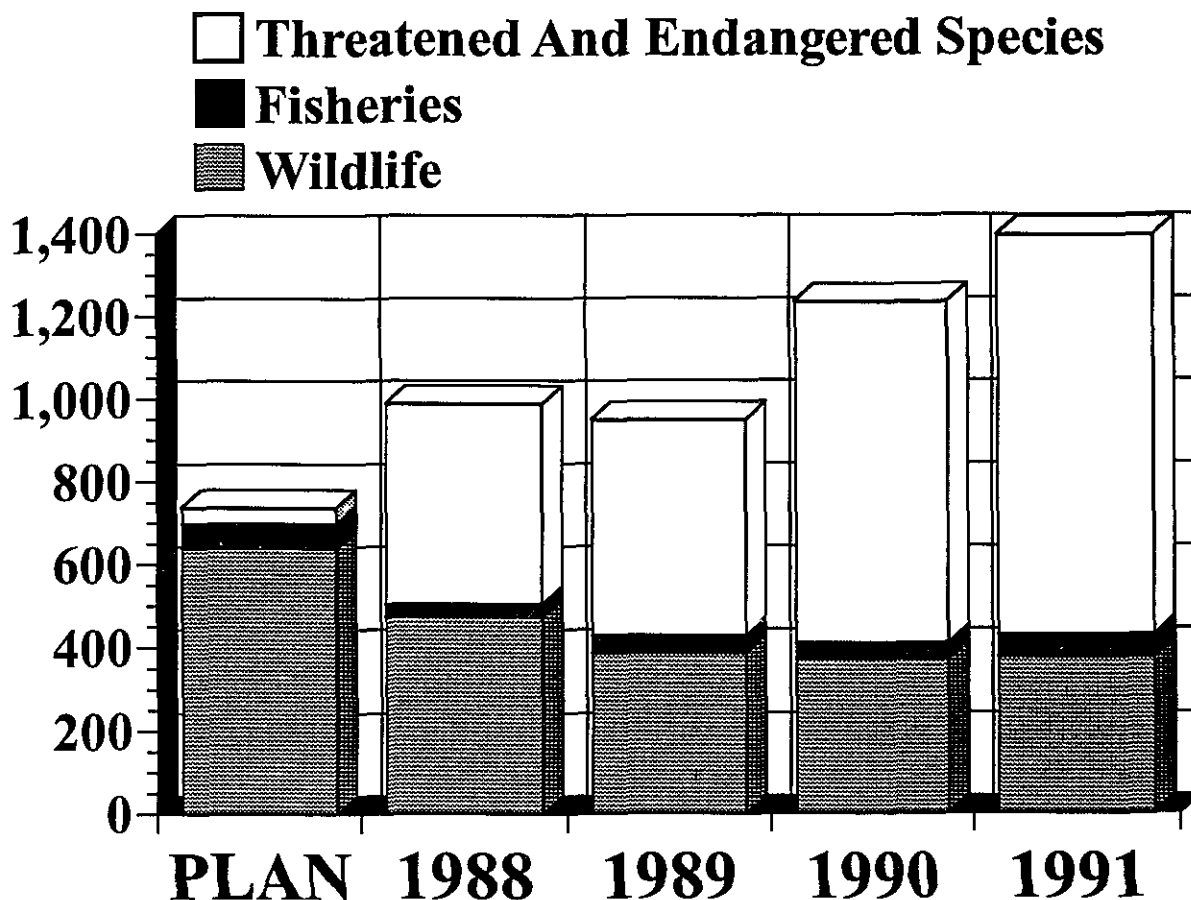






Photo Dale Bounds

Shelter at Boykin Springs



Photo Dale Bounds

Ratcliff Lake Recreation Area - Davy Crockett National Forest



## RECREATION



Photo Dale Bounds

Riding on the Sabine National Forest.

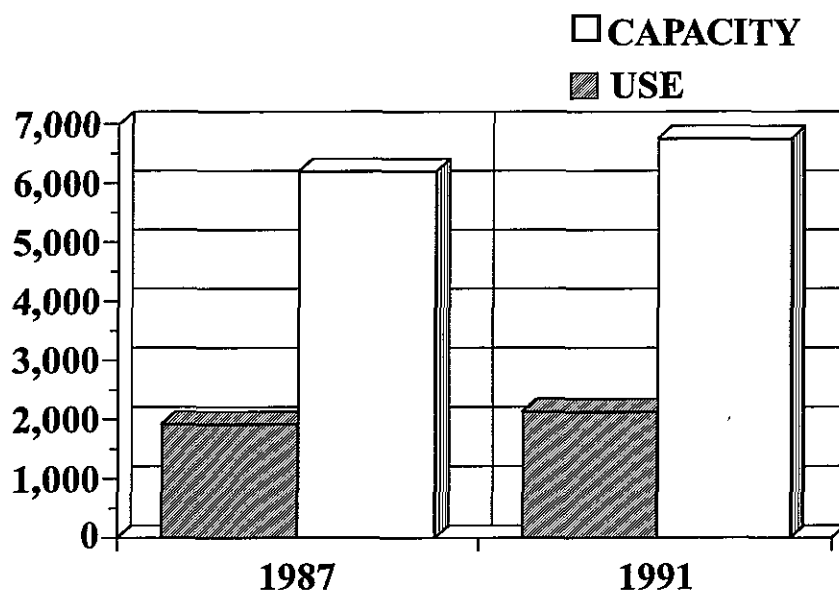
This issue includes management of developed and dispersed recreation, hunting, law enforcement, cultural resources, visual quality and interpretive services. The National Forests and Grasslands in Texas manage almost 35 percent of the federal recreational lands in Texas. Projections for future recreation demand indicate the most popular recreation activities in the area will be walking, developed camping, fishing, and sightseeing. In general, the residents around the Angelina, Davy Crockett, and Sabine National Forests have many recreation opportunities while residents around the Sam Houston National Forest and LBJ National Grasslands have few opportunities for outdoor recreation. While the per capita supply of recreation opportunities is low around the Sam Houston National Forest and the LBJ Grasslands, urban residents account for the majority of outdoor recreation demand.



Although slightly below Forest Plan projections, recreation use increased over levels reported in 1987. Some recreation areas are in poor condition and are only lightly used. Better maintained areas receive heavy use. Campground construction is well behind schedule due to budget shortfalls. Recently, more emphasis has been placed on interpretive programs, signing, and upgrading entrance areas.

## RECREATION USE AND CAPACITY

(1,000 Recreation Visitor Days)



Interpretive services are designed to develop a visitor's interest, enjoyment and understanding of the natural environment as well as an understanding the Forest Service mission. *The Interpretive Systems Plan for the National Forests and Grasslands in Texas* was recently completed. This Plan inventoried major interpretive resources and developed general interpretive themes for the four National Forests. Interpretive activities were only generally addressed in the Forest Plan. Audio tape tours have been developed for the Davy Crockett and Angelina National Forests.

The Recreation Opportunity Spectrum (ROS) classification system identifies areas according to the type of outdoor recreation opportunity provided. Four classes are recognized, based on distance from roads: Semi-Primitive Non-Motorized, Semi-Primitive Motorized, Roaded Natural, and Rural. New roads and trails and disposal of isolated parcels has caused a decline in Forest areas providing a semi-primitive recreation opportunity. Overall recreation use is still well below estimated visitor day capacity of 6,757,034. Estimated recreation visitor days use is 2,135,000.

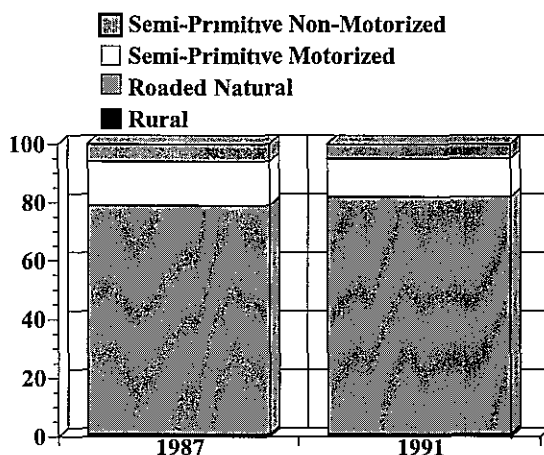


Hunting has been increasing on forest areas. Type II hunting areas account for less than 12 percent of the National Forest area but receive the most intensive management for hunting. Hunting on the National Forest Type II areas increased from 1989 to 1990 while Type II use outside the Forest declined. Confusion in hunting regulations for Type II areas compared to the remainder of the Forest is a major concern. Conflicts between hunting and other uses is another concern.

Visual quality of Forest landscape continues to be an important concern to visitors as pressure increases for timber and services such as recreation. As the roads and trails increase and more people visit the Forest, expectations for high visual quality will have greater impacts on management than when the 1987 Plan was developed. This is reflected in more forest areas inventoried and classified in the more restrictive visual quality objectives.

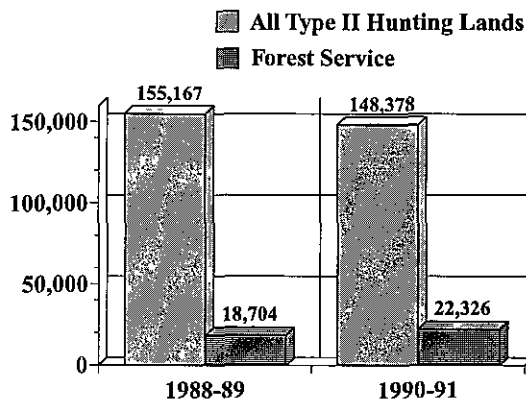
### RECREATION OPPORTUNITY SPECTRUM

(Percent of Total)



### TYPE II HUNTING

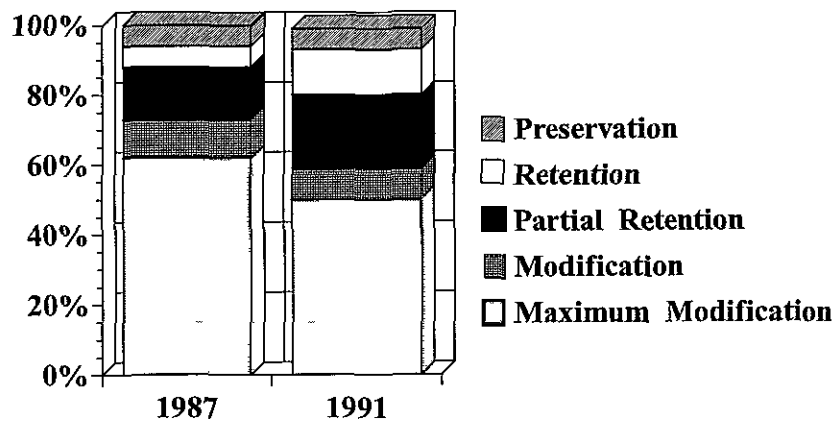
(Number Of Hunter Days)



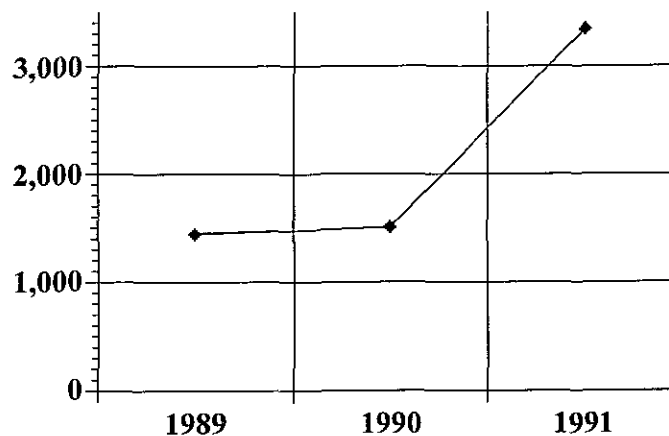


Law enforcement to control poaching, litter control, improper use of off-road vehicles, and illegal or indiscriminate shooting continues as a major concern on the National Forests and Grasslands in Texas. The number of violations and incidents reported has been rising since the Plan was implemented, even though budgets haven't been sufficient to fully implement law enforcement programs at Forest Plan levels. In 1991, more emphasis was placed on law enforcement resulting in more incidents being recorded and violations issued. Therefore, there may not have been an actual increase in the number of incidents.

## VISUAL QUALITY OBJECTIVES (Percentage of Total Acres in Each Class)



## LAW ENFORCEMENT INCIDENTS (Total Number of Incidents)





The primary goal of cultural resource management is to locate, identify, evaluate and protect historic and archaeological sites. Cultural resource inventories have not proceeded at the planned rate, but no adverse effects have occurred, and survey rates have been adequate for compliance. Manpower and budget have not been sufficient to allow general forest-wide surveys as envisioned in the Forest Plan. Requirements for conducting cultural resource surveys, as part of compliance with the National Environmental Policy Act, have been redefined recently. Cultural resource survey levels projected in the Forest Plan are not adequate to fully implement direction under the recent redefinition. In addition, the Forest Plan program level is insufficient to enable quick reaction to emergency situations such as southern pine beetle control needs. Major areas where changes may be needed relative to all recreation considerations include:

- Recreation functional planning should be fully documented in the revision; include developed sites, type of development, and target priority sites.
- Consider potential fee systems to make a more cost effective program and to cover budgetary shortfalls.
- Provide a more defined marketing strategy, to include signing, standardized rules, accessibility, and high visibility conveniences.
- Repair, close, or modify campground problem areas such as those with shoreline erosion.
- Work with Texas Parks and Wildlife Department to simplify and coordinate hunting regulations and seasons to maximize use and reduce user conflicts.
- Monitor hunting and other recreational activities and assess the concerns for overuse, indiscriminate shooting, and other violations.
- Consider a law enforcement system to make better use of existing manpower and budget.
- Develop a prevention program in concert with the Recreation Use Plan and Interpretive Program for better integration of a multi-user program.
- Develop a more strategic cultural inventory program to ensure compliance with National Environmental Policy Act and the state preservation plan.

## **RESOURCE SUSTAINABILITY**

People are concerned about clean air and water, maintaining long-term soil productivity, and maintaining continuous supplies of forage and timber. These concerns are included in this issue. The Texas Air Quality Control Board holds most of the authority over clean air and in wildfire. Research and other air quality monitoring projects have been initiated on the Forests, but results are not available at this time. State monitoring indicates the ozone level over the Sam Houston Forest is a little below standard.



Wildfire incidents have risen since approval of the Forest Plan. An objective stated in the Plan was to reduce the number of person-caused fires; yet an increase of 21 percent occurred during the last four years. The 1991 fire management analysis shows the fire budget in the Plan is about 20 percent below the most efficient level. The Plan contains little direction on fireline construction and rehabilitation.

#### WILDFIRE INCIDENCE

|                              | Total  | Annual Average |
|------------------------------|--------|----------------|
| Lightning Fires              | 77     | 3.9            |
| Person-caused Fires          | 1,494  | 75             |
| Total Fires                  | 1,571  | 79             |
| National Forest Acres Burned | 17,369 | 868            |
| Total Acres Burned           | 23,895 | 1,195          |

Soils are monitored to ensure that long-term productivity is maintained or improved. Most soil and water monitoring has focused on water quality, and it indicates that tested water quality sites comply with all state standards. Ongoing research and monitoring indicate the existing standards and guidelines for grazing and timber harvest are effective in maintaining soil productivity and water quality. Since the Forest Plan was approved, the State adopted a set of Best Management Practices (BMPs) designed to protect water quality. The Forest Plan's standards and guidelines exceed the requirements in the BMPs.

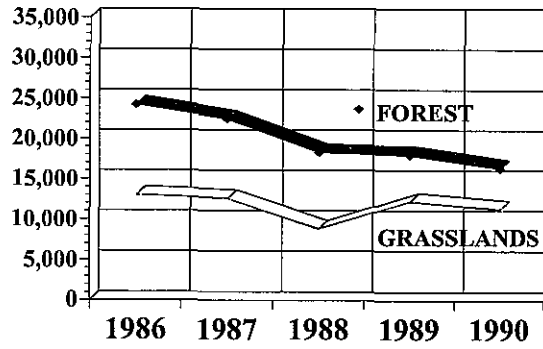
Soil and water inventories have been below levels stated in the Plan, but no adverse impacts have occurred because project implementation has been slower than anticipated. Watershed improvements have been implemented near Plan levels, but much work remains. Shoreline erosion has seriously damaged some recreation facilities on the major reservoirs, especially Sam Rayburn. The Plan contains few soil and water standards for off-road vehicle trails and local erosion and sedimentation has occurred.

Little data assessing range condition and forage utilization rates on the National Grasslands exist. However, recently published soil surveys include data on range productivity. These data, based on long-term research by the Soil Conservation Service, indicate estimates of range productivity used in the Forest Plan for the National Grasslands were too high. However, a preliminary reanalysis indicates grazing use is still below carrying capacity for the Grasslands. Research results indicate the range productivity estimates used for the National Forests were accurate.

Livestock grazing use on the Forests has declined while grazing use on the Grasslands has remained fairly steady. This follows the general trend projected in the Forest Plan, although the decline on the Forest happened much more quickly than anticipated. Current demand projections indicate the demand for grazing on the Grasslands is about as anticipated in the Forest Plan. In general, this projection indicates most available grazing on the National Grasslands will be utilized. On the Forest, the downward trend is expected to slowly start leveling out. Some of this declining demand is probably attributable to a decision in the Forest Plan to de-emphasize the range resource on the National Forests.

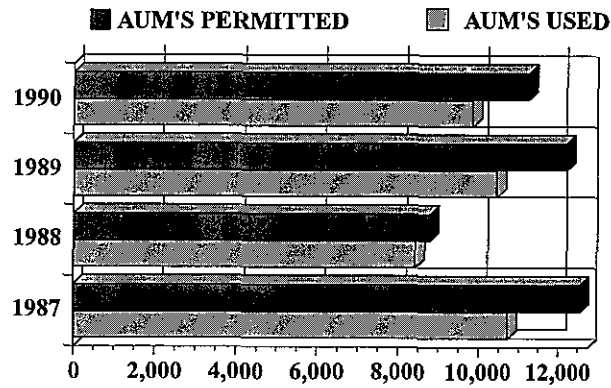


### GRAZING (AUM's Permitted\*)

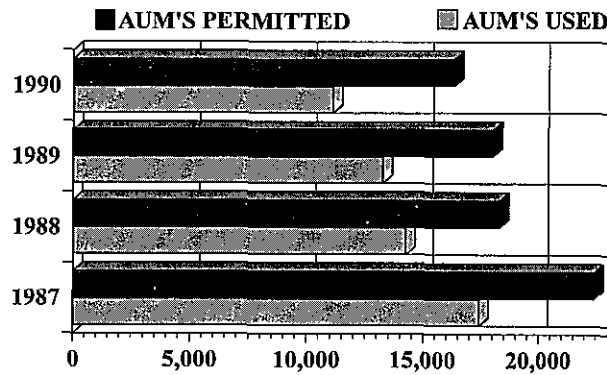


\*Animal Unit Month

### GRAZING USE ON THE GRASSLANDS



### GRAZING USE ON THE FOREST





Research indicates the impacts on water quality from grazing and timber harvest are within prescribed limits when Best Management Practices are employed. Range improvements and range use are well below Plan levels. Current surveys assessing range conditions are lacking on many allotments. The data available suggest range conditions may be unsatisfactory in some areas. Non-native species, such as bermuda grass, have been used widely on the Grasslands. The Plan contains few standards and guidelines directing the level and season of use in different ecosystems.

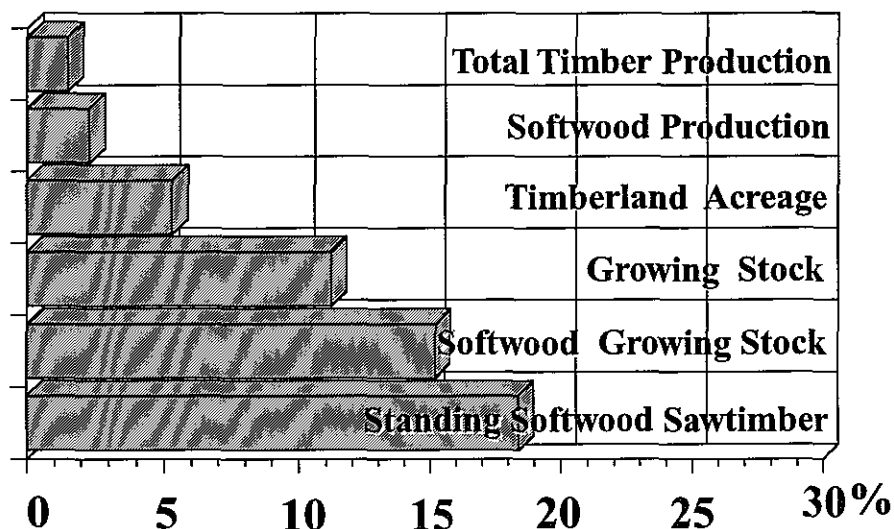
Growth and yield coefficients are used to project yields from National Forest stands. Validation of the coefficients used in the Forest Plan was not possible because few timber management strategies modeled were never implemented. These strategies changed in response to the need to manage differently for red-cockaded woodpeckers, and concerns over clearcutting. A review of current growth and yield models indicates that in some cases, more current models are available today. In other cases, the models used to develop coefficients are still state-of-the-art. The different management strategies being considered or proposed for managing red-cockaded woodpeckers and for managing mixed pine and hardwood stands were not analyzed in the Forest Plan.

Although the National Forests account for about 5 percent of the timberland acreage in East Texas, they provide less than 5 percent of the total timber supply. The Forest contains about 12 percent of total growing stock and 18 percent of the supply of standing sawtimber in East Texas. Much of the Forests' sawtimber supplied is of high quality and is extremely important to some businesses.

The timber supply and demand analysis indicated that the non-industrial private forest lands could supply the market with any timber shortfall from National Forests, if sufficient higher timber prices inducement should occur. However, this sawtimber quality may be somewhat lower than what the Forests are producing.

## NATIONAL FOREST ROLE IN THE MARKET AREA

(National Forest as a Percentage of East Texas Totals)



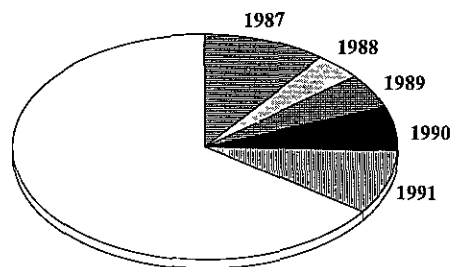


National Forest timber harvest levels have been well below those projected in the 1987 Plan due to changes in management for red-cockaded woodpecker and the impacts of recent southern pine beetle epidemics, appeals and litigation. Timber sale volumes have increased steadily since 1988. The Forest Plan shows only the total timber sale program level planned and does not distinguish between live and dead. A considerable portion of the timber harvest has been obtained through the salvage of dead material. This affects the projected receipts to the U.S. Treasury and to the counties since the stumpage received for dead wood is generally much less than for green wood.

A summary of areas where changes may be needed follows:

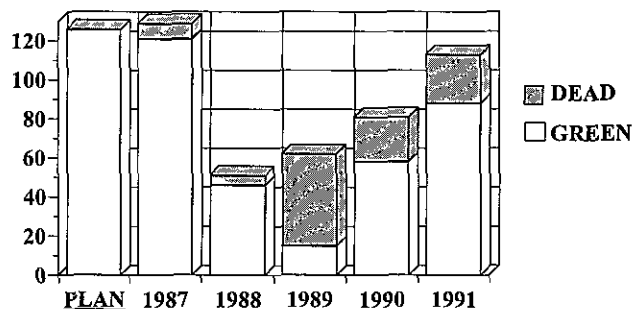
- Add direction for air quality, fireline construction and reconstruction, and off-road vehicle trails.
- Clarify fire management objectives and integrate fire management analysis in the revision.
- Increase objectives for watershed improvement.
- Reanalyze range condition where this information is old or lacking.
- Add direction regarding level of use, season of grazing, use of non-native forage species, and management of native and non-native range.
- Revise grazing projections on the Forest to reflect current and expected demand.
- Incorporate modeling for red-cockaded woodpecker management and mixed management types in the revision.
- Consider alternative(s) in the revision which maximize, to the extent possible, timber harvest levels.
- Reassess the allowable sale quantity and timber sale program levels in the revision.

**TIMBER SOLD**  
(As a Percentage of Planned Allowable Sale Quantity)



*PLANNED ALLOWABLE SALE QUANTITY, FROM  
1987-1997, WAS 1,204 MBF*

**NATIONAL FOREST TIMBER SOLD**  
(In Thousand Board Feet)





## MIX OF GOODS AND SERVICES

Forest Plan implementation methods and the balance of management between the various resources is a concern to many. The Forest Plan is being revised because of management changes for the red-cockaded woodpecker. The Plan has been amended twice for changes in management of red-cockaded woodpeckers, twice to incorporate decisions made in the *Vegetation Management Environmental Impact Statement*, once to clarify policy on four wheel drive vehicles, and once to change a standard and guideline pertaining to rights-of-way. Implementation of the Forest Plan can be confusing because each amendment was formatted differently. Several documents are needed in order to select the appropriate Plan direction. Numerous appeals of project decisions have slowed Forest Plan implementation.

The size of the Forests' work force gradually increased over the last few years and several non-traditional specialist positions have been added. The Forests are actively involved in efforts to diversify in order to mirror the Nation's work force. Enrollment in human resource programs including Senior Community Service Employment and the Youth Conservation Corps Program has exceeded Plan projections.

Nine appeals of the Forest Plan were received and two of these were resolved through minor modifications in the Plan. Many projects designed to implement the Plan have been appealed as is shown in the following tables. The large number of appeals can be misleading, since most of the appeals were generated by members of a few special interest groups. One thing is clear, timber management and southern pine beetle control continue to be major issues.

### NUMBER OF APPEALS

| Fiscal Year <sup>1</sup> | Ranger Dec. | Supervisor Dec. | R. Forester Dec. | Total           |
|--------------------------|-------------|-----------------|------------------|-----------------|
| 1988                     | 73          | ?               | ?                | 73 <sup>2</sup> |
| 1989                     | 88          | ?               | ?                | 88 <sup>2</sup> |
| 1990                     | 4           | 19              | 3                | 26              |
| 1991                     | 9           | 27              | 3                | 39              |

### TYPE OF PROJECT APPEALED

| Fiscal Year <sup>1</sup> | Timber/SPB | Wildlife | Lands/Minerals | Roads | Recreation |
|--------------------------|------------|----------|----------------|-------|------------|
| 1988                     | 72         | 0        | 1              | 0     | 0          |
| 1989                     | 87         | 0        | 0              | 1     | 0          |
| 1990                     | 21         | 0        | 3              | 1     | 1          |
| 1991                     | 27         | 1        | 5              | 0     | 6          |

<sup>1</sup> 1987 is not shown because data is not available

<sup>2</sup> Number of Supervisor decisions and Regional Forester decisions appealed is unknown and not included in the total.



During monitoring and evaluation it became clear that the scope and intent of 1987 Forest Plan decisions are difficult to interpret. In addition, direction is difficult to reference because of the format. Some management areas prescribed in the Forest Plan cover large areas and the specific intent and desired future condition for that management area is not clearly articulated. These concerns were identified as areas where change may be needed and will be addressed in the Forest Plan revision.

The Forest Service's budget and the distribution of that budget among the various resource areas is determined by Congress. Budgets for the National Forests and Grasslands in Texas have been about 70 percent of planned levels. Although some programs have been better funded than others, there is a current trend toward a more balanced program among the various resource programs.

One problem identified during monitoring is that the costs for a geographic information system (GIS), appeals, and litigation were not included in the Forest Plan's budget. These are significant unplanned costs. Consequently, even if a budget matching that shown in the Forest Plan was received, it would be inadequate to produce all the planned goods and services.

#### ACTUAL EXPENDITURES COMPARED TO FOREST PLAN BUDGET (Thousand \$<sup>2</sup>)

| Activity                                | Plan Budget <sup>1</sup> | FY87          | FY88          | FY89          | FY90          | FY91          |
|---|--------------------------|---------------|---------------|---------------|---------------|---------------|
| Timber Management                       | \$4,009                  | \$3,854       | \$4,166       | \$4,646       | \$3,847       | \$3,815       |
| General Administration                  | 2,458                    | 1,954         | 3,126         | 3,033         | 2,435         | 2,310         |
| Facilities                              | 4,284                    | 1,665         | 2,555         | 2,650         | 1,560         | 2,058         |
| Recreation                              | 3,058                    | 698           | 1,039         | 1,284         | 1,003         | 1,298         |
| Fire                                    | 1,165                    | 466           | 497           | 607           | 521           | 731           |
| Wildlife                                | 738                      | 874           | 989           | 949           | 1,234         | 1,395         |
| Lands                                   | 601                      | 409           | 722           | 515           | 411           | 425           |
| Range                                   | 593                      | 206           | 308           | 289           | 221           | 282           |
| Soil, Water & Air                       | 597                      | 227           | 346           | 540           | 395           | 181           |
| Minerals                                | 431                      | 127           | 205           | 207           | 226           | 244           |
| Law Enforcement                         | 373                      | 78            | 87            | 104           | 274           | 142           |
| Wilderness                              | 215                      | 37            | 44            | 70            | 52            | 177           |
| <b>Plan Implementation Expenditures</b> | <b>18,522</b>            | <b>10,595</b> | <b>14,084</b> | <b>14,894</b> | <b>12,179</b> | <b>13,058</b> |
| Other Expenditures <sup>3</sup>         | 3,743                    | 536           | 1,193         | 314           | 699           | 1,190         |
| <b>Total Budgeted</b>                   | <b>22,265</b>            | <b>11,131</b> | <b>15,277</b> | <b>15,208</b> | <b>12,878</b> | <b>14,248</b> |
| Pest Management                         | 0                        | 135           | 86            | 1,182         | 544           | 243           |
| <b>Total Forest Expenditures</b>        | <b>---</b>               | <b>11,266</b> | <b>15,363</b> | <b>16,390</b> | <b>13,422</b> | <b>14,491</b> |

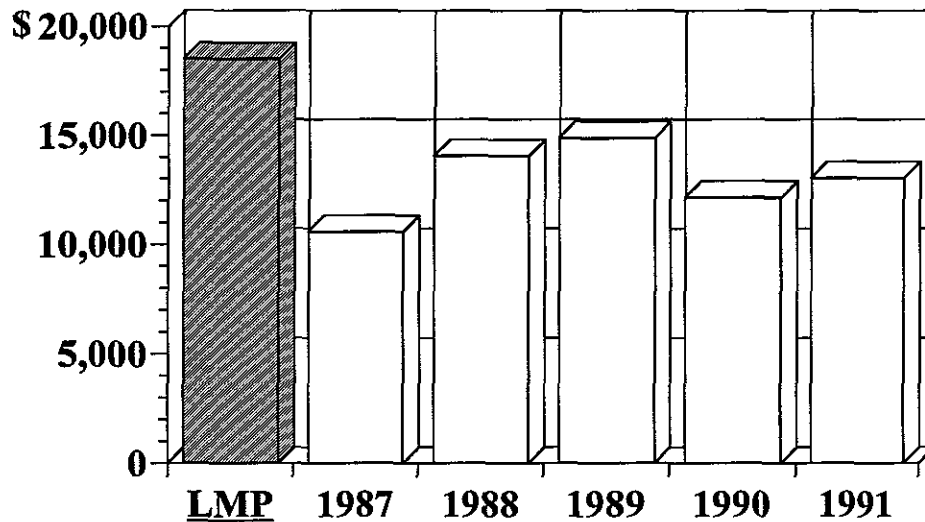
<sup>1</sup> From Appendix H in the Forest Plan

<sup>2</sup> Dollars shown are 1989 dollars.

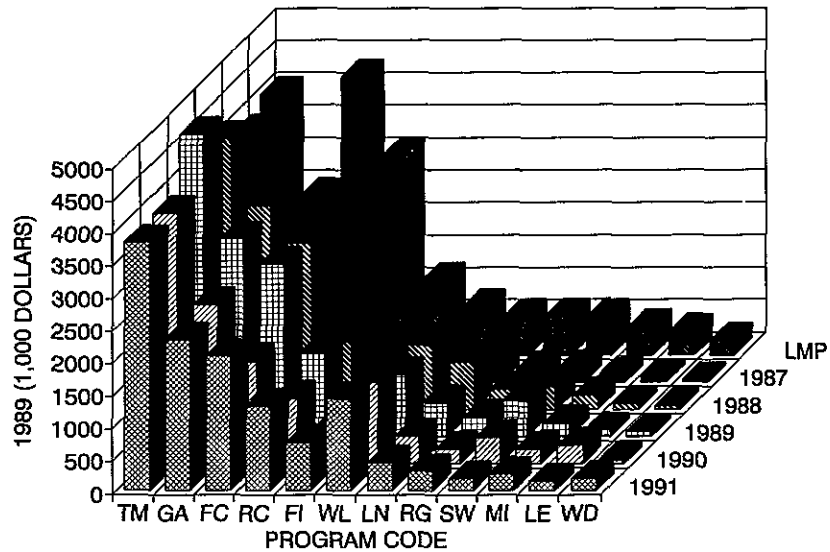
<sup>3</sup> Includes Purchaser Credit, Purchaser Turnback Roads, Land Acquisition, and other monies.



## PLANNED BUDGET VERSUS ACTUAL BUDGET



## EXPENDITURES BY FISCAL YEAR



TM = Timber Management  
 GA = General Administration  
 FC = Facilities  
 RC = Recreation  
 FI = Fire  
 WL = Wildlife

### LEGEND

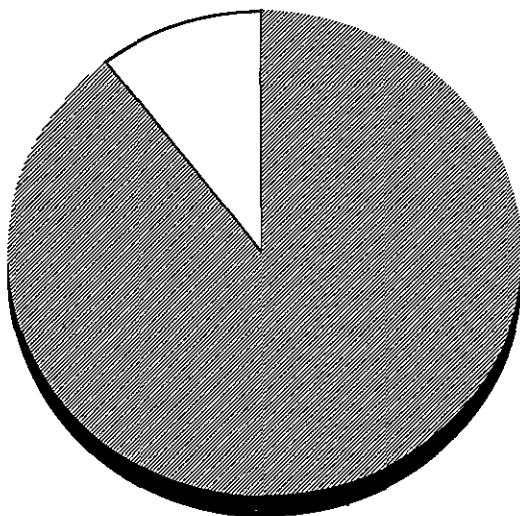
LN = Lands  
 RG = Range  
 SW = Soil, Water and Air  
 MI = Minerals Management  
 LE = Law Enforcement  
 WD = Wilderness Management



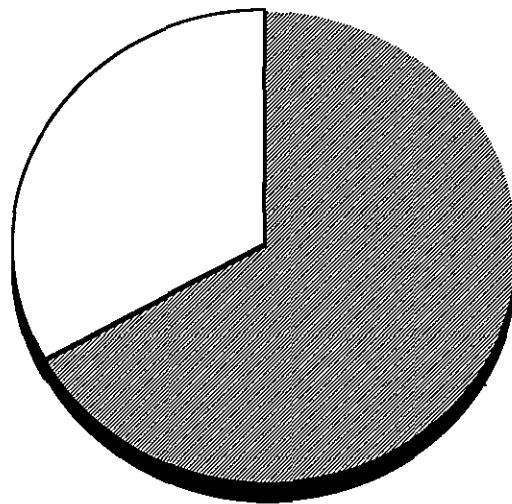
The Forest area managed for timber production is classed as suitable scheduled lands. These "suitable" lands are important in determining the allowable sale quantity. This allowable sale quantity is the timber volume that may be sold from the "suited" or "suitable" forest land covered by the Forest Plan, and it is usually described as a ten year or decade limit. Lands available for timber production have decreased about 2 percent, or 9,781 acres, due to changes in landownership, better inventory, and management constraints for threatened, endangered and sensitive species (including red-cockaded woodpecker). The volume of wood that can be produced on suitable lands has decreased substantially because about one-third of these lands are now managed for red-cockaded woodpecker. In the 1987 Forest Plan about 55,375 acres of suitable timberland were affected by management for red-cockaded woodpeckers. The Plan provided 125 acres of foraging habitat for each of the 443 colonies. The Interim Guidelines for Red-cockaded Woodpecker Habitat Management state that only 8.5 percent of the area may be regenerated per decade and the stand stocking levels are also lower than provided in the 1987 Forest Plan. If these changes are implemented the timber volume capability will be substantially reduced.

## **SUITABLE TIMBERLAND AFFECTED BY MANAGEMENT FOR RED-COCKADED WOODPECKER**

■ General Forest Areas  
□ RCW Foraging Habitat



**1987**



**1990**



Range suitability refers to Forest and Grassland acreage available, suitable and potentially capable of producing forage for grazing animals. The Forest Plan classified 36,507 acres on the National Grasslands and 597,844 acres on the National Forests as suited for forage production. Using 1991 data, 35,532 acres on the National Grasslands and 602,976 acres of the National Forests were found suited. Approximately 4,157 more acres are capable and suited for grazing than in 1987. This translates into an increased capacity of roughly 400 animal unit months, or less than a 0.5 percent increase in suitable grazing lands. Grazing use is currently well below capacity.

Facilities include buildings and structures needed to implement the Forest Plan. The Forest has approximately 240 structures including offices, work centers, lookout towers, recreation areas and dams. Six of the eight Ranger District Offices are leased and are located several miles from their work centers. This occasionally presents communication and coordination problems. The Angelina Work Center is the oldest and is proposed for replacement as soon as funding permits. Two of the three lookout towers will be retained for visitor interest. Major construction and reconstruction of structural facilities on recreation sites will be considered on a case-by-case basis and will depend on future demands and funding levels. Seven Class C-low hazard dams are administered by the Forest Service and inspected annually. The Class A dam on the Sam Rayburn is administered by the U.S. Army Corps of Engineers, which is responsible for inspections.

A summary of areas where change may be needed follows:

- Clearly describe the decisions that are made or not made in the Plan.
- Clearly describe the desired future condition for each management area.
- Reorganize the Forest Plan to clarify management intent and direction.
- Increase the Forest Plan budget to account for increased costs due to planning, new technology such as Geographic Information System, appeals, and litigation.
- Reassess timber suitability and in particular, reconsider the suitability of red-cockaded woodpecker management areas.
- Reassess and clarify rangeland suitability.

## PLANNING

Most comments received during scoping, and therefore most of this issue, center around monitoring and evaluation of activities. The 1987 Forest Plan contains a set of monitoring and evaluation requirements, and the statement that monitoring would be done if budget permitted. However, two annual monitoring and evaluation reports and the Five-Year Review have been completed. The Five-Year Review was incorporated with the *Analysis of the Management Situation* and includes a *detailed Socio-Economic Assessment*.

These monitoring and evaluation reports were based on information collected by Forest Service personnel and from research projects initiated by universities and state and federal agencies. These include studies concerning wildlife, timber management, uneven-aged management, forest pest management, streamside management zones, grazing and water quality. In addition, a cooperative project with The Nature Conservancy was initiated to consolidate available information regarding the management of the ecosystems and sensitive plant species. A summary of areas where changes may be needed follows:

- Review the monitoring and evaluation requirements including monitoring for social and economic impacts of implementation.



- Incorporate the findings of the socio-economic assessment in the revision.
- Incorporate the results of the The Nature Conservancy effort in the revision.
- Propose and/or support research into aquatic systems, biodiversity, and historic vegetation of the Forests.

## MINERALS

The National Forests and Grasslands in Texas have abundant supplies of oil and gas resources, with some areas on the Sabine National Forest having significant new production. Approximately 188,368 acres within the Forests are presently under lease for oil and gas, and approximately 7,069 acres on the National Grasslands are under lease. Other minerals are found under portions of the Forest, but have not been mined. Gravel from the Forest has been removed, but the number of permits has declined from 13 in 1983, to five in 1989.



Photo Dale Bounds

Oil Well on the LBJ National Grassland

Much of the oil and gas resource on the Forest is found in old, partially depleted fields. Horizontal drilling, a new technology which allows better access to minerals, has renewed activity in the Austin Chalk formation which underlies three National Forests. Areas highly favorable for oil and gas resource occurrences are found on the Davy Crockett, Sabine, and Sam Houston National Forests and on the LBJ National Grassland.



All lands managed by the Forest Service were once privately owned. When National Forest lands were purchased the mineral rights were either: (1) acquired by the Federal Government; (2) remained with the previous owner permanently or for a set period; or (3) owned by a third party and were not part of the transaction. On the four National Forests, 416,739 acres are federally owned minerals. The National Grasslands have 31,907 acres of mineral rights. Over the last six years almost 240,000 acres of mineral rights have reverted to the United States. The government has no absolute control over the exercise of privately owned mineral rights under the federally owned surface.

The number of mineral leases and permits has been lower than projected and minerals administration funding has also been below projected 1987 Forest Plan levels. The Federal Onshore Oil and Gas Leasing Reform Act, which gave the Forest Service final control over leasing oil and gas under the National Forest System lands, resulted in the Forest Service drafting regulations for increased responsibility. Responding to the new requirements caused a temporary decline in new lease issuances in 1988 and 1989. Other leasing complications were created by contradictory United States District Court rulings regarding the sufficiency of Forest Service leasing analyses

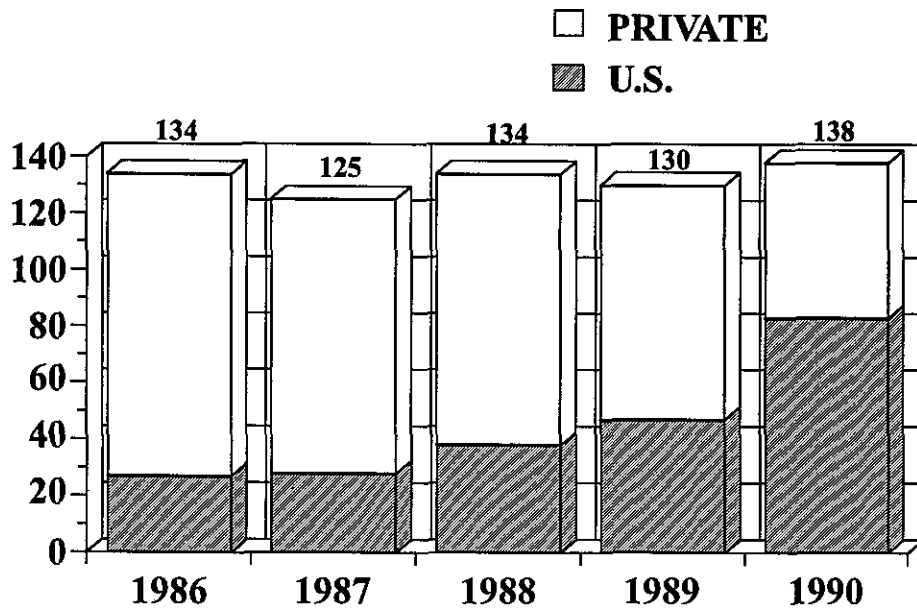
The total number of wells has varied little over the last six years. As old wells creating environmental hazards were plugged and abandoned, new successful wells were completed. Although the number of producing wells has remained fairly constant at about 135 since 1984, the number of federally owned producing wells has increased while the number of private wells has decreased due to the reversion of mineral rights to government ownership.

Exploration and development has been a function of economic and political circumstances because mineral resources provide an important source of revenue for the Federal Treasury and local governments. As can be seen in the following figure, the receipts generated through minerals has increased in the last few years essentially because of horizontal drilling being employed. Income from minerals on the Grasslands has been fairly stable. Some areas where changes may be needed are:

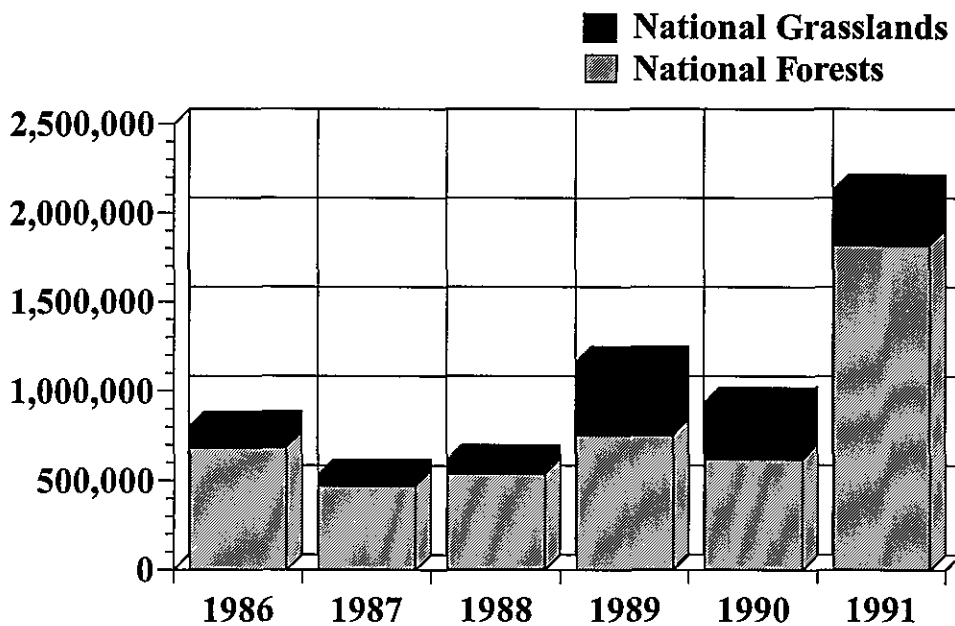
- Adjust budgets and output projections to reflect current trends and projected demand.
- Better describe the minerals resource, minerals exploration and development, the impacts of minerals activities, and supply and demand projections in the revised Forest Plan.
- Revise the management direction to ensure all protected species, not just red-cockaded woodpeckers, are protected during minerals operations.
- Develop new guidelines for reclamation activities.
- Modify existing standards and guidelines for minerals exploration and development in wilderness areas to meet legal rights of private landowners.



## PRIVATE AND U.S. PRODUCING WELLS



## MINERAL REVENUES





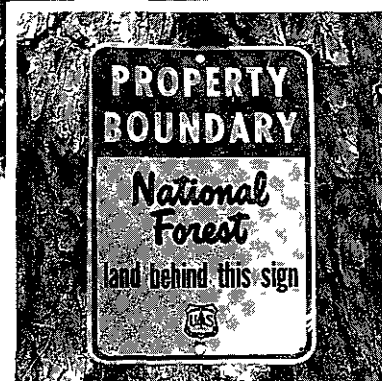
## LANDS

There are about 673,900 acres on the National Forests and Grasslands in Texas. Adequate funding was not sufficient for planned land acquisitions. Land exchanges also fell short of Plan objectives. Property line locations and maintenance are proceeding at near planned rates, while rights-of-way acquisitions are slightly behind plan objectives. The lack of funding to accomplish planned objectives has not created difficulties in other project implementation.



Photo Dale Bounds

Surveying land lines on the Davy Crockett National Forest



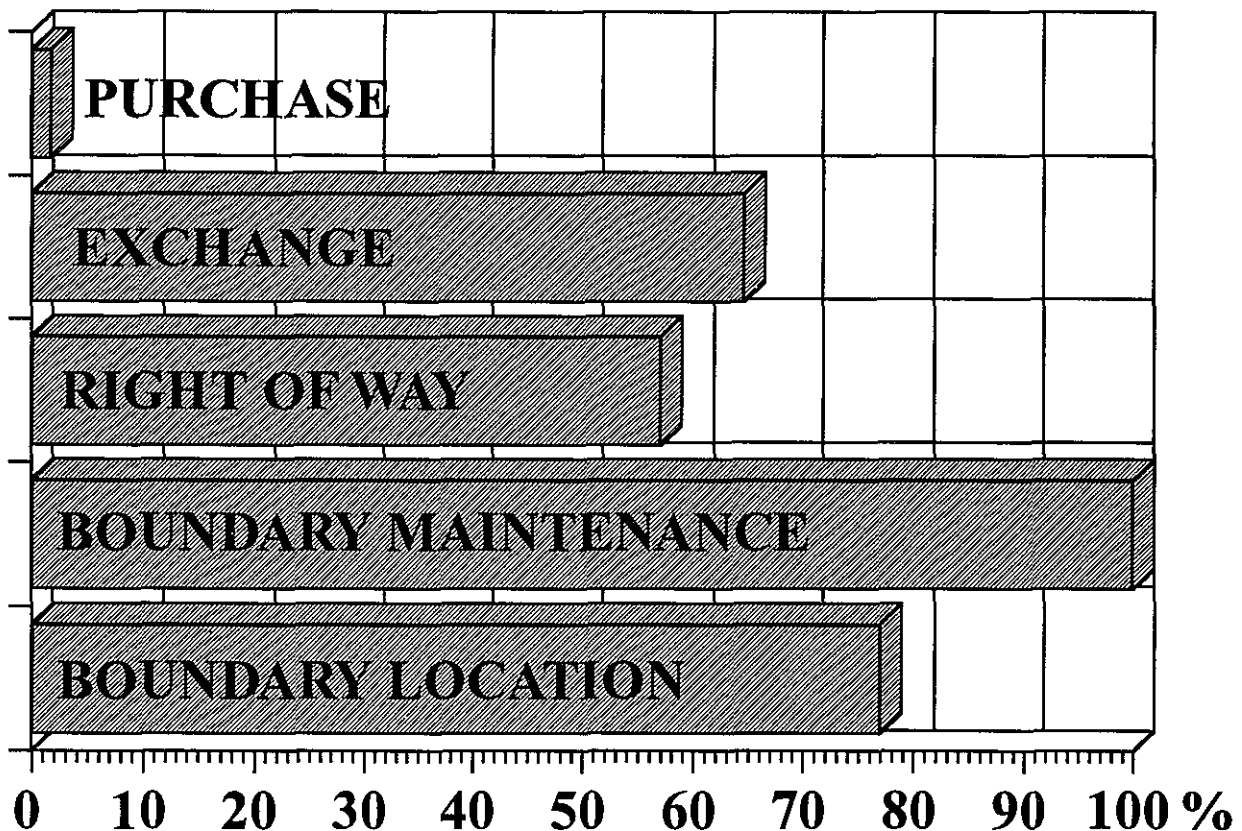
Monitoring identified several minor concerns pertaining to lands. Current authority for landownership adjustment on the National Grasslands is limited because there is currently no purchase authority. The pending legislation, if enacted, regarding the Big Thicket expansion will have a large impact on Forest landownership. In addition, efforts by parties exploring opportunities to link isolated red-cockaded woodpecker colonies south of the Sam Houston National Forest with those on the Forest could have an impact on additional acreage.

Monitoring also identified several recreation concerns that affect land management. Property boundaries are adequate for administrative purposes but are difficult for the public to identify. Objectives for rights-of-way, stated in the Forest Plan, include road but not trail needs. Also, the Plan does not allow appropriate recreational activities such as outfitter and guide services in wilderness areas. Areas where change may be needed are summarized below:



- Reconsider direction prohibiting outfitter and guide services in wilderness areas.
- Consider additional property boundary identification for better visibility by the public.
- Update rights-of-way objectives and consider any needs for trails when doing so.
- Obtain authority to purchase lands on the Caddo and LBJ National Grasslands.
- Review and update the landownership adjustment plans for the Forest.

## LANDS ACCOMPLISHMENTS (As A Percentage of Plan Objectives)





# APPENDIX A - ACTUAL ACCOMPLISHMENTS COMPARED WITH FOREST PLAN OBJECTIVES

| Management Activity                   | Units      | LMP Objective      | FY87    | FY88   | FY89               | FY90               | FY91               |
|---------------------------------------|------------|--------------------|---------|--------|--------------------|--------------------|--------------------|
| <b>Recreation</b>                     |            |                    |         |        |                    |                    |                    |
| Dispersed Recreation Use              | M RVD's    | 2,158              | —       | —      | 2,057 <sup>1</sup> | 2,135 <sup>1</sup> | 2,238 <sup>1</sup> |
| Visual Resource Management            | Acres      | 35,000             | —       | 13,700 | 11,500             | 20,766             | 22,500             |
| Wilderness Area Administration        | Acres      | 35,178             | 36,422  | 37,162 | 37,162             | 37,162             | 37,162             |
| Trail Construction                    | Miles      | 10-25              | 10      | 52     | 11                 | 0                  | 12.1               |
| Trail Maintenance                     | Miles      | 240                | 209     | 161    | 167.8              | 278.5              | 264                |
| Archeological Survey                  | Acres      | 23,184             | 8,400   | 12,800 | 13,968             | 5,634              | 5,358              |
| <b>Wildlife and Fisheries</b>         |            |                    |         |        |                    |                    |                    |
| Wildlife Improvements                 | Acres      | 4,254              | 31,087  | 29,583 | 22,802             | 11,944             | 19,971             |
| Fish Improvements                     | Acres      | 1,385              | 80      | 1,202  | 28                 | 236                | 202                |
| T&E Improvements                      | Acres      | 911                | 425     | 2,398  | 6,527              | 5,717              | 7,923              |
| Wildlife Improvements                 | Structures | 3-15               | 42      | 54     | 63                 | 72                 | 139                |
| Fish Improvements                     | Structures | —                  | 0       | 6      | 17                 | 3                  | 17                 |
| T&E Improvements                      | Structures | —                  | 0       | 123    | 132                | 167                | 177                |
| <b>Timber Management</b>              |            |                    |         |        |                    |                    |                    |
| Timber Sold (Green)                   | MMBF       | 128.3 <sup>1</sup> | 121.2   | 46.5   | 15.9               | 58.4               | 88.2               |
| Timber Sold (Dead)                    | MMBF       | —                  | 8.1     | 4.7    | 47.4               | 22.9               | 25.1               |
| Reforestation                         | Acres      | 6,384              | 6,670   | 8,248  | 8,082              | 6,857              | 7,080              |
| Timber Stand Improvement              | Acres      | 2,747              | 3,972   | 2,927  | 1,581              | 1,415              | 1,200              |
| Area Clearcut                         | Acres      | 3,837              | —       | —      | 877                | 1,500              | 435                |
| Area Shelterwood/Seedtree             | Acres      | 2,747              | —       | —      | 634                | 2,130              | 3,755              |
| Area Uneven-Age Management            | Acres      | 0                  | 0       | 0      | 0                  | 0                  | 813                |
| Area Commercial Thinning              | Acres      | 13,190             | —       | —      | 19,255             | 33,197             | 18,174             |
| Silvicultural Exams                   | Acres      | 52,102             | 123,837 | 4,288  | 59,923             | 70,470             | 68,373             |
| <b>Facilities</b>                     |            |                    |         |        |                    |                    |                    |
| Collector Rds Const/Reconst           | Miles      | 3.6 <sup>2</sup>   | 8.0     | 10.0   | 0                  | 0                  | 0                  |
| Local Roads Const/Reconst             | Miles      | 5.3                | 3.7     | 1.7    | 10.0               | 0.1                | 0.3                |
| Tim Purch Rds Const/Reconst           | Miles      | 79.1               | 63.4    | 24.3   | 27.6               | 56.6               | 77.0               |
| Trails Open                           | Miles      | 225-285            | 209     | 219    | 271                | 282                | 288                |
| <b>Range</b>                          |            |                    |         |        |                    |                    |                    |
| Permitted Grazing                     | AUM's      | 104,300            | 46,172  | 38,587 | 38,133             | 34,723             | 27,564             |
| Structural Improvements               | Structures | 49                 | 9       | 11     | 8                  | 8.3                | 18                 |
| Non-Structural Improvements           | Acres      | 51,136             | 19,098  | 8,711  | 12,764             | 4,059              | 6,296              |
| <b>Soil and Water</b>                 |            |                    |         |        |                    |                    |                    |
| Soil Inventory Survey                 | Acres      | 35,000             | 31,400  | 23,941 | 35,000             | 27,000             | 41,883             |
| Soil & Water Improvement <sup>3</sup> | Acres      | 78                 | 77      | 13     | 68                 | 68                 | 118                |
| Water Resource Inventory              | Acres      | 22,000             | 7,400   | 10,980 | 9,791              | 4,324              | 25,356             |
| <b>Land</b>                           |            |                    |         |        |                    |                    |                    |
| Land Exchanges                        | Acres      | 1,800              | 1,951   | 1,328  | 0                  | 830                | 1,067              |
| Land Purchases                        | Acres      | 816                | 0       | 0      | 32.2               | 0                  | 44.5               |
| Rights-of-Way Acquisition             | Cases      | 7                  | 8       | 2      | 1                  | 4                  | 5                  |
| Property Lines Maintained             | Miles      | 302                | 443     | 257    | 306                | 314.17             | 304.6              |
| Property Lines Located                | Miles      | 43                 | 48      | 33     | 27.9               | 30                 | 28.7               |
| <b>Minerals</b>                       |            |                    |         |        |                    |                    |                    |
| Oil and Gas Leases                    | Plans      | 475-530            | 437     | 442    | 420                | 344                | 409                |
| <b>Fire Management</b>                |            |                    |         |        |                    |                    |                    |
| Fuel Reduction                        | Acres      | 20,800             | 10,005  | 22,692 | 16,630             | 18,859             | 22,451             |
| <b>Law Enforcement</b>                |            |                    |         |        |                    |                    |                    |
| Funding (in 1989 dollars)             | M \$       | 373                | 78      | 87     | 104                | 274                | 144                |

<sup>1</sup> In the remand of the Forest Plan, the Chief set the maximum timber sale program level at 119 MBF/year

<sup>2</sup> Objective includes arterial roads

<sup>3</sup> Includes only work funded with appropriated (P & M), KV, and excess timber receipts (ETR) monies. PL534 attainment is not included

<sup>4</sup> Total recreation use. Reporting no longer separates developed from dispersed use



## APPENDIX B - CUMULATIVE ACCOMPLISHMENT OF FOREST PLAN OBJECTIVES, FY87-91

| Activity   | Units      | Backlog <sup>1</sup> |
|--|------------|----------------------|
| <b>Timber Management</b>                         |            |                      |
| Timber Sold (Green)                              | MMBF       | -272.1               |
| Reforestation                                    | Acres      | +4,977               |
| Timber Stand Improvement                         | Acres      | -2,740               |
| Area Clearcut                                    | Acres      | -8,099               |
| Area Cut with Seedtree or Shelterwood            | Acres      | -1,722               |
| Area Under Uneven-Age Management                 | Acres      | +813                 |
| Area Commercially Thinned                        | Acres      | +31,056              |
| Silvicultural Exams Prescriptions                | Acres      | -5,354 <sup>5</sup>  |
| <b>Recreation</b>                                |            |                      |
| Dispersed Recreation Use                         | M RVD's    | +82 <sup>4</sup>     |
| Visual Resource Management                       | Acres      | -71,534 <sup>2</sup> |
| Wilderness Area Administration                   | Acres      | +1,986 <sup>4</sup>  |
| Trail Construction                               | Miles      | +10                  |
| Trail Maintenance                                | Miles      | +24 <sup>4</sup>     |
| Archeological Survey                             | Acres      | -68,730 <sup>2</sup> |
| <b>Facilities</b>                                |            |                      |
| Collector Roads Constructed/Reconstructed        | Miles      | -2.0                 |
| Local Roads Constructed/Reconstructed            | Miles      | -11.0                |
| Timber Purchaser Roads Constructed/Reconstructed | Miles      | -146.6 <sup>2</sup>  |
| Trails System                                    | Miles      | +23.0                |
| <b>Range, Wildlife and Fisheries</b>             |            |                      |
| Non-Structural Wildlife Improvements             | Acres      | +93,927              |
| Non-Structural Fish Improvements                 | Acres      | -5,177               |
| Non-Structural T&E Improvements                  | Acres      | +18,933              |
| Wildlife Structural Improvements                 | Structures | +949                 |
| Permitted Grazing                                | M AUM's    | -76,736 <sup>3</sup> |
| Structural Improvements                          | Structures | -191                 |
| Range Non-Structural Improvements                | Acres      | -204,752             |
| <b>Soil and Water</b>                            |            |                      |
| Soil Inventory Survey                            | Acres      | -15,976              |
| Soil & Water Improvement                         | Acres      | -46                  |
| Water Resource Inventory                         | Acres      | -52,149              |
| <b>Lands Management</b>                          |            |                      |
| Land Exchange                                    | Acres      | -2,824               |
| Land Purchases                                   | Acres      | -4,003               |
| Rights-of-Way Acquisition                        | Cases      | -15                  |
| Property Lines Maintained                        | Miles      | +65                  |
| Property Lines Located                           | Miles      | -49                  |
| <b>Minerals Management</b>                       |            |                      |
| Oil and Gas Leases                               | Plans      | -643 <sup>3</sup>    |
| <b>Fire Management</b>                           |            |                      |
| Prescribed Fire Fuel Reduction                   | Acres      | -13,363              |

<sup>1</sup> + indicates actual accomplishment exceeds objective listed in the Forest Plan.

<sup>2</sup> Not really a backlog. Accomplishment of this objective is a direct function of the level of the timber sale program

<sup>3</sup> Demand has been fully met. The backlog indicates demand was overestimated in the Forest Plan.

<sup>4</sup> Not a cumulative figure Represents status as of FY91.

<sup>5</sup> Cumulative for FY88-91 only. Prescriptions completed prior to FY88 had to be rewritten and thus are not included.



**APPENDIX C - PAYMENTS TO COUNTIES (Thousand \$)**

| <b>County</b>         | <b>FY87</b> | <b>FY88</b> | <b>FY89</b> | <b>FY90</b>    | <b>FY91</b>    |
|-----------------------|-------------|-------------|-------------|----------------|----------------|
| Angelina              | 378         | 169         | 81          | 101            | 101            |
| San Augustine         | 448         | 205         | 106         | 132            | 137            |
| Jasper                | 133         | 61          | 29          | 36             | 36             |
| Shelby                | 264         | 281         | 229         | 292            | 357            |
| Sabine                | 419         | 445         | 364         | 462            | 567            |
| Montgomery            | 101         | 58          | 89          | 90             | 139            |
| Walker                | 115         | 66          | 101         | 102            | 158            |
| San Jacinto           | 127         | 73          | 112         | 112            | 174            |
| Trinity               | 708         | 564         | 369         | 418            | 290            |
| Houston               | 989         | 787         | 515         | 582            | 405            |
| Nacogdoches           | 63          | 28          | 13          | 16             | 16             |
| Newton                | 8           | 8           | 7           | 9              | 11             |
| Wise <sup>2</sup>     | 28          | 22          | 23          | — <sup>1</sup> | — <sup>1</sup> |
| Montague <sup>2</sup> | <1          | <1          | <1          | — <sup>1</sup> | — <sup>1</sup> |
| Fannin <sup>2</sup>   | 0           | 0           | 0           | — <sup>1</sup> | — <sup>1</sup> |

<sup>1</sup> Unavailable at present time.

<sup>2</sup> National Grasslands receipts are reported on a calander year basis rather than a fiscal year basis. Thus, the numbers shown are for the calander year and not fiscal year.