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**Forest Service**

Mark Twain  
National Forest

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**Fiscal Year 2007**

# **Monitoring & Evaluation Report**



Mark Twain  
National Forest

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# APPROVAL AND DECLARATION OF INTENT

I have reviewed the FY2007 Monitoring and Evaluation Report for the Mark Twain National Forest that was prepared by an interdisciplinary team during the fall of 2007. The Monitoring and Evaluation Report meets the intent of both the Forest Plan (Chapter IV) as well as the regulations contained in 36 CFR 219.

This report is approved:

*/s/ Paul J.V. Strong*

April 1, 2008

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Paul Strong  
Acting Forest Supervisor

Date



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# Summary of Findings and Recommendations

## Findings

- After two years implementing the new 2005 Forest Plan, scheduling of new projects in MP 1.1 and 1.2 does not seem to be keeping pace with the new plan objectives for ecosystem restoration. (page 10.)
- Tracking of accomplishments in Management Prescription 1.1 and 1.2 is difficult, partly due to incomplete or inaccurate information in the corporate databases (page 10.)
- Despite continued efforts by the Forest Service and others, Missouri's feral hog population continues to grow in size and expand in range (page 10.)
- It appears that the Eleven Point River population of Ozark hellbenders may be on the brink of extirpation (page 16.)
- There is a need to switch from spring to growing season burning at Kaintuck fen (page 17.)
- Although the Forest treated 150% of the acres needed to meet Forest Plan objective 1.4a for improving open woodland habitat, it is doubtful that any of these acres have reached the desired future condition (page 18.)
- 7,000 acres need to be converted from cool season grasses to native grasses to meet Forest Plan Objective 1.4b (page 18.)
- Although the Forest has treated more acres of glades than needed to meet Forest Plan Objective 1.4d, additional treatments may be needed to reach optimum Bachman's sparrow habitat (page 19.)
- At the current rate of designation, it will take at least 11 years for the Forest to meet Forest Plan Objective 1.4e for designation of old growth (page 19.)
- The ratio of sawtimber to roundwood sold remains seriously out of balance with the projections made by the Forest Plan analysis (page 19.)
- Information regarding the amount of cedar reduction, non-commercial thinning, skid trails and temporary roads was not readily available (page 20.)
- There is a need for better coordination among engineers, ID teams, and timber staff in identifying both short and long-term access needs and road maintenance levels during project development and analysis (page 32.)
- Roads decommissioned congruent with timber sale activities aren't reliably recorded in any tabular database (page 32.)

## Recommendations

- Continue working towards developing burn parameters and guidelines for use in implementing growing season burns.
- Develop better methods for reporting and tracking restoration activities, cedar reduction, non-commercial thinning, skid trails and temporary roads.

- Develop a better method for tracking and reporting road decommissioning accomplishments and effectiveness.
- Develop methods for identifying and tracking the costs associated with management activities.
- Ensure that all activities are reported in the corporate databases, and that all data fields are populated.

# Fiscal Year 2007 Annual Monitoring & Evaluation Report

## Introduction

Effective Forest Plan monitoring and evaluation fosters improved management and more informed planning decisions. It helps identify the need to adjust desired conditions, goals, objectives, standards and guidelines as conditions change. Monitoring and evaluation helps the Agency and the public determine how a Forest Plan is being implemented, whether plan implementation is achieving desired outcomes, and whether assumptions made in the planning process are valid.

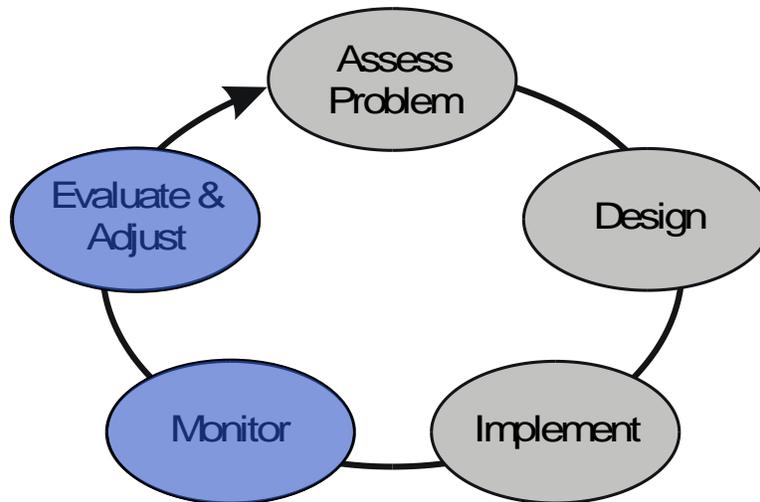
Monitoring and evaluation are learning tools that form the backbone of adaptive management. With these tools, information is collected and compiled to serve as reference points for the future; new scientific understanding and technology, changes in law, policy and resource conditions, growing concerns, trends and changing societal values are incorporated into forest planning; and the scientific validity and appropriateness of assumptions used in the development of the forest plan is evaluated. In short, they breathe life into a static document—the Forest Plan—to make it dynamic, relevant, and useful.

Several kinds of activities can be referred to as “monitoring.” Programmatic monitoring tracks and evaluates trends of ecological, social, or economic outcomes. Project implementation monitoring monitors compliance with Forest Plan standards and guidelines. Effectiveness monitoring evaluates how effective our management actions are at achieving desired outcomes. Validation monitoring verifies assumptions and models used in Forest Plan implementation. Monitoring may also address issues for large geographic areas of which the forest is a part.

## Monitoring and Evaluation Requirements

Minimum monitoring and evaluation requirements have been established through the National Forest Management Act (NFMA) at 36 CFR 219 (1982). Some requirements provide guidance for the development of a monitoring program, while others include specific compliance requirements. The minimum legally required monitoring tasks were identified in Table 4-1 of the Forest Plan and will be noted in this Report.

Monitoring and evaluation are separate, sequential activities required by NFMA regulations. Monitoring involves collecting data by observation or measurement. Evaluation involves analyzing and interpreting monitoring data. The information gained from monitoring and evaluation is used to determine how well the desired conditions, goals, objectives, and outcomes of the Forest Plan have been met. Monitoring and evaluation keeps the Forest Plan up-to-date and responsive to changing conditions and issues. This process provides the feedback mechanism for adaptive management (see figure below). The results are used to identify when changes are needed to either the Forest Plan itself or the way it is implemented.



### Previous Monitoring Efforts

Under the 1986 Forest Plan, monitoring activities were conducted and Annual Monitoring and Evaluation Reports (Annual M&E Reports) were compiled. These reports were used to inform the Analysis of the Management Situation (AMS), which was developed in preparation for the Forest Plan revision. The AMS described the current condition of the Forest and evaluated inventory and monitoring information to identify necessary changes in management direction. The AMS, in essence, closed the book on monitoring under the 1986 Forest Plan.

This is the second Annual M&E Report compiled under the 2005 Mark Twain National Forest Plan. Regional Forester, Randy Moore, signed the plan on September 21, 2005, and implementation of the Plan began on January 3, 2006. The Monitoring Program is described in Chapter IV of the Forest Plan.

### Monitoring Program

#### Forest Plan

Chapter 4 (Monitoring and Evaluation) of the Forest Plan is strategic in nature and provides programmatic direction for monitoring and evaluating Forest Plan implementation. The Forest Plan addresses several types of monitoring. These requirements fall into four broad categories:

- Category 1: Required monitoring items (NFMA, and 1982 36 CFR 219 regulations, as permitted by 36 CFR 219.14(e) and (f) of the 2005 Planning rule.)
- Category 2: Attainment of goals and objectives
- Category 3: Implementation of standards and guidelines and
- Category 4: Effects of prescriptions, management practices, and off-road vehicles

Required Category 1 monitoring items are mandatory components of every forest plan, whereas Category (2) through (4) monitoring items are more flexible and tailored to address issues raised through public scoping and interdisciplinary team review. A more complete description of Category 1 through 4 monitoring items can be found in Chapter 4 of the 2005 Forest Plan.

## Monitoring and Evaluation Implementation Guide (Monitoring Guide)

The Monitoring and Evaluation Implementation Guide (Monitoring Guide) is part of the overall monitoring framework for the Mark Twain National Forest. While Chapter 4 (Monitoring and Evaluation) of the Forest Plan is strategic in nature and provides programmatic direction for monitoring and evaluating Forest Plan implementation, the Monitoring Guide provides direction that is more specific to implement the monitoring strategy outlined in the Forest Plan. The Monitoring Guide details the methodologies and protocols used to conduct monitoring and evaluation tasks identified in the 2005 Forest Plan for the Mark Twain National Forest. The Monitoring Guide also assigns responsibilities for monitoring and evaluation tasks, and defines where monitoring data is to be stored.

The Guide is flexible and may be changed as new methodologies and techniques are developed. It allows the principles of adaptive management to be applied so that as monitoring techniques are implemented they can be evaluated for their effectiveness and efficiency (and revised as appropriate). Such changes and updates are administrative corrections and do not require a plan amendment or revision. (§ 219.6(b))

The Forest Plan ID Team developed this Monitoring Guide to facilitate data collection and storage of monitoring items using standardized monitoring protocols and corporate data/information storage.

During FY 2007, the team continued to work with scientists from the Northern Research Station and the Northern Monitoring Program to develop methods for answering some of the monitoring questions at the Forest-wide scale. These methods include using FIA data to determine whether the Forest as a whole is moving towards the desired condition as described in the Forest Plan, identifying changes in habitat for MIS and TES species, and other large scale issues. The Forest's coordination with the Northern Research Station and the Northern Monitoring Program is on going. These monitoring results will be of most value in looking at long-term changes, such as will be done in the Comprehensive Evaluation Report.

## Annual Monitoring Activities

The Annual Monitoring Schedule identifies which items will be measured, and how the monitoring questions will be answered. It identifies and schedules various site-specific, on-the-ground monitoring activities, and describes the purpose, methods, locations, responsible persons, and estimated costs.

Budgetary constraints may affect the level of monitoring that can be done in a particular fiscal year. If budget levels limit the Forest's ability to perform all monitoring tasks, then those items specifically required by law are given the highest priority.

Each Ranger District will conduct three monitoring field trips per year. In addition, the SO will lead three monitoring field trips per year, scheduled so that each Ranger District is visited every two years.

## Annual Monitoring and Evaluation Report (Annual M&E Report)

Providing timely, accurate information about Forest Plan implementation to the decision makers and the public is a key requirement of the monitoring and evaluation strategy. The annual monitoring and evaluation report, which provides the analysis and summary of the monitoring results, is the vehicle for disseminating this information. As stated on page 4-6 of the 2005 Forest Plan this report, "...provides an opportunity to track progress towards the implementation of forest plan decisions and the effectiveness of specific management

practices. The focus of the evaluation is in providing short and long-term guidance to ongoing management.”

Evaluation is the process of transforming data into information—a value-added process. It is a process of synthesis that brings together value, judgment and reason with monitoring information to answer the question, “So what?” and perhaps, “Why?” Evaluation requires context. A sense of the history of the place or the circumstances (temporal and spatial context) are important to the evaluation of management activities. Evaluation describes movement from a known point (base line or reference condition) either toward or away from a desired condition. The desired conditions may or may not ever be fully achieved, but it is important to know if management activities are heading in the right direction. Evaluation produces information that is used to infer outcomes and trends: Conclusions will be drawn from an interpretation of evidence. These conclusions are documented in the Annual Monitoring and Evaluation Report.

The Annual Monitoring and Evaluation Report is not intended to be a comprehensive compilation of all the monitoring and evaluation described in the plan. While the report may provide summaries of data collected, it is primarily written to display evaluation of the data. The evaluation process determines whether the observed changes are consistent with Forest Plan desired future conditions, goals, objectives and what adjustments may be needed. Comparison of subsequent monitoring and evaluation reports provide a means to track management effectiveness from year to year and to show the changes that have been made or are still needed.

Key information displayed in the Annual Monitoring and Evaluation Report includes:

- Forest accomplishments toward achieving multiple use objectives for providing goods and services.
- The degree to which on-the-ground management is maintaining or making progress toward the desired conditions and objectives for the plan
- The effects of the various resource management activities within the plan area on the productivity of the land
- Conclusions and recommendations regarding the need to adjust monitoring or change the Forest Plan
- Status of other agency/institution cooperative monitoring
- Update of research needs
- Status of any Forest Plan Amendments or Administrative Corrections
- Documentation of any monitoring that has not been completed and the reasons and rationale (budget or staffing limitations or unexpected conditions, such as a severe fire season)

### **Use of Monitoring and Evaluation Information**

This report is of value for the public and Forest Service leadership, managers and employees. The Annual M&E Report describes to the public how their public lands are being managed and how effectively the commitments made to them through the 2005 Forest Plan are being met. The information gained from the Annual M&E Report is used to determine how well the desired conditions, goals, objectives, and outcomes of the forest plan have been met. The Annual M&E Report also provides a readily available reference document for Forest Service managers as they plan, evaluate the effects of actions on resources, and implement future

projects. The information can illuminate changes needed in project planning and implementation, or changes needed in Forest Plan direction.

The information contained in the Annual M&E Reports will also be used to inform the Comprehensive Evaluation Report (CER) which will be due January 2011 (five years after the implementation date of the revised plan.) The CER will build on the AMS developed for the Forest Plan revision, incorporating the monitoring and evaluation documented in the annual monitoring and evaluation reports. In the years that a CER is required, it will take the place of the Annual Monitoring and Evaluation Report.

## Monitoring Activities in Fiscal Year 2007 (FY 2007)

This report documents monitoring activities that occurred between October 1, 2006 and September 30, 2007 (Fiscal Year 2007.) Most of the projects monitored had been planned, and in some cases implemented, under the 1986 Forest Plan direction. Therefore, trends, patterns, and results from implementation of the 2005 Forest Plan are not clearly defined. On-the-ground changes to forest type composition, age structure, and other attributes will not be evident at this early date. In addition, evaluations and conclusions that would lead to changes in the Forest Plan are not expected at this point.

The type of monitoring most commonly reported herein is implementation monitoring. We believe it is important to first ensure that we are properly following the objectives, standards and guidelines established in our Forest Plan. This report also focuses on those monitoring questions that can be answered using existing corporate databases.

### Monitoring Field Trips

The Forest Monitoring Team conducted three monitoring field trips to three different project areas during FY 2007. The Districts conducted monitoring trips to 15 different project areas. Activities monitored included prescribed burns, timber harvest, salvage harvests, TSI/reforestation, special use permits, road reconstruction, and herbicide site prep with hardwood tree planting. The reports of these trips have been incorporated into this Annual report.

## Monitoring Results

The monitoring and evaluation described in this report is organized by the specific Forest Plan Goal (found in Chapter 1 of the 2005 Forest Plan) that drives each of the monitoring questions.

### Goal 1 – Promote Ecosystem Health and Sustainability

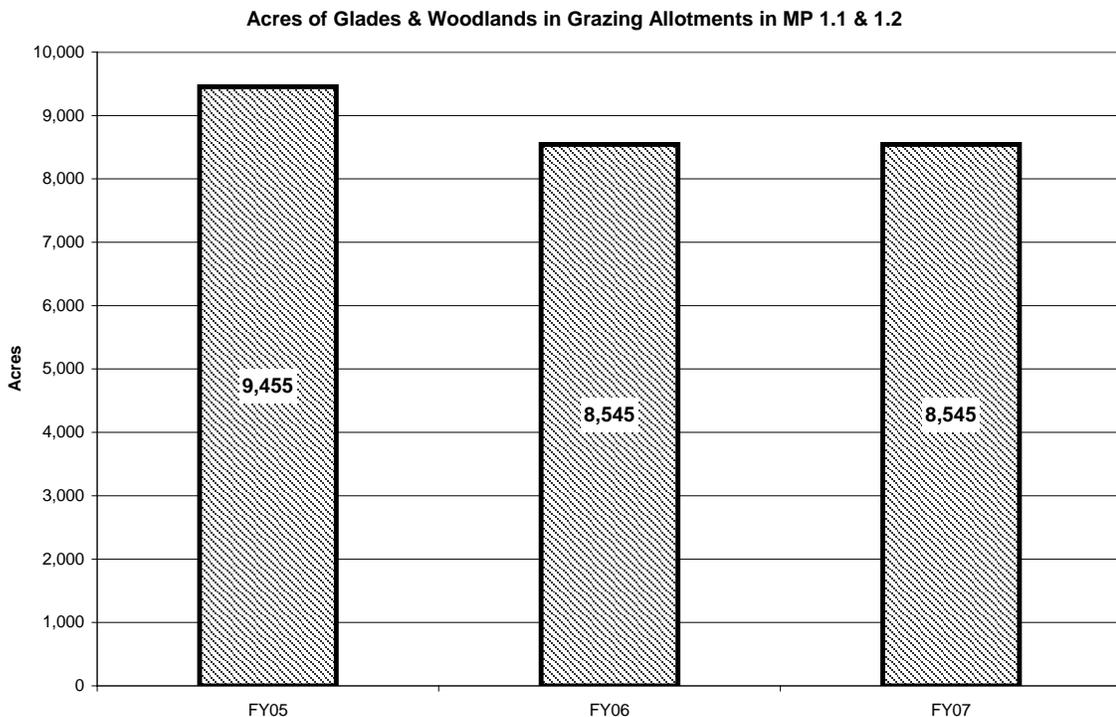
#### Goal 1.1 – Terrestrial Natural Communities

##### **Question – To what extent has domestic livestock grazing been removed from glades and woodlands in MP 1.1 and 1.2?**

Glades and woodlands are unique natural communities that provide habitat for many sensitive plant and animal species. Past heavy grazing has greatly diminished the original diversity of grasses, sedges and wildflowers on glades and in woodlands. Heavy grazing has accelerated eastern red cedar invasion. Consequently many glades and woodlands are currently degraded and outside their range of natural variability. Around 1969, open range was discontinued and intensive management of some glade communities began using cedar control and prescribed

fire. While this has improved the condition of some glade communities, they are far from being productive or sustainable ecosystems. Currently the general ecological condition of glade and woodland natural communities is poor. With few exceptions, existing glades and woodlands do not have sufficient natural integrity to reintroduce or sustain grazing in such a manner that would allow recovery of the natural community. Thus, the 2005 Forest Plan requires that domestic livestock grazing on glades and woodlands in MP 1.1 and 1.2 (where the primary emphasis is restoration of ecosystem health) be discontinued upon expiration of allotment permits.

There were five allotments that contained approximately 9,455 acres of glades and open woodlands when the ROD for the 2005 Forest Plan was signed. Almost 10% (910 acres, including 2 entire allotments) of the glade and woodland acres in grazing allotments in MP 1.1 and 1.2 were closed at the end of the FY 2005 grazing season, bringing the total acres to 8,544 in four separate allotments. No additional allotments were closed in FY 2006 or FY 2007. The permits for the remaining allotments will expire in FY 2008 and FY 2009, at which time all grazing allotments in glades and woodlands will be closed.



**Question – Are restoration activities increasing plant species richness for woodlands, glades and forests?**

**and**

**Question – Are we moving toward desired condition for groundcover and natural community type structural characteristics?**

The MTNF has adopted the Floristic Quality Index (FQI) methodology for tracking changes in plant species richness and percent ground cover change in woodland, glade and forest natural communities. High quality natural communities tend to be inhabited by groupings of plant species that are faithful to them. Midwestern ecologists assigned numerical values (between 0 and 10) to each native vascular plant species based on the ecological performance

observed in natural areas, and how these have responded to changes on the landscape resulting from modern disturbances. An index (the Floristic Quality Index or FQI) is derived by sampling and examining plant species composition for a given area based on how management is stratified (no management, prescribed burned only, thinned only or thin/burned). A detailed plant species checklist gives managers an idea whether an area will successfully respond to ecosystem restoration treatments. This numerical index is an expression of the relative integrity of the ecosystem, much like the optimal range of numerical indices established for cholesterol or blood pressure measurements in humans. The Nature Conservancy, Missouri Department of Conservation, Missouri Department of Natural Resources and the National Park Service use the FQI to address similar monitoring questions (over 100 separate monitoring studies in Missouri over past 15 years).

Monitoring plots are located within areas of analogous vegetation characteristic of a given described natural community type. This scientific method provides a sound way of obtaining a sufficient sample to allow inferences to be made to similar natural communities. In another words, when proper sampling procedures are followed, data from monitoring plots are used to infer results for the similar natural community type as a whole. The aggregates of all the monitoring plots assigned to similar or like stratifications (clearcuts, grazed glades, similar ELTs, untreated sites, etc) can then be analyzed as a single data set within respective Management Prescription 1.1 or 1.2 areas.

Field botanists first install baseline monitoring plots across a given representative project area. The number of plot settings range from 36 to 100, depending on the vegetation/natural community type within a specified ecoregion. After the initial baseline data is gathered, botanists resample the same plot settings following some type of vegetation management action. This is usually done every 4-5 years for herbaceous vegetation and as long as ten years for tree macroplot changes. Baseline data is being collected according to the following schedule:

Project location	Ranger District	Vegetation type	# of Plots	Year completed
Pineknot	Eleven Point	Shortleaf pine/bluestem woodland	100	2000, 2001, 2005
Ava Glades	ACW	Dolomite glades; oak woodlands	72	2006
Western Star Savanna & Kaintuck Hollow	HRC	Post oak savanna and woodland; glade	36	2007
Cassville Glades	ACW	Glade; pine woodland	36	2007
Medley Hollow	Salem	Pine/oak woodland	36	2008 ongoing
Fredericktown	Potosi	Oak/pine woodland	36	2009 planned
Cane Ridge	Poplar Bluff	Pine bluestem woodland	36	2010 planned

During FY 2007, contract botanists (individuals with demonstrated field familiarity with the local vascular flora) established and collected data on 72 plots on the Cassville Glades and Western Star Savanna – Kaintuck Hollow to establish the baseline condition for these community types. This data was entered into FS Veg for report tracking and retrieval.

Analysis generally must rely on at least two repeat collections of data at the same sampling location (following significant management treatments) to measure changes/trends in data. Since only one collection of data has occurred at the Cassville Glades and Western Star Savanna – Kaintuck Hollow, there are no results to report for these community types.

The Nature Conservancy resampled vegetation data in 2005 in the Pineknot Project, following approximately 6,500 acres of prescribed burns and some thinning treatments. The analysis of plant data collected before and after vegetation treatments at Pineknot showed some trends toward desired plant species richness and ground cover in this pine woodland

natural community. However, the report indicated that this difference in plant species richness and ground coverage could be improved had the appropriate thinning to desired basal areas been more effectively accomplished.

**Question – What progress has been made towards meeting Objectives described in Chapter 1 of the Forest Plan?**

*Objective 1.1a – Within Management Prescription 1.1 areas, apply management activities to move natural communities towards restoration in the amounts shown in Table 1-1 [on page 1-2.]*

and

*Objective 1.1b – Within Management Prescription 1.2 areas, apply management activities to move natural communities towards restoration in the amounts shown in Table 1-2 [on page 1-2.]*

The FACTS database shows a total of 310 acres of management activities in Management Prescription 1.1 and 1.2 in FY 07. However, many records in FACTS have no management prescription recorded, or have management prescriptions that were used in the 1986 Forest Plan and are no longer valid. In addition to what is shown in FACTS, we know that in 2007 approximately 2,500 acres were prescribed burned at Cane Ridge, and 6,900 acres were prescribed burned at Brushy Creek/Clayton Ridge.

The only new project decision made for Management prescription 1.1 or 1.2 in FY07 was for the Bateman, Sheeks, Oremus and Robertson Tract Open-lands Project, which authorized grazing on newly acquired pastures. In 2006, the only project decision made in 1.1 or 1.2 management prescription areas was the Brushy Creek/Clayton Ridge Burn. After two years implementing the new 2005 Forest Plan, scheduling of new projects in MP 1.1 and 1.2 does not seem to be keeping pace with the new plan objectives for ecosystem restoration. Until decisions with natural community restoration objectives are made for projects in the 19 MP 1.1 and 1.2 management areas, and the associated vegetation treatments commence, we cannot expect to see any favorable trends in plant species richness/ground cover increases.

**Goal 1.2 – Non-Native Invasive Species**

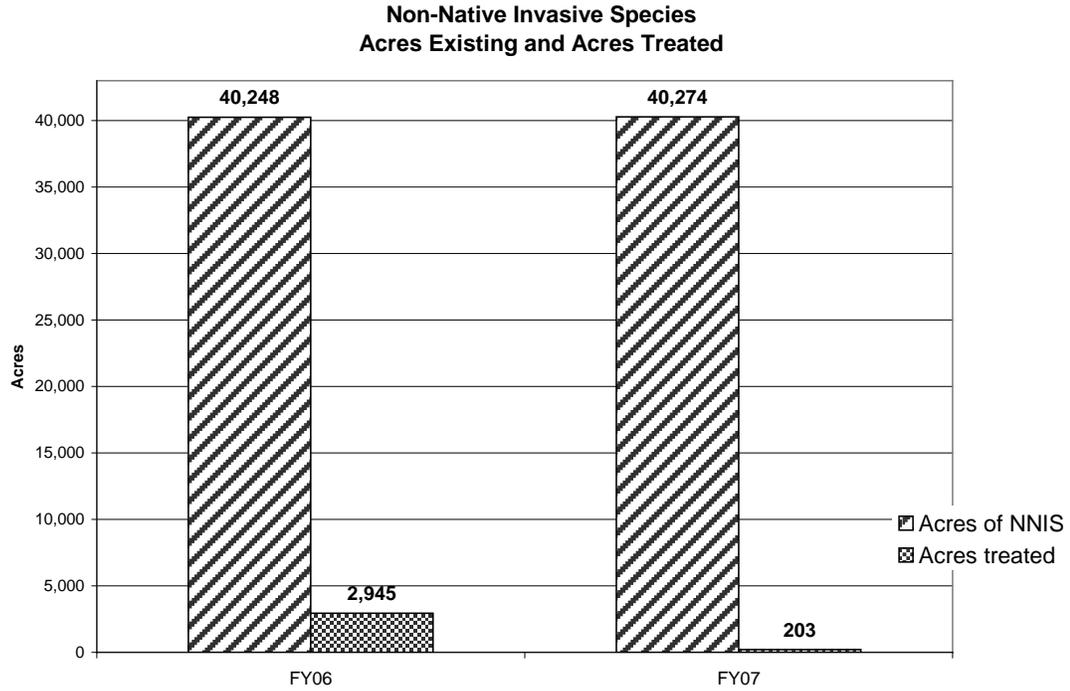
**Question – To what extent is Forest management contributing or responding to non-native invasive species (NNIS)?**

The Chief of the USDA Forest Service has identified invasive species as one of the four critical threats to our nation’s ecosystems. Non-native invasive species (NNIS) include terrestrial and aquatic plants and animals. Infestations of NNIS increasingly threaten the integrity of the ecosystems and biodiversity on the MTNF. Of particular concern are those NNIS that are successful at invading natural habitats.

There are a total of 40,274 acres on the MTNF known to be infested with NNIS plants. Throughout the MTNF, NNIS plants are most abundant in regularly disturbed areas such as roadsides, grazing allotments and old fields. NNIS infestations associated with some management activities on the MTNF include 2,092 miles of roadsides, 1,037 acres of developed recreation sites, 145 acres of dispersed recreation sites, 250 acres of powerlines, and 5,396 acres of range allotments. During FY 2007, 203 acres were treated for NNIS plants.

Missouri’s feral hog population continues to grow in size and expand in range. There are no accurate estimates for feral hogs on MTNF lands, but they are known to exist in many areas on the Forest. Evidence of feral hogs was noted during the SO monitoring trip to the Brushy

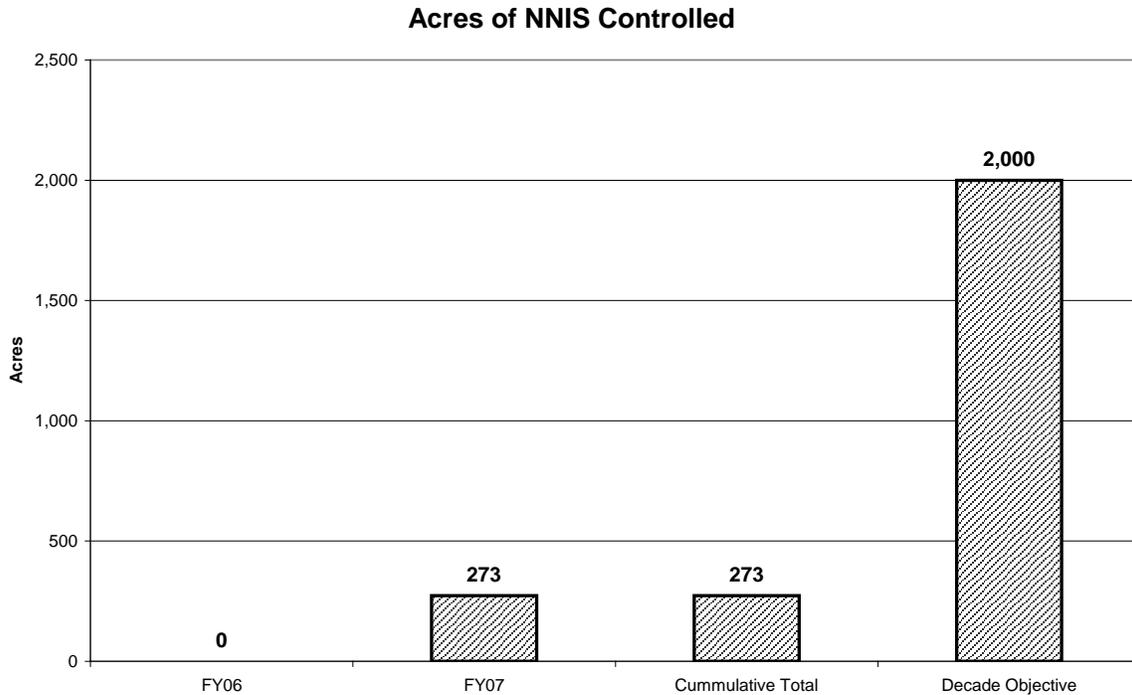
Creek/Clayton Ridge Project area. In FY 2007, the MTNF continued its efforts to eradicate feral hogs through a cooperative agreement with USDA-APHIS.



**Question – What progress has been made towards meeting Objectives described in Chapter 1 of the Forest Plan?**

*Objective 1.2a – Control a minimum of 2000 acres of existing non-native invasive species infestation.*

Control of non-native invasive species means to significantly limit the spread of a noxious weed infestation. In FY 2007, 273 acres of treated acres were monitored and the infestation reported as controlled.



### Goal 1.3 – Soils, Watersheds, and Water Quality

**Question – Are the effects of Forest management, including prescriptions, resulting in significant changes to productivity of the land?**

The methods outlined in the Monitoring Guide for answering this question include qualitative assessments (mostly ocular) of the activity areas during Monitoring Field Trips. These observations are then to be compared to the R9 Soil Quality Condition Monitoring Protocol (FSH 2509.18-2002-1) to determine if “detrimental soil conditions” are occurring.

Monitoring was conducted in all seasons, across the forest, in prescribed burn units and timber sale areas. Monitoring reports and reports from timber sale administrators confirm that forest plan standards and guidelines for soil and water protection are effective and working and soil productivity is not being changed significantly.

**Question – To what extent is Forest management affecting water quality, quantity, and the physical features of aquatic, karst, riparian, or wetland ecosystems?**

Field monitoring of harvest units, temporary road construction, road maintenance, and trail construction projects found that stream channels and special habitats were being protected, and that all mitigation measures had been followed.

The Ava/Cassville/Willow Spring Ranger District has 2 projects underway which will eliminate Riparian Management Zones from haying and grazing, which will help protect these riparian areas and water quality.

In FY 2007, approximately 10 acres of wetlands were improved and protected by fencing 3 fens to exclude feral hogs and ATV’s and blocking roads to several fens to restrict motorized access. In addition, at least 2 fens were included in prescribed burn units to reduce the amount and vigor of woody vegetation.

**Question – What progress has been made towards meeting Objectives described in Chapter 1 of the Forest Plan?**

Forest Plan Objective	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	Total
1.3a – Stabilize <b>10 miles</b> or more of stream reaches	0	1									1
1.3b – Restore or enhance <b>125 acres</b> of bottomland hardwood forest	0	51									51
1.3c – Increase large woody material loading in <b>3 miles</b> or more of streams or rivers	0	0									0
1.3d – Protect and improve <b>900 acres</b> of wetlands	0	10									10

**Goal 1.4 – Wildlife and Aquatic Habitat**

**Question – To what extent are forest management activities providing habitat for Management Indicator Species (MIS)?**

*Red Bat* - Spring and summer bat surveys (mist-net and acoustic) were conducted on the Forest May through July 2007. Red bats were the second most common bat captured on the Salem and Potosi/Fredericktown Districts. On the Poplar Bluff District, red bats comprised 27% of bats captured. They were the second most captured species behind northern long-eared bats. In previous years, red bats have been the most captured species. Whether or not this change indicates a real change in numbers of red bats is unknown at this time. It may also be a positive change in numbers of northern long-eared bats (most captured), a change in capture rate due to weather or other factors, or some sort of change in netting locations or other conditions. (See last section on management of open woodlands).

*Bird Survey Methods:* The Forest uses the USGS Breeding Bird Surveys to evaluate species trends for Missouri and the Ozark/Ouachita Plateau region. There are 6 (Hilda ACW; Williamsville PB; Centerville SAL; Cascade PF; Ironton PF; and Bennett EP) Breeding Bird survey routes with some portion of the route running through National Forest System lands. We look at trends within the last year (data is available through 2006), since the 1986 Forest Plan was implemented, and long-term (since 1966 when the Breeding Bird routes first started keeping data).

**MIS Birds Trend Analysis for BBS Routes through Mark Twain National Forest  
Route Changes 1966-2006  
January 2008**

MIS Species	PB	ACW	SAL	EP	PF	PF	Overall Trend
	Williamsville	Hilda	Centerville	Bennett	Ironton	Cascade	
Summer Tanager	5.41	0.88	1.62	1.26	21.81	1.16	increasing
Northern bobwhite	-7.99	-2.17	-6.01	-37.13	-16.02	-7.26	decreasing
Worm-eating warbler	-4.67	-8.9	22.61	-2.68	26.13	6.32	mixed, but fairly stable <sup>1</sup>

<sup>1</sup>Data for worm-eating warbler is misleading - raw data & population graphs show fairly stable numbers, with some routes having only a few individuals per year.

On the routes with at least some portion running through MTNF lands, summer tanager appears to have had an increasing trend over the past 40 years, northern bobwhite has had a large decrease, and worm-eating warbler shows fluctuations over the years, but in general a fairly stable trend over the 40 year period. These data are consistent with the larger regional trends of these species in the Ozark/Ouachita Plateau region.

In addition, there are two short routes done annually by the Forest Service that are not included in the USGS database (Big Barren and Ridgetop on the Eleven Point District). In

spring 2007, these routes found 33 summer tanagers in 35 stops, and 6 worm-eating warblers. No northern bobwhite or Bachman's sparrows were heard or seen.

There were 61 bird point counts conducted on the Forest in 2007 on the Poplar Bluff District in conjunction with the Missouri National Guard. Since this was the first year for those points, there is no way to compare results to determine any trends. However, summer tanagers were heard at 34 of the 61 points (56%) and worm-eating warblers were found at 14 of the 61 points (23%). Northern bobwhite was heard on private lands, but not National Forest. No Bachman's sparrows were heard at any of the points.

*Summer Tanager* - Trends from the North American Breeding Bird Survey (USGS 2008) for the Ozark/Ouachita Plateau show a relatively steep decline for 2005 to 2006, but a very slight increasing trend from 1986 to 2006 and basically stable in the long-term. (See last section on open woodlands management).

*Bachman's Sparrow* – Trends from the North American Breeding Bird Survey (USGS 2008) for the Ozark/Ouachita plateau show a slight increase from 1986 to 2006, but long-term a basically stable trend. However, the number of routes and average counts are so low that these data may be inaccurate. There was no data for trends from 2005 to 2006 for Bachman's sparrow. Information from Andy Forbes, MDC, indicates that Bachman's sparrows are still hanging on in southwestern Missouri glades, but in very limited numbers. (See sections on glades and glade species).

*Worm-eating warbler* - Trends from the North American Breeding Bird Survey (USGS 2008) for the Ozark/Ouachita Plateau show a fairly steep decline from 2005 to 2006, but with stable trends from 1986 to 2006 and long-term (1966-2006). (See last section on proportion of MTNF in forest and woodland).

*Northern Bobwhite* – The statewide harvest and population status report for 2007 provides an index of quail abundance reflecting conditions primarily on private lands, since most of the roadside surveys run through private lands (MDC 2007). Although the statewide index is 10% below last year's count, **the Ozark Plateau, where most of MTNF lands lie, had relatively moderate counts which are close to the 13 year average, and actually a bit higher than last year.** Areas with good habitat should still have good numbers of birds. The statewide downward trend is reflective of Missouri's overall poor habitat – overgrazed pastures, overgrown fields, thick grass stands, removal of hedgerows, grassy rather than woody waterways, and red cedars infesting grasslands.

Trends from the North American Breeding Bird Survey (USGS 2008) show steeply declining trends for 2006 compared to 2005 in the Ozark/Ouachita Plateau region; as well as declining trends for the period 1986-2006, and long term (1966 – 2006).

(See sections on open woodlands, glades, and native grasslands).

**Question – To what extent is Forest management contributing to the conservation of sensitive species and moving toward objective for their habitat conditions?**

*Aquatic species* – The Forest's hydrologist was on extended detail in FY 2007 and therefore, the water quality data needed to compare to aquatic species life history needs is not available. However, the Forest did accomplish several projects that would benefit aquatic and riparian species by providing vegetation structure and ground cover to help hold soil adjacent to streams and rivers. Riparian hardwood trees were planted in fescue fields along Spring Creek on the HRCC District (long-term species benefited include: bald eagle, mussels including federal listed, cerulean warbler). Cane was manually transplanted to locations along East Bull Creek on the Ava District (species benefited include Swainson's warbler, state endangered) which will help stabilize soils along creek and keep water quality high.

*Glade species* –Baseline vegetation data was collected in 2007 on 57 glade plots throughout the Forest. Additional woodland and forest plots will be established and data collected in the next 2 years. It will probably be at least 5 years before any significant changes due to management would be reflected in the vegetation data from these plots. Until that time, we will have to use acres treated as a substitute. In 2007, prescribed burning was accomplished on 3164 acres of glades and 1290 acres of cedar thicket (overgrown glades). See glade discussion below.

*Woodland and Forest species* – Baseline vegetation data was collected in 2007 on 75 woodland plots throughout the Forest. Additional woodland and forest plots will be established and data collected in the next 2 years. It will probably be at least 5 years before any significant changes due to management would be reflected in the vegetation data from these plots. Until that time, MIS summer tanager and red bat may be used as a surrogate for this information. See woodland/forest discussion below.

*Bluff and cave species* – Cave/karst specialist Randy Long discovered 7 new caves on MTNF lands, rediscovered locations for 6 caves, and monitored physical and biological condition of 17 caves. Biologists monitored 19 caves, and 22 caves were visited by Cave Research Foundation (CRF) under a Challenge Cost Share Agreement: (biological inventories completed on 12 caves and mapping done in 16 caves). A bat friendly gate was installed at Knife Cave on the HRCC District. Otter use was documented in 2 caves. No new or noteworthy management problems were mentioned by CRF or in District monitoring reports.

*Wetland species* – In FY 2007, 3 fens were fenced to exclude feral hogs and ATV’s. Roads were blocked to several fens to restrict motorized access. At least 2 fens were included in prescribed burn units to reduce the amount and vigor of woody vegetation. Additional prescribed burning, vegetation control, and motorized access restrictions were identified as continuing needs on several MTNF fens. Wetlands, including fens will need continual monitoring to ensure their protection from threats such as feral hogs, illegal ATV use, and woody vegetation encroachment.

*Bird population trends* – See discussion of MIS above. Other bird population trends that may be of interest include are shown in the following table.

**Bird Population Trends Ozark-Ouachita Plateau  
Jan-08**

General Habitat Association	Species	Short-term 2005-2006	Since 86 Forest Plan 1986-2006	Long-term 1966-2006
Riparian	Cerulean warbler	NI	+	0+
	Wood duck	+	+	++
	Green heron	NI	-	-
Generalist	Wild Turkey	++++	0-	+
Open/Semi-open	Prairie warbler	----	-	--
	Yellow breasted chat	--	0+	0+
	Field sparrow	NI	-	-
	Indigo bunting	-	0+	0+
	Eastern kingbird	++	-	0-
	Loggerhead shrike	+++	--	--
	Brown-headed cowbird	+++	-	-
Pine woodland/forest	Cooper's hawk	NI	--	-



per acre on National Forest system lands. The total number of dead trees from 2” dbh to 40 “ dbh on MTNF lands is about 17,300,000 or about 11 snags per acre.

The gate in Bat Cave in Ozark County (gray bat maternity cave) was replaced this year with a newer design. All other gates at occupied bat caves on the Forest are structurally sound. However, even the best gates are subject to persistent efforts to breach them. White’s Creek Cave still has a spot that has one bar loose and needs re-welding. Cave Hollow Cave at Potosi has a consistent record of break-ins, including one where a welding torch was used to cut the bars. The District is working with law enforcement to limit motorized access to the cave and to apprehend those responsible for continued attempts to break-in the cave.

There are no known cases of prescribed burns on MTNF adversely impacting Indiana or gray bats in 2007.

There are two locations where Indiana bat maternity colonies have been identified. Both have areas of use designated (Brown’s Hollow in 2004 and Salem/Potosi in 2005) as required by Forest Plan standards. No Forest management activity occurred within the Brown’s Hollow AOU in 2007. No Forest management activity occurred on the Salem part of the Salem/Potosi AOU. On the Potosi side of the Salem/Potosi AOU, there are two timber sales which had some harvest activity in 2007. One of those sales was completed, but the other is just getting started. In this area, the harvest activity is limited to the November – March period. One sale unit was dropped to protect a maternity roost tree.

All known male roost trees are being protected from physical disturbance. Planned timber sales and prescribed burns on the Salem District were monitored by the District biologist. One sale unit was dropped in order to eliminate the need for special harvest restrictions. On the Salem and Potosi/Fredericktown District, all male roost trees have been located with GPS, painted with orange paint (reserve trees) and tagged. Sale unit boundaries have been modified to create buffers around these trees.

*Hine’s emerald dragonfly* – All known locations of Hine’s emerald dragonfly (HED) are being monitored to detect any current or future threats. Several fens have been fenced to exclude ATV’s and feral hogs, including Bates Hollow Fen in 2007. Others have had access modifications to prevent motorized access into the fen area.

Two prescribed fires were planned to reduce woody vegetation in fens and improve habitat for HED. Casey Fen on the Salem District was included as part of a prescribed burn, but the fire did not carry into the fen and so did not accomplish the woody species reduction that was planned. Flagmire Fen was also part of a larger prescribed burn and part of the fen burned well, reducing woody vegetation as intended.

*Mussels* –The Sutton Bluff project on the Salem District will improve aquatic organism passage by replacing a low-water crossing with a culvert design. As required by the Forest Plan, analysis was conducted which showed mussel habitat was not available within the project area, or downstream where effects might be felt. No other in-stream, low-water crossing or fords, which could have the potential to affect threatened, endangered or rare mussel species, were planned or implemented in FY07.

**Question – Are specialized habitats (caves, fens, seeps, springs, cliffs, rock outcrops, wetlands, etc) being protected, maintained and restored?**

Specialized Habitat	District						TOTAL
	ACW	EP	HRCC	PB	PF	SAL	
Caves (TES)	1	1	1	0	2	1	6
Caves (non-TES)	1	0	3	0	3	6	13

Fens (HED)	0	0	1	0	1	3	5
Fens (non-HED)	1	0	0	0	7	1	9
Seeps, springs	1	0	0	1	1	0	3
Cliffs, rock outcrops	2	0	0	0	1	0	3
Glades	1	0	0	0	5	1	7
Other	1	0	0	1	8	0	10
<b>TOTAL</b>	<b>8</b>	<b>1</b>	<b>5</b>	<b>2</b>	<b>28</b>	<b>12</b>	<b>56</b>

*Ava/Cassville/Willow Springs* – All specialized habitats monitored in 2007 were in relatively good shape. Several road/trail closures are proposed to restrict motorized access to these habitats. The fen and glade were identified as needing prescribed burning to rejuvenate ground vegetation and reduce woody vegetation. Monitoring for ATV and feral hog damage was identified as a continuing need.

*Eleven Point* – Due to a change in biologist duties during the year, only one special habitat was monitored during 2007. The cave gate was in relatively good condition and there is no evidence of visitation while the gate is closed. There is one bar of the gate that needs to be rewelded.

*Houston/Rolla/Cedar Creek* – The need to switch from spring to growing season burning at Kaintuck fen was identified to reduce woody vegetation and encourage the growth of forbs. A bat friendly gate was installed at Knife Cave, an Indiana bat hibernaculum.

*Poplar Bluff* – Problems identified include illegal ATV use on a horse trail adjacent to a spring, and trash/vandalism at a sinkhole pond/spring.

*Potosi/Fredericktown* – Caves are heavily used by recreationists and the gate at Cave Hollow Cave continues to be vandalized. Without exception, the glades monitored needed prescribed fire to rejuvenate ground vegetation and some type of activity to reduce woody encroachment. One previously fenced fen is recovering well from ATV disturbance. Some management needs were identified.

*Salem* – All sites were in good condition, with protective/management measures accomplishing their intended effects. Some future threats and monitoring needs identified.

**Question – What progress has been made towards meeting Objectives described in Chapter 1 of the Forest Plan?**

*Objective 1.4a – Improve open woodland conditions on at least 10,500 acres to provide habitat for summer tanager, northern bobwhite, Bachman’s sparrow, and eastern red bat.*

Prescribed burning was accomplished on about 9,000 acres of woodland habitat; some were first burns and some were repeated burns. About 6,500 acres had commercial harvest with single tree selection. Assuming none of the harvested acres were included in a burn unit, about 15,500 acres were treated. This is about 1% of MTNF acres and about 150 % of the Objective 1.4a for open woodland. **However, it is doubtful that any of these acres have reached the desired future condition** – we have just moved them toward that condition, but it will take more work to achieve the desired condition. Eight northern bobwhites were flushed from a prescribed burn unit on the Poplar Bluff District the day after the burn occurred.

*Objective 1.4b – Increase the proportion of managed native grasslands to that of exotic cool season grasses from the current 46% native grass to 55% native grass to provide habitat for northern bobwhite*

CDS data shows about 37,000 acres of grasses on MTNF. About 36% of that is coded as warm season grasses. The Forest Plan objective is to have at least 55% (or about 20,350 acres) in native grasslands. **That means about 7,000 acres still need to be converted from cool season grasses to native grasses.** The Houston/Rolla/Cedar Creek District and National Wild Turkey Federation, in partnership, are converting old fescue fields to warm season grasses. Herbicide was applied in FY2007, and seeding will take place in FY 2008.

*Objective 1.4c – Maintain forest, closed woodland or open woodland cover over 85% or greater of Mark Twain National Forest acres to provide habitat for worm-eating warbler.*

FIA data show that there are 1.49 million acres of forestland on the Mark Twain National Forest. This is about 99% forest cover. Objective 1.4c states that over 85% of MTNF should be in forest or woodland cover. Obviously, the Forest is well above meeting this objective. However, most of the acres have a long way to go before reaching desired condition for their natural communities.

*Objective 1.4d – Treat at least 4,000 acres of glades to reduce wood vegetation to provide habitat for Bachman’s sparrow.*

McClurg Glade (102 acres) and Brushy/Clayton (3,062 glade acres) on the Ava District were prescribed burned in 2007. In addition, about 1,290 acres of cedar thicket (overgrown glades) was burned in the Brushy/Clayton unit. This is about 12% of the estimated 36,000 acres of glades on MTNF, and slightly exceeds the 4,000 acre Objective 1.4d for glade habitat.

**However, the treated acres may need additional treatment before being considered as optimum Bachman’s sparrow habitat.**

*Objective 1.4e – Designate permanent old growth on 8% to 12% of each 2.1 and 6.2 management area, and on 15% - 20% of each 6.1 management area.*

Permanent old growth was designated on 7,472 acres Forest-wide (1,320 acres on Poplar Bluff; 1,270 acres on Houston/Rolla/Cedar Creek; 3,577 acres on Potosi/Fredericktown; and 1,305 acres on Eleven Point).

This is only 0.78% of the Management Prescription 2.1, 6.1 and 6.2 acres. Objective 1.4e states that 8-12% of each MP 2.1 and 6.2 and 15-20% of each 6.1 MP be designated as permanent old growth. **At this rate, it will take at least 11 years to meet this objective.**

## **Goal 2 – Provide a Variety of Uses, Values, Products, and Services**

### **Goal 2.1 – Public Values**

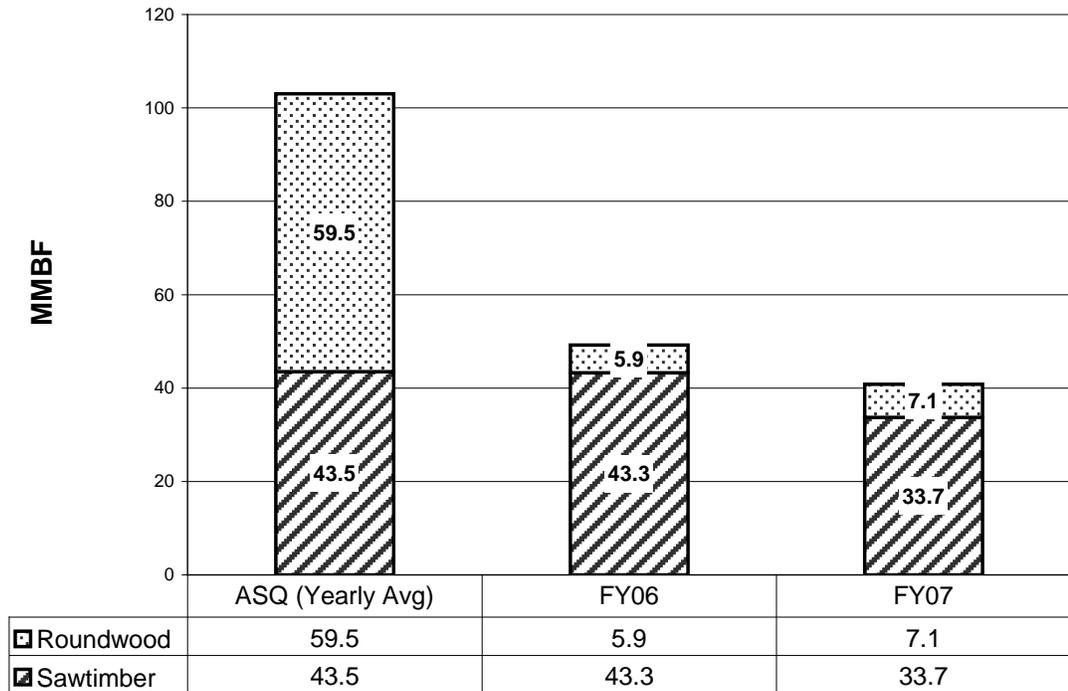
#### **Question – How close are projected outputs and services to actual?**

The Allowable Sale Quantity (ASQ) for the first decade of 2005 Forest Plan implementation is 1,030 million board feet (MMBF), which equates to an annual average of 103 million board feet per year. The ASQ is a maximum capacity of suitable land to grow timber volume on a long-term sustained yield basis under a given management scenario (Forest Plan). While the amount of timber sold in any given year can exceed the annual average, the total amount sold over the decade cannot exceed 1,030 million board feet (MMBF). ASQ is not a target. The actual amount of timber sold in any given year may vary based on the budgets received, the Forest’s capability to implement projects, changes in the timber market, insect and disease outbreaks, and any number of other variables.

The model used to determine the ASQ estimated that roundwood products would constitute the majority of the products sold (59.5 MMBF or 58% of the total), with sawtimber products accounting for the remainder (43.5 MMBF, or 42% of the total.) This emphasis on smaller material is due to the heavy need for thinning of forested stands throughout the Forest.

The following chart shows the timber sold in FY 2006 and FY 2007. Total timber sold decreased by about 17% from FY 2006. The amount of sawtimber sold was down approximately 22%, while sales of roundwood increased by about 20%. Sawtimber sold was almost 75% of the projected output. The roundwood products sold were only 12% of that projected, indicating that the thinning needs are not being met.

Comparison of Projected & Actual Timber Outputs (Timber Sold)

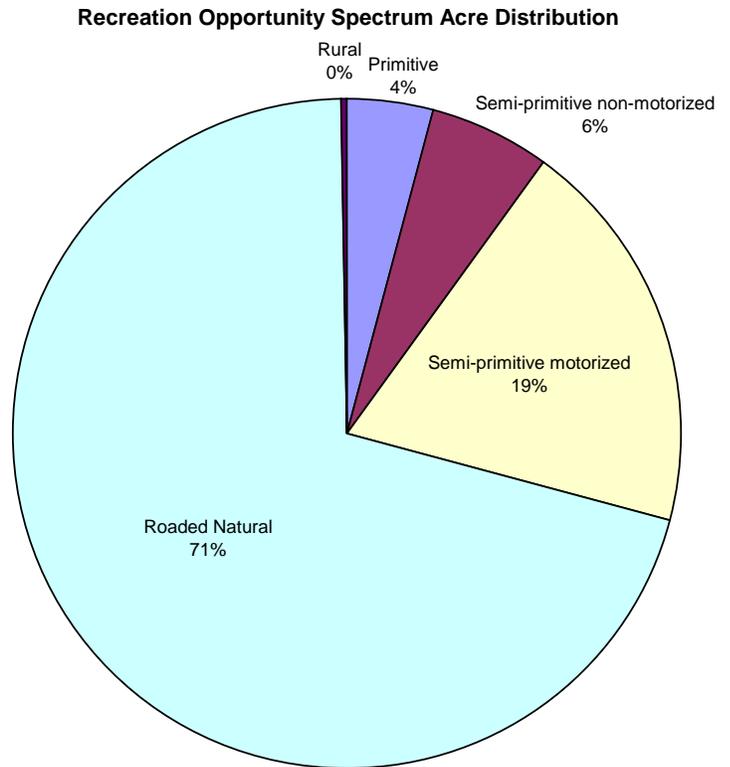


In addition to the projected timber output, the Forest Plan also estimated the proposed and probable management activities that would be used to work toward the vegetative and other multiple-use desired conditions and objectives of the Forest Plan, based upon modeling estimates. Again, these are not targets, and actual treatments during plan implementation may vary from these modeled outputs. The following table compares the estimated decade totals for the proposed and probable management activities to the actual activities implemented. (Information regarding acres of red cedar reduction, non-commercial thinning, skid trails, and miles of temporary roads was not readily available for FY 2006 or 2007.)

Management Activity	Unit	FY06	FY07	Cumulative Decade Total	Estimated Decade Total
Commercial Thinning	acres	3,340	3,679	7,019	99,800
Pre-commercial thinning and release	acres	3,278	3,662	6,940	40,200
Regeneration cut	acres	2,321	3,942	6,263	112,700
Temporary roads	miles	N/A	N/A	N/A	1,500
Skid Trails (1 mile = .96 acres)	acres	N/A	N/A	N/A	4,000
Non-commercial thinning	acres	N/A	N/A	N/A	8,400
Red Cedar Reduction	acres	N/A	N/A	N/A	12,600
Prescribed Burning	acres	17,888	22,109	39,997	688,000
Hazard Fuels Treatment - Mechanical	acres	2,000	2,592	4,592	149,200

**Question – To what extent is the Forest providing a range of motorized and non-motorized recreation opportunities that incorporate diverse public interests yet achieve applicable Management Area and Law Enforcement objectives?**

The Recreation Opportunity Spectrum (ROS) is a planning tool used to identify, evaluate, and define the supply of recreation settings on the national forests. Each management prescription in the 2005 Forest Plan has a ROS class objective which describes the desired condition for the lands allocated to that management prescription. The land allocations were designed to provide a range of recreation opportunities to satisfy diverse public interests. Approximately 90% of the MTNF is allocated to management prescriptions that allow motorized recreational activities, with the remaining 10% providing for non-motorized recreation. The chart to the right illustrates the allocations made by the 2005 Forest Plan. Changes to these percentages could result from land exchanges, purchases, or changes to the management area prescription for a given area. There were no significant changes to the ROS distribution during FY 2007.



**Question – Does Forest management of utility, recreation, and other use permits meet Forest Plan and agency direction?**

At the end of FY 2007, the MTNF was administering 984 permits of all types, with 716 (73%) administered to standards as tracked in SUDS. “Administered to standard” means that the authorizing documents are current, inspections have been done and any needed corrective actions taken, permit fees have been paid, etc. This exceeded the Forest target by 466. During FY 2007, the Forest issued 103 permits, exceeding our target by 63, and amended four existing permits.

Some 80% of special use permits issued on the Forest are for transportation systems, including private, county and state. Utility rights-of-way, including electric, crude oil, natural gas, water and communications, comprise 9% of all special use permits. Permits authorizing the operation of recreation facilities, group events, and recreational outfitters and guides account for 4% of the total.

The Forest administers the special use program with three zoned Realty Specialists. The zones are Fredericktown, Salem and Potosi units (approximately 360 permits); Eleven Point, Poplar Bluff and Willow Springs (approximately 270 permits); Ava, Cassville, Cedar Creek, Houston and Rolla (approximately 270 permits).

The Forest Program manager verifies data in the Special Uses Data System (SUDS), including closing permits, works with zones to renew expired permits, reviews NEPA

documents and recommends for Forest Supervisor’s signature, and works with Districts to insure Forest Plan standards and guidelines are followed in permit authorizations and administration.

**Question – What are the effects of MTNF management on people and communities in areas adjacent to the forest?**

"Payments in Lieu of Taxes" (or PILT) are Federal payments to local governments that help offset losses in property taxes due to nontaxable Federal lands within their boundaries. PILT payments help local governments carry out such vital services as firefighting and police protection, construction of public schools and roads, and search-and-rescue operations. PILT payments are one of the ways that the Federal government can fulfill its role of being a good neighbor to local communities.

The Secure Rural Schools and Community Self-Determination act of 2000 (SRS) (PL 106-393) was enacted to provide transitional assistance to rural counties affected by the decline in revenue from timber harvests in federal lands. Traditionally, these counties relied on a share of receipts from timber harvests to supplement local funding for school systems and roads. On September 30, 2006 the SRS authorization ended. The last payment under this authorization was made in December of 2006. P.L. 110-28, the Iraq Accountability Appropriations Act of 2007, was signed into law by President Bush on May 25, 2007. The Act contains a provision that provides for payments under the Secure Rural Schools and Community Self-Determination Act of 2000 for FY 2007.

Some federal lands are leased to individuals and companies for minerals development. Lease holders competitively bid, initially pay a bonus and subsequently, rent for the right to develop these minerals. If minerals are found, extracted and sold, the federal government is entitled to a certain percentage of, or royalty on, the production. Distribution of revenues associated with onshore federal lands is split 50-40-10, with 50 percent of the money going directly to the state within which the specific lease was located. Forty percent is sent to the Reclamation Fund of the U.S. Treasury. This special account finances the Bureau of Reclamation's water projects in 17 western states. The remaining 10 percent goes to the Treasury's General Fund.

The following table shows the payments made to counties containing National Forest System (NFS) lands. SRS and Minerals payments are made to the State; the distribution by county shown below is based on the acres of NFS lands in each county.

County	NFS Acres	PILT Payments	SRS Payments	Minerals Payments	Total Payments
Barry	55,183	\$57,577.31	\$102,100.75	\$134,742.96	\$294,421.02
Bollinger	1,646	\$1,836.00	\$2,920.25	\$4,019.12	\$8,775.37
Boone	4,142	\$5,173.00		\$10,113.72	\$15,286.72
Butler	44,459	\$47,973.92	\$90,419.74	\$108,557.66	\$246,951.32
Callaway	12,184	\$15,031.38	\$13,087.07	\$29,750.25	\$57,868.70
Carter	90,640	\$90,905.88	\$170,240.02	\$221,320.01	\$482,465.91
Christian	51,597	\$57,537.87	\$96,801.03	\$125,986.86	\$280,325.76
Crawford	50,053	\$55,102.00	\$93,231.83	\$122,216.80	\$270,550.63
Dent	72,800	\$72,102.96	\$132,060.40	\$177,759.23	\$381,922.59
Douglas	40,910	\$44,924.00	\$76,900.04	\$99,891.90	\$221,715.94
Howell	50,421	\$55,804.00	\$92,042.10	\$123,115.36	\$270,961.46
Iron	95,649	\$91,363.00	\$179,217.11	\$233,550.73	\$504,130.84
Laclede	30,026	\$33,316.00	\$54,186.95	\$73,315.92	\$160,818.87
Madison	51,341	\$56,732.00	\$94,313.41	\$125,361.77	\$276,407.18

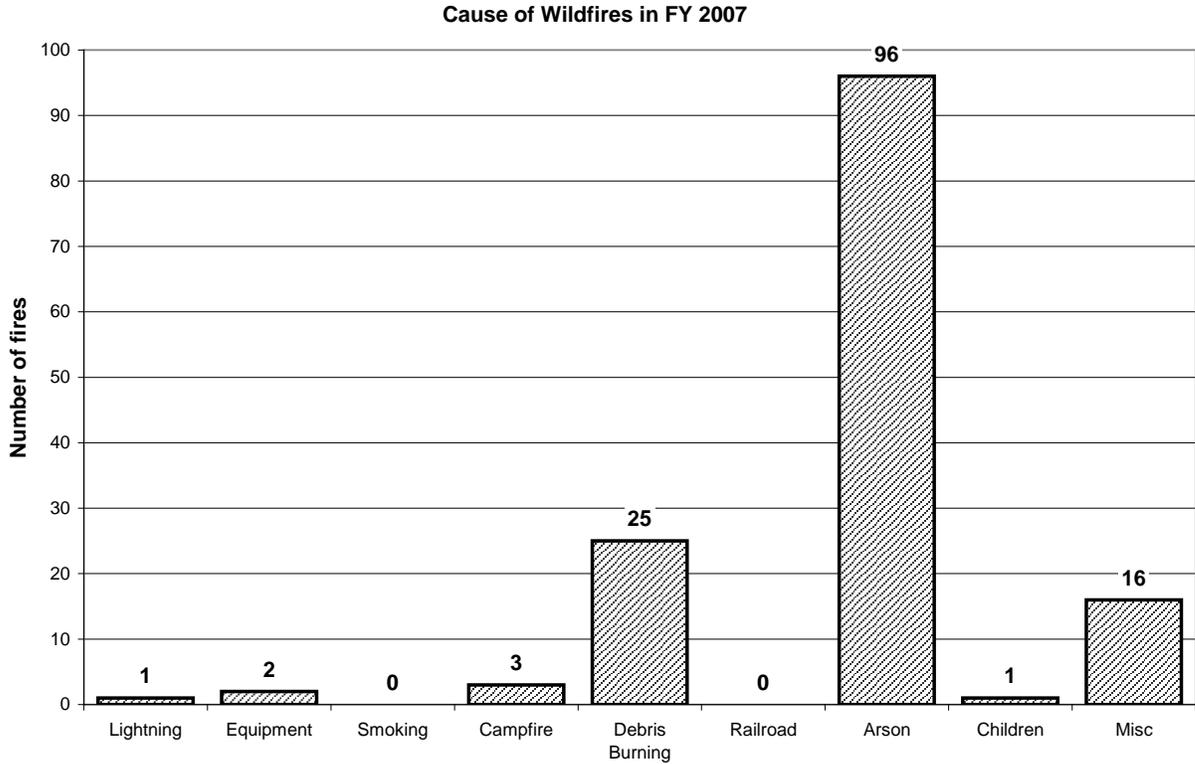
County	NFS Acres	PILT Payments	SRS Payments	Minerals Payments	Total Payments
Oregon	105,630	\$103,391.00	\$191,222.59	\$257,921.81	\$552,535.40
Ozark	38,672	\$46,919.50	\$72,573.74	\$94,427.27	\$213,920.51
Phelps	63,201	\$60,356.00	\$120,487.54	\$154,320.90	\$335,164.44
Pulaski	37,861	\$38,685.00	\$88,905.53	\$92,447.01	\$220,037.54
Reynolds	89,913	\$93,975.30	\$167,644.25	\$219,544.86	\$481,164.42
Ripley	97,357	\$90,154.00	\$179,757.89	\$237,721.23	\$507,633.12
Shannon	83,814	\$90,032.19	\$156,504.01	\$204,652.64	\$451,188.84
St Francois	673	\$699.00	\$1,514.21	\$1,643.30	\$3,856.51
Ste. Genevieve	10,254	\$11,264.90	\$19,252.05	\$25,037.68	\$55,554.63
Stone	9,625	\$12,882.18	\$28,986.23	\$23,501.82	\$65,370.23
Taney	61,801	\$67,220.19	\$120,163.07	\$150,902.45	\$338,285.71
Texas	47,287	\$51,862.56	\$91,068.68	\$115,462.92	\$258,394.17
Washington	82,133	\$79,067.00	\$154,340.86	\$200,548.06	\$433,955.92
Wayne	87,248	\$95,451.12	\$163,966.89	\$213,037.60	\$472,455.61
Wright	7,159	\$7,887.00	\$13,303.38	\$17,480.47	\$38,670.85
<b>State Total</b>	<b>1,473,679</b>	<b>\$1,658,520.12</b>	<b>\$2,767,211.62</b>	<b>\$3,598,352.32</b>	<b>\$8,024,084.06</b>

**Goal 2.2 – Prescribed Fire, Fuels, and Wildland Fire Management**

**Question – What level of wildland fire on the landscape is appropriate and desirable?**

In areas with a wildland fire use plan, the desire is to allow natural starts to burn under manageable objectives and conditions. MTNF will completely suppress fires in these areas if fire fighter safety, public safety, or structures are at risk.

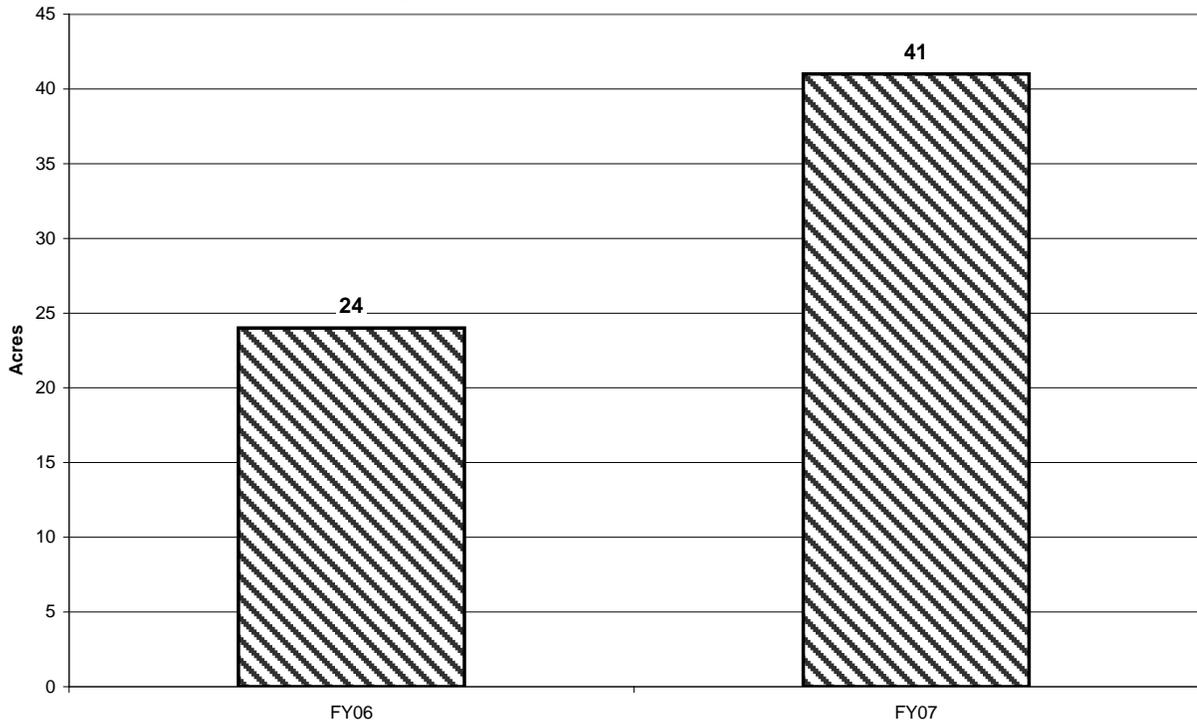
There was only one natural ignition fire recorded among the 151 wildfires that burned in FY 2007. In this case, the fire was small and did not meet management objectives cited in the Forest Plan. Over 80% of wildfires in FY 07 were caused by either arson (67%) or debris burning (17%). The following chart displays the number of fire occurrences by cause.



**Question – To what extent is unwanted wildland fire on the landscape suppressed, and at what size were wildfires contained?**

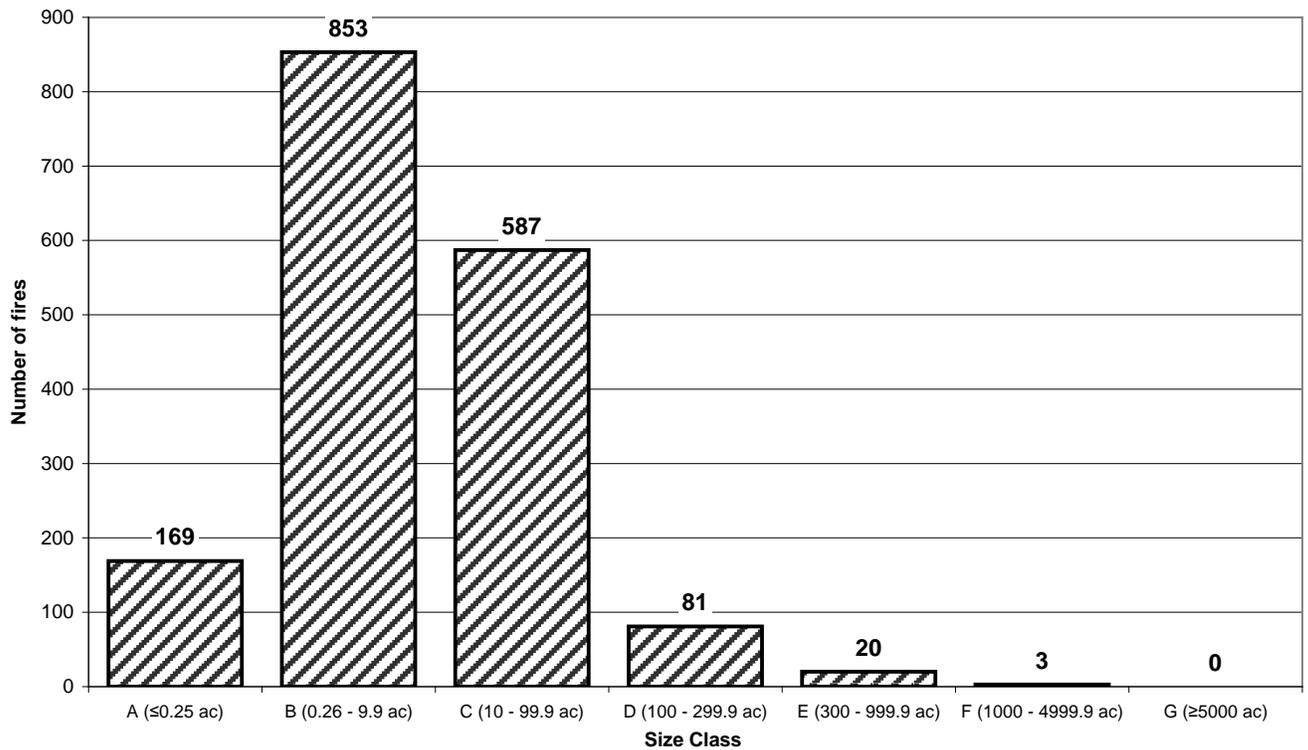
The unwanted wildland fire is suppressed completely when tactical decisions are precise and safety is not at risk. There were 151 wildland fires recorded with a total of 6,263 acres burned. The average size of these fires at containment was 41 acres, which is somewhat larger than in FY 06. The 2005 Forest Plan includes direction to “Use existing natural or manmade barriers...instead of constructed firelines for suppression activities when the value-at-risk is low and where practical and safe for firefighters and the public” (FP page 2-18.) Somewhat larger wildland fires are to be expected as the Forest adjusts its suppression activities to comply with this direction.

**Average Size of Wildland Fire at Containment**



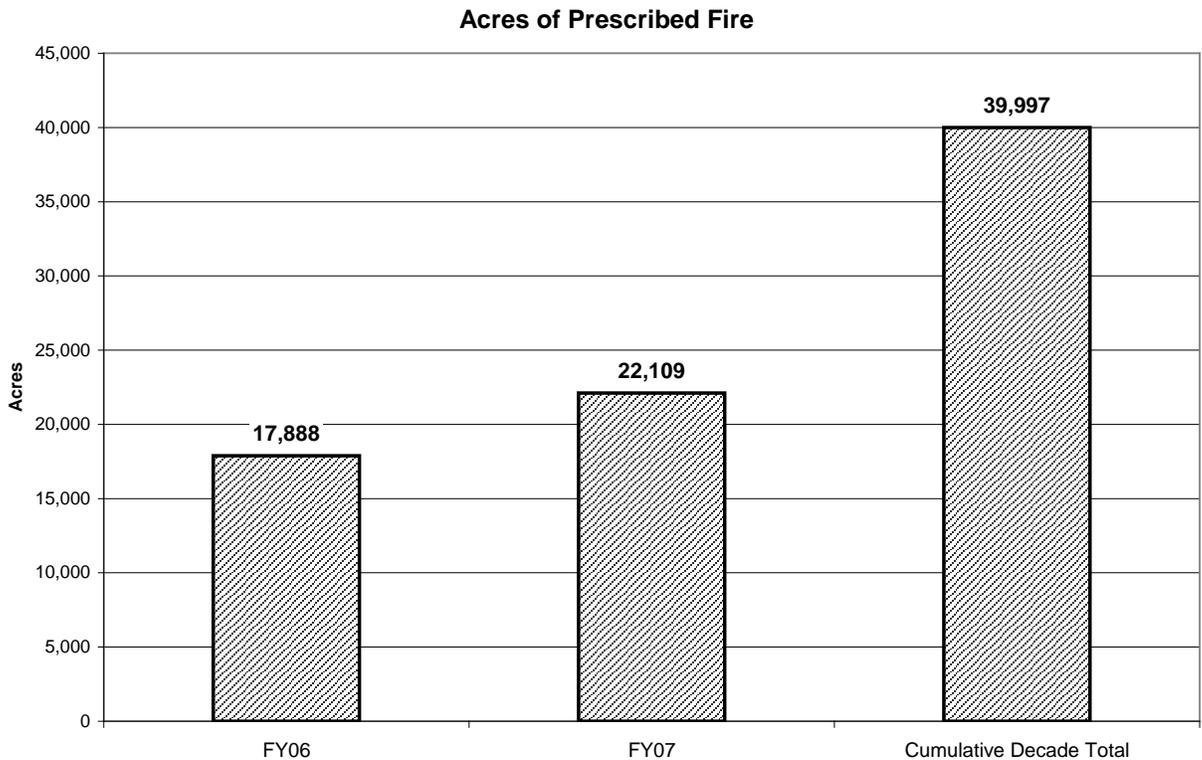
The following graph displays ten years of data on wildfire. Of the 1,713 wildfires that occurred during this period, 94% were contained at less than 100 acres (size classes A, B, C.)

**Number of Fires by Size Class  
1997 - 2007**



**Question – To what extent were prescribed fires used to mimic natural processes, maintain/improve vegetative conditions, and/or restore natural processes and functions to ecosystems?**

A total of 22,109 acres were treated with prescribed fire in FY 07 to restore the ecological role of fire. Prescribed fire was used on 14,820 acres of Management Prescription 1.1 and 1.2 areas (3% of total management prescription area) in order to restore historic natural conditions and improve ecosystems. On the larger prescribe burns, various firing techniques were used to emulate natural fire processes and meet burning objectives.



**Question – To what extent were prescribed fires used to treat fuel levels in high risk areas?**

and

**Question – How many acres of hazardous fuels reduction activities were accomplished within the Wildland-Urban Interface?**

The Mark Twain NF effort was to locate areas of high to moderate risk, around communities, and improve vegetative conditions in manageable areas. There were 22,109 acres treated in high to moderate risk areas identified in the 2005 Forest Plan Fire Risk Assessment. The forest reduced 15,616 acres of fuel within wildland urban interface and intermixed areas.

**Question – Are fuel treatments (mechanical and burning) effective?**

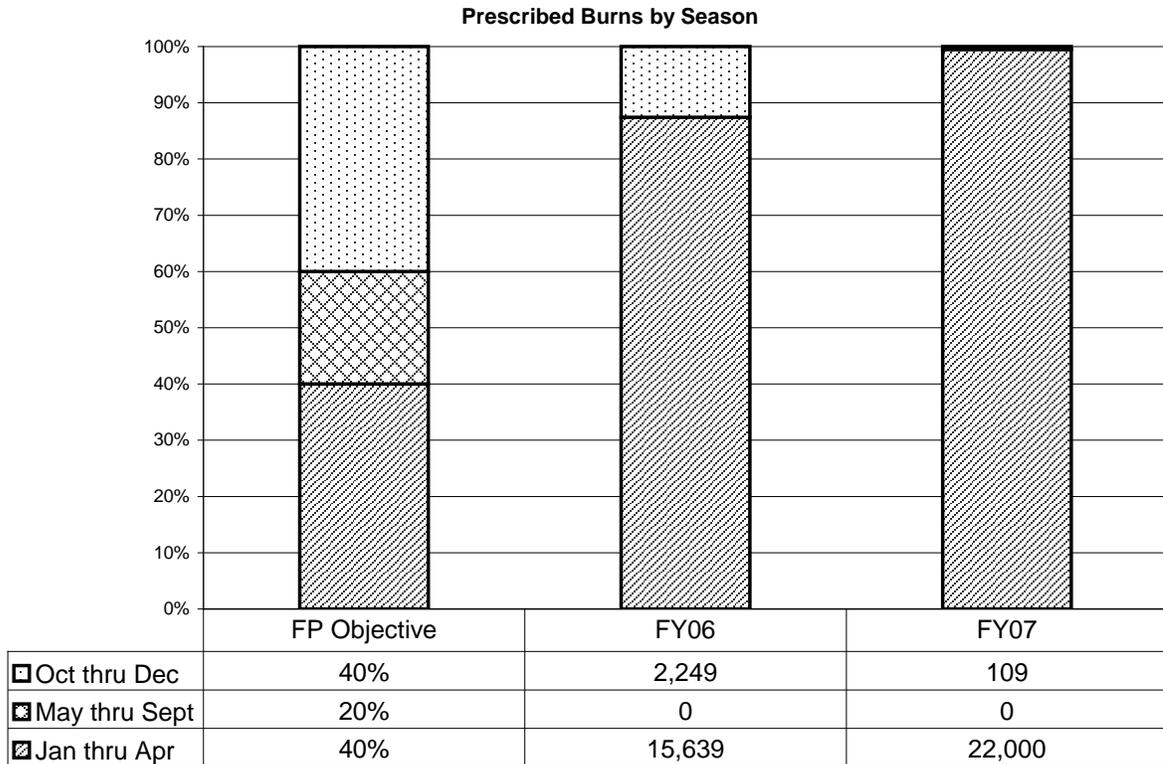
The effectiveness of fuel treatments should be addressed in the goal of the burn or treatment objectives. The fuel monitoring data was collected from plots located in 10% of areas that were burned and mechanically treated. These plots showed an overall decrease in fuel levels a year later. Reducing fuel loads creates less intense wildfires, less complex prescribed burns, and more improvement in biodiversity.

**Question – To what extent is the Forest management contributing or responding to air quality effects on ecosystems, human health, or human enjoyment?**

No sensitive areas were impacted by smoke or emissions, due to the preliminary analysis and emission reduction techniques employed by the Forest.

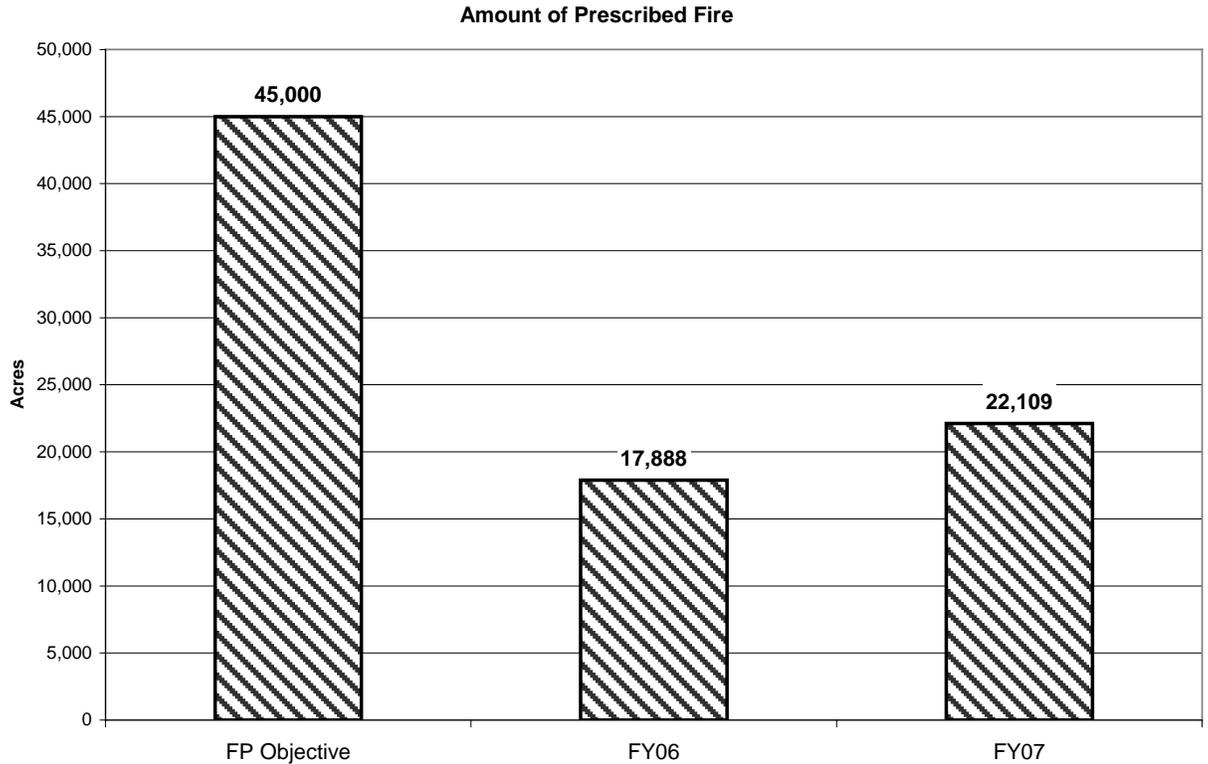
**Question – What progress has been made towards meeting Objectives described in Chapter 1 of the Forest Plan?**

*Objective 2.2a – Prescribe burn up to 20% of total projected burn acres from May through September, and prescribe burn up to 40% of total projected burn acres from October through December.*



Prescribed burns are designed to meet specific objectives described in the analysis and decision documents authorizing the burns. Under the 1986 Forest Plan, the objectives for prescribed fires were predominantly for timber, wildlife resources, and hazardous fuels reductions. Prescribed fires to meet these objectives are best conducted during the spring and fall seasons, and summer burns, which could damage young hardwoods, are avoided. Most of the prescribed fires conducted in FY06 and FY07 were authorized by decisions made under the 1986 Forest Plan, so have been conducted during the spring and fall. Under the 2005 Forest Plan, summer burns are needed to help meet restoration objectives. As more project decisions are made that include restoration objectives, it is expected that the Forest will begin to conduct more summer burns. The Forest is also working towards developing burn parameters and guidelines for use in implementing growing season burns.

*Objective 2.2b – Use prescribed fire to reduce hazardous fuels and improve Fire Regime Condition Class on 45,000 acres or more per year.*



**hGoal 2.3 – Transportation System**

**Question – What are the effects of off-road vehicle use on the physical environment?**

In August, 2007 the Ava RD documented some of the effects of OHV use on the Chadwick OHV trails with a series of before, during, and after photos of some of the areas where they performed trail maintenance. The Photo 1, shown to the right, shows how the trail has become deeply incised, creating an erosion problem and compromising rider safety on this "easy" trail.



**Photo 1 - Condition of trail prior to maintenance**



**Photo 3 - Dozer creating water diversion**

Photos 2 and 3 show how a small trail dozer being used to place gravel and create water diversion structures (water bars) to solve the problem. Photo 4 shows the finished product.



**Photo 2 - Dozer placing gravel**



**Photo 4 - Finished trail maintenance**

**Question – How effective are forest management practices managing OHV use?**

In FY2007 we analyzed the results of a survey of the recreationists that utilize the Chadwick Motorcycle and ATV area. This provides the forest with a better understanding of these recreationists, how they use the area, their opinions of the area, and what features are important to them.

In FY2007, a team of trails technicians rode the ATV/Motorcycle Trails within the Chadwick Motorcycle and ATV Area reported that the proliferation of unauthorized routes is rampant, causing resource damage, creating conflicts with adjacent land owners, confusing the riders,

and giving the appearance that the area is receiving little management. Many of the illegal/user-made trails and user opened trails have been closed or the entrances have been blocked, but some of these trails have been repeatedly reopened. These efforts have been especially ineffective on trails that involve hill-climbs or short-cuts. It appears that there is blatant disregard for routes that are signed closed.

LEOs conducted saturation patrols to provide additional enforcement in some of the areas with known violations, including at the Chadwick ATV and Motorcycle Area.

Total citations and warnings issued by Law Enforcement Officers and Forest Protection Officers for OHV violations were slightly higher in number compared to those issued in the past couple of years. According to the 2008 Law Enforcement Agenda for the Mark Twain National Forest, law enforcement personnel issued 90 violation notices, and 113 incident reports, for a total of 203 OHV violations during FY 2007.

Two of the top three offenses for which violation notices, warnings, or incident reports are generated on the MTNF relate to ATVs and other off-road vehicle use, and both of those were a little lower in 2007 than they were in 2006.

**Top MTNF Offenses over Four--Year Period**

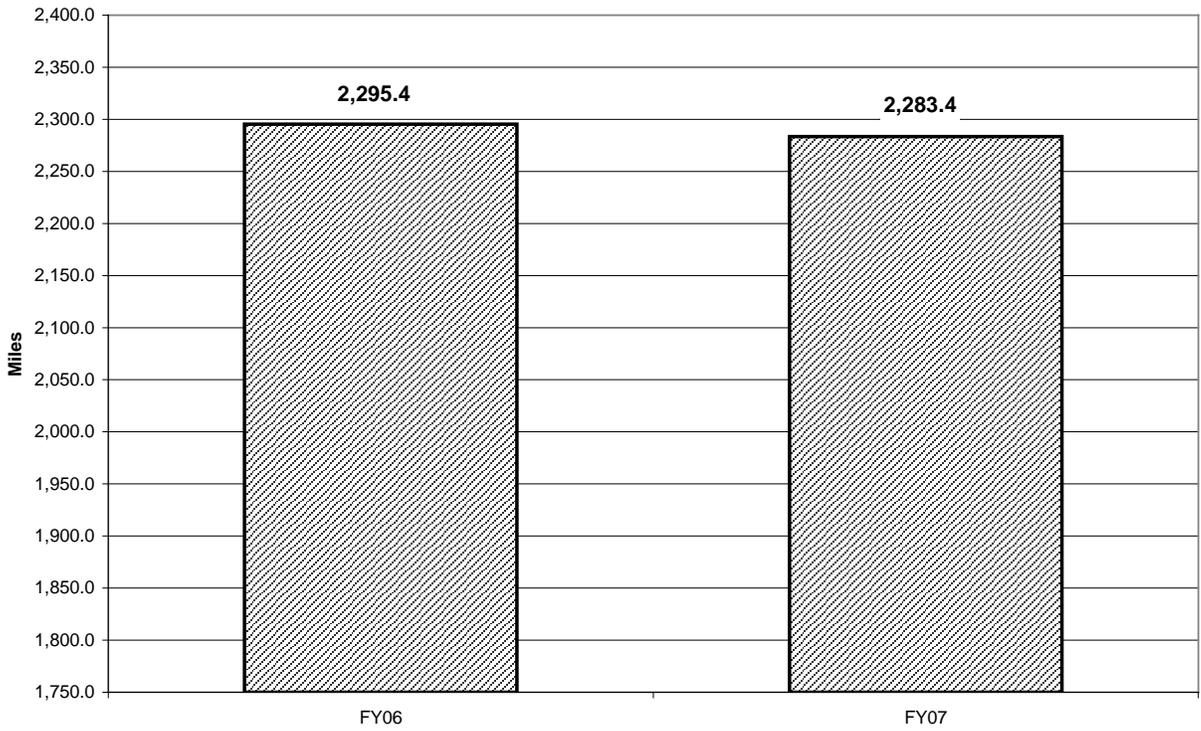
Code	Offense	2004	2005	2006	2007	Total
36 CFR 261.56	Vehicle Off Roads	199	182	157	135	673
36 CFR 261.54D	Limitation Violations	254	169	216	178	817

In 2007, the Forest produced Motor Vehicle Use Maps for Houston/Rolla, Cedar Creek, Ava, Cassville, and Willow Springs Ranger Districts, utilizing the new national protocol. These are single purpose maps developed to display the roads, trails and areas on the national forest where motorized use is allowed. The maps conform to a strict set of national standards, but lack some of the information needed for easy understanding, and to date have not been very useful to the public or to the forest.

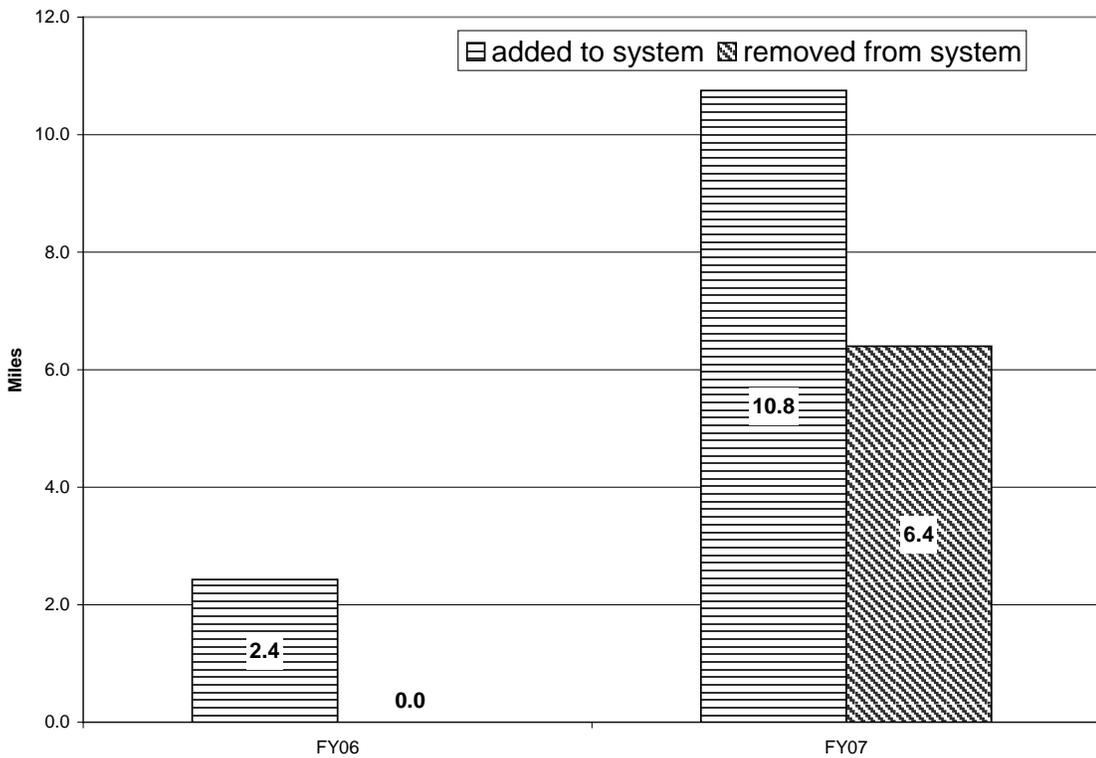
**Question – Is a minimum transportation system being provided and maintained to meet resource management objectives?**

As noted in the EIS for the 2005 Forest Plan, the transportation system for the Forest is largely in place. According to the FY06 Road Accomplishment Report, there were 2,295.35 miles of NFS roads at the end of the fiscal year. In theory, the ending FY06 mileage and beginning FY07 mileage should be the same. However, during FY07, the forest transportation planner retroactively entered road NEPA decisions into INFRA that had occurred in past recent years, and this resulted in changes to the starting mileage for FY07. In addition, road mileage errors were corrected, to correlate with their actual length on the ground. These changes were reflected in the FY07 Road Accomplishment Report. For FY07, the Forest started the year with 2309.6 miles of system road and ended with 2283.4 miles of system road.

Total Miles of System Roads



During the course of the fiscal year, through NEPA road decisions, 10.75 miles were added to and 6.4 miles removed from the transportation system. Of the 6.4 miles to be removed, 6.3 miles will be decommissioned and 0.1 mile will be converted to a non-motorized trail.



The monitoring report for Rams Horn/Crescent II/Southard Projects Areas (8/7/2007) identified the need for better coordination during NEPA between engineers, ID team members, and timber staff in identifying both short and long-term access needs and road maintenance levels for proposed timber sale activities. The value of timber products to be removed should also be considered.

Maintenance was performed on 810 miles (35%) of system roads, which closely correlates to the total system road miles meeting their stated Objective Maintenance Level (ObML). Road improvement (reconstruction) was accomplished on 17.1 miles of ObML 2 system roads. Of these improvements, 2.8 miles were done utilizing TRTR funds and 14.3 miles were completed by timber purchasers. (FY07 Road Accomplishment Report)

**Question – How many miles of road have been decommissioned?**

During FY 2007, a total of 122 miles of road (115.7 miles non-system and 6.3 miles system road) were identified for decommissioning in various NEPA decisions. During the fiscal year, 2.3 miles of system road were physically decommissioned (FY07 Road Accomplishment Report) to prevent use by motorized vehicles. In addition, non-system roads were also physically decommissioned, but the forest was unable to gather this information for the FY07 accomplishment report.

Roads are typically decommissioned when other work is performed in their vicinity, in particular vegetation management activities. Roads decommissioned under the supervision of the engineering staff are more likely to be reported in INFRA. However, roads that are decommissioned congruent with timber sale activities aren't recorded in any tabular database by timber staff. The forest needs to develop a better method for tracking and reporting road decommissioning on the forest.

**Question – Are unneeded roads being decommissioned in an effective manner?**

A large number of roads identified for decommissioning will be used for temporary access into timber sale areas. Upon completion of the timber sale or as cutting units are closed, the timber purchaser will decommission temporary roads.

Other roads identified for decommissioning may be closed by a contractor, paid by forest funds. A small percentage may also be decommissioned with forest personnel and equipment. Where there is no planned vegetation activities, roads would most likely not be decommissioned. Some may become grown-up with vegetation, provided motorized vehicles remain off the road.

The Decker Fire Rehabilitation Team recommendations (April 2007) found that fire lines, which utilize unneeded roads as fire breaks, should have water bars installed to ensure water can drain from roads that are entrenched. In additions, debris and downed trees placed within the road could discourage motorized use (in particular ATVs).

The forest published 6 motor vehicle use maps (MVUMs) during FY07, for the following units: Ava, Cassville, Cedar Creek, Eleven Point, Houston-Rolla, and Willow Springs. The MVUMs depict which system roads are open to public motorized access and any with seasonal restrictions. The map also serves as a law enforcement tool. Roads not depicted on the MVUM, such as non-system roads, are closed to public motorized use. It is hoped that through a combination of getting such information to the public and effective law enforcement, illegal motorized use of non-system roads will decrease and will allow such roads to re-vegetate and help with decommissioning efforts.

## Goal 2.4 – Timber Management

### **Question – Are harvested lands adequately restocked after five years?**

First and third year stocking surveys were conducted on a total of 4,301 acres of natural regeneration sites, and 1,992 acres were certified as adequately restocked. The remaining acres will be certified within the next few years.

First year stocking surveys were conducted on 666 acres planted in 2006, and third year survival surveys were conducted on 603 acres planted in 2004. The survival rate of the planted shortleaf pine seedlings was uncharacteristically low (70% in 2006 and 63% in 2004.) The low survival rate was due primarily to intense competition from hardwood advance regeneration. The objective of most of the planting was to increase the percentage of pine in areas devastated by a tornado. That objective was met and the areas planted in 2004 were certified as fully stocked.

### **Question – Are insect and disease populations compatible with objectives for restoring or maintaining healthy forest conditions?**

The Forest continues to experience widespread oak decline. In FY2007, 3,281 acres were salvaged in response to oak decline. No other significant insect or disease problems have been identified.

## Goal 2.5 – Geology and Minerals Management

### **Question – Are mineral exploration, development, and production stipulations effective and being followed as recommended in project designs?**

Field inspections (pre and post mineral operations) and IDT field reviews were used to validate that stipulations, notifications, and conditions of approval, surface use plans, and management plans were followed.

A total of 41 development/exploration drill sites were monitored during FY2007. Of the 41 sites, 32 sites were drilled in FY 2007 with nine of these rehabbed. Nine sites had been previously drilled in FY 2006 and rehabbed in FY 2007. All 41 sites were found to be in accordance with the lease or permit stipulations, and applicable Forest Plan standards and guidelines.

## Goal 2.6 – Land Adjustment Program

### **Question – How successful is the Forest's land adjustment program in support and enhancement of Forest Plan desired conditions and objectives and contributing to efficient and effective stewardship?**

During FY 2007, the MTNF completed 5 Land for Timber Exchanges adding 398 acres of forest land for a cost of \$388,000. The MTNF also acquired 75.50 acres adjacent to Paddy Creek wilderness, using wilderness and in holding funds of \$92,000. One donation of 143 acres for \$143,000 was processed. These transactions increased the forest holdings by 616.5 acres. Two Land for Land exchanges were completed in which 320 acres were exchanged for a federal value of \$260,000.

All of these actions were in compliance with the goals and direction of the approved 2005 Forest Plan for the Mark Twain National Forest and the National Strategic Plan for the Forest Service 2007 -2012. Each separate action was reviewed by both the Regional Office and the OGC for compliance and the written documentation of specific areas of compliance for each transaction is a part of the permanent case file. In all cases, lands acquired were adjacent to existing National Forest land resulting in consolidation of national forest lands and reduction

of corners and or property boundary lines. In general these acquisitions protected watersheds, improved recreation opportunities, provided improved public access, enhanced wildlife habitat, increased protection for endangered species, reduced impacts from invasive species, and improved the administration of national forest lands and facilities.

In addition to the lands acquisition and exchanges, the MTNF also installed approximately 350 corner monuments, marked 41.5 miles of National Forest Boundary, solved 11 encroachments, obtained 10 temporary rights-of-way for timber harvest activities, removed 80 buildings, brought the ALPS data layer up to date, and coordinated with Fort Leonard Wood and the Corps of Engineers on potential land exchanges.

## Goal 2.8 – Recreation Opportunities

### **Question – To what extent do Forest recreation facilities and opportunities meet accessibility, health, safety, cost, and maintenance requirements and achieve resource and social objectives?**

District personnel conducted pre-season Developed Recreation Facility inspections at all developed recreation sites. After removal of identified hazard trees and other site preparation procedures, all sites were determined to meet at least all of the critical performance standards, which include health and safety standards.

We continued to implement the Facility Master Plan, with the following actions taken in FY 2007 to move the Forest closer to our goal of balancing our recreation facility needs with available resources:

- Established volunteer agreement for management of the following developed recreation sites: Marble Creek Recreation Area, Paddy Creek Recreation Area, Falling Spring Recreation Area
- Some or all of the facilities were removed from the following sites because we can no longer afford to operate and maintain them to standard: Brazil Creek, Little Scotia, Cook Spring toilets, tables and grills
- Purchased and installed a few accessible tables, grills and other features at existing sites
- Completion of improvements previously initiated at Bar-K, Carrington Pits, Pine Ridge & Paddy Creek, Deer Leap, Hercules Tower, Markham Springs, Loggers Lake, and Sutton Bluff Toilet Installations: accessible walkways

A permit was issued for concession operation of the Float Camp and Deer Leap Recreation Areas. We worked with interested parties to discuss volunteer help or other management assistance for other developed recreation areas.

The Forest analyzed developed recreation sites through a process called "Recreation Facility Analysis" in the fall of 2007. Recreation Facility Analysis is the first nationally consistent analytical process that includes recreation site operation and maintenance costs, relative importance of each site (considering how well it supports the forest's recreation niche as well as the use the site receives), and its condition, similar to the process used on the MTNF in 2005 to develop the Facilities Master Plan.

Using this analysis, the Forest built a "5-year Program of Work" (POW), a list of tasks that the Forest will try to accomplish or further explore over the next 5 years to balance recreation facilities operation and maintenance needs with reduced staffing and financial resources, and address deferred maintenance backlog. Visitor satisfaction is the bottom line in this analysis. Implementing the results of the Recreation Facility Analysis will result in higher quality and

more efficiently managed recreation sites. The recreation facilities will support the forest's identified recreation niche, meet the needs, desires, and expectations of the majority of our constituents and visitors, and be operated and maintained within the funding and resources available to the Mark Twain National Forest.

**Question – Does water in Forest-provided drinking water sources and swimming beaches meet standards of quality protective of human health and aesthetics?**

Public drinking water sources on the Forest are monitored in accordance with State law during the recreation season. In most instances, water samples meet State criteria. In the rare cases when problems surface, the Forest works closely with the State to rectify those problems.

**Question – To what extent are Forest management activities in semi-primitive management areas within the Recreation Opportunity Spectrum Objectives (ROS)?**

This question is to be answered by reviewing projects with management prescriptions managed for semi-primitive ROS objectives (1.2, 6.1, 6.2, and scenic portions of 6.3.) Several of the monitoring field trip reports for FY 2007 addressed this question, stating that the projects had met the required ROS objectives.

**Goal 2.10 – Heritage Resources**

**Question – Are avoidance or mitigation measures effective and being followed as recommended in project designs?**

The zone archeologists and archeology technicians insure that known archeology sites are identified on maps used by the marking crew, sites are flagged on the ground, and boundaries are painted. The timber sale administrator insures that the archeology sites are protected from disturbance by the timber harvesting operations. The zone archeologists insure surveys of temporary roads and skid trails prior to their use.

Post burn monitoring of archeology sites occurs after prescribed burns. Monitoring is documented by zone archeologists and reported to SHPO.

**Question – Are heritage resources being affected in non-project areas?**

Dispersed recreation, such as off-trail ATV use, cave looting, and large deer camps at old house places or in riparian areas, can cause damage to archeology sites. LEO's and other forest staff document the damage and action is taken where evidence is available.

Historic administrative sites and historic recreation areas are maintained in consultation with the State Historic Preservation Officer (SHPO).

**Goal 2.11 – Wilderness Opportunities**

**Question – Are air quality related values of the Class I air sheds being maintained? (Hercules Wilderness)**

The Forest continues to fund the nationwide air monitoring program activities at Hercules Glades Wilderness. The Forest uses data products developed by the Interagency Monitoring of Protected Visual Environments (IMPROVE) group. Application of the new IMPROVE Algorithm to natural visibility estimates is currently under review by the RPO monitoring and data analysis work group. The most recent data available to the Forest is from 2004.

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## List of Preparers

The Mark Twain Forest Monitoring Team, led by Laura Watts, prepared this Annual Monitoring and Evaluation Report. While many individuals were involved in monitoring activities, the following staff directly contributed the details and expertise necessary for this report.

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