Summary

Final Environmental Impact Statement

Mark Twain
National Forest

Cover photo: Shortleaf pine woodland, USDA Forest Service

Photographer: Paul Nelson

Summary

Final Environmental Impact Statement

Introduction

This Summary provides an overview of the Final Environmental Impact Statement (FEIS) for revision of the Mark Twain National Forests' Land and Resource Management Plan (Forest Plan).

Two major sources of direction for this effort are the National Forest Management Act and the National Environmental Policy Act. Both provide guidance on the process of revision and the content for analysis. The National Forest Management Act requires an interdisciplinary approach to assure coordination of multiple-uses including outdoor recreation, range, timber, watershed, wildlife and fish, wilderness, sustained yield of products and services. The National Environmental Policy Act requires a systematic decision-making process with public involvement, issue identification, development of alternatives to address issues, and analysis of environmental impacts of alternatives.

The Mark Twain NF Forest Plan has been revised under the planning rule that was adopted in 1982. Generally, Forest Plans are to be revised every 10 to 15 years to address changed conditions and new information. The current Forest Plan for the Mark Twain National Forest was implemented in 1986.

The FEIS states the purpose and need for Plan Revision, discloses a description of the issues to be addressed, the alternatives being considered to respond to the issues, and an analysis of potential environmental effects of each alternative. The FEIS also identifies Alternative 3, with changes, as the Selected Alternative.

The companion document to the FEIS is the 2005 Forest Land and Resource Management Plan (2005 Forest Plan). Forest Plans guide all natural resource management activities and establish management goals and objectives, allocation of lands to different management emphases, and standards and guidelines for Plan implementation. Based on the Selected Alternative, the 2005 Forest Plan describes desired conditions, assigns measurable objectives, provides specific standards and guidelines as to how to achieve the desired conditions, and outlines a program for monitoring and evaluating results of implementation.

The FEIS is divided into the following five chapters:

- Chapter One (Purpose, Need, and Forest Plan Revision Issues) describes the reasons for revising the Forest Plan;
- Chapter Two (Alternatives) describes and compares alternatives for meeting revision goals on the Mark Twain National Forest. The alternatives display a reasonable range of responses to the 8 Forest Plan revision issues described in this chapter;
- Chapter Three describes the Forest's and surrounding area's physical, biological, and social environments and the effects of the alternatives on these environments;
- Chapter Four lists those who participated in preparing the FEIS; and

- Chapter Five lists distribution of FEIS copies to federal, state and local agencies, tribal governments, organizations, businesses, and individuals.

Forest Profile

The Mark Twain National Forest administers approximately 1,485,800 acres in southern Missouri. This constitutes approximately 10% of the forested land and 84% of the publicly owned forested land in Missouri (Resource Bulletin NC-139).

The Forest is composed of nine separate geographic units in 29 counties which span the state 200 miles east to west and 175 miles north to south. Private land parcels are scattered throughout the Forest boundaries. On average, Federal ownership within the boundaries of the National Forest is about 49%, and ranges from a low of 24% at Cedar Creek unit to a high of 71% at Doniphan/Eleven Point unit.

Social and Economic Condition

The relationship between the Mark Twain National Forest and local lifestyles and economies is interdependent and complex. Outdoor recreation, seven Wilderness areas, an exceptional wild and scenic river, and unique ecosystems all provide a stunning backdrop to communities that are growing at a fast pace.

Population and Demographics

Population has grown rapidly in recent decades within the 29 counties with National Forest land. Recent population growth seems to be more strongly associated with counties near metropolitan areas. Overall, the population of the Mark Twain NF area grew an average of 19% from 1990 to 2000. However, the counties that make up the analysis area continue to be the least densely populated areas of the state.

Income and Poverty

For 2001, Missouri's per capita personal income was $28,226, which places it 30th out of 50 states. Per capita income for areas in and near the Forest ranges from a low of $16,009 in Doniphan-Eleven Point area to a high of $23,802 in Cedar Creek. The average Mark Twain NF per capita income is almost $9,000 less than the state average.

The poverty rate is a commonly used indicator of the level of economic need in a community. The Economic Research Service classifies 15 non-metropolitan counties in the Forest area as having "persistent poverty" (high rates of poverty in 1960, 1970, 1980, and 1990). Nearly half of the 26 non-metropolitan counties that contain national forest lands are persistent poverty counties.

Physical and Biological Setting

The Mark Twain lies mostly within the Ozark Highlands, a region long distinguished for its extraordinary geological, hydrological and ecological diversity. Signature features include crystal-clear springs, over 5,000 caves, rocky barren glades, ancient volcanic mountains and nationally recognized streams. The Ozarks have been continuously available for plant and animal life since the late Paleozoic period, constituting perhaps the oldest continuously exposed landmass in North America (Yatskievych 1999).

In the Ozarks, eastern oak hardwood and southern pine woodlands converge with the drier western tallgrass prairie, creating a distinctive array of open grassy woodlands and savannas. This rich mixture of unique, diverse and ecologically complex natural communities provides a high level of habitat diversity. The high level of habitat diversity, influx of biota from

divergent regions through thousands of years of climatic events, effects of past glaciation to the north, and extreme antiquity of the landscape have combined to support relict populations and allow for development of at least 160 endemic species.

The Mark Twain National Forest occurs in five of the seven major river basins in the Missouri portion of the Ozark Highlands. Eleven primary streams and rivers course through these basins, portions of which occur within the Mark Twain. Because of the region's karst topography, the Ozarks are home to the world's largest collection of first magnitude springs (those with over 65 million gallons of water flow daily.)

Summary of Final Environmental Impact Statement (FEIS)

Proposed Action

The Forest Service proposes to revise the 1986 Land and Resource Management Plan (1986 Forest Plan) for the Mark Twain National Forest. The revised Forest Plan would be used to guide all natural resource management activities on the Forest to meet the objectives of federal law, regulations, and policy.

Purpose and Need for Forest Plan Revision

The development of the revised Forest Plan and the accompanying environmental impact statement is intended to satisfy regulatory requirements and to address new and changing information about the Forest and its uses.

The National Forest Management Act requires that national forests revise forest plans at least every 15 years (U.S.C. 1604[f][5]). Additional indicators of the need to revise the 1986 Mark Twain Forest Plan are:

- Land conditions and public demands have changed;
- Agency policies and strategic priorities have changed;
- Results of monitoring and evaluation suggest the need for revision;
- New information is available; and
- Those interested in management of the Mark Twain National Forest have made suggestions for changes.

In April 2002, the Forest Supervisor and Regional Forester identified forest plan revision needs in the Assessment of the Need for Change for the Mark Twain National Forest Land and Resource Management Plan. The Assessment discusses the process and information used to develop proposed changes to the Forest Plan.

Revision Topics

The Notice of Intent to Revise the Forest Plan, published in the Federal Register in April 2002, described the revision topics identified by the Assessment of the Need for Change. The revision topics are the focus of this forest plan revision process. They address the central issues and public concerns to which future management of the Mark Twain National Forest must respond. The 2005 Forest Plan and the alternatives were developed to answer questions raised by these revision topics. The revision topics are listed below. They are discussed in more detail in Chapter 1 of the FEIS.

Revision Topic 1 – Vegetation and Timber Management

- Revisit suitable lands determination, revise demand estimations, and rebuild the Allowable Sale Quantity (ASQ) determination based on those changes.
- Provide for adaptive management and greater flexibility of silvicultural techniques in order to maintain oak-hickory, shortleaf pine and oak-pine communities.

Revision Topic 2 – Ecological Sustainability and Ecosystem Health

- Develop management direction for restoring and maintaining healthy forest ecosystems in response to oak decline; providing a healthier balance of shortleaf pine and white oak in what is now a predominantly black and red oak forest; and restoring some of the more open woodland habitats encountered by early settlers.
- Change management direction to allow pine and oak reforestation and stand improvement in a wider variety of situations, so as to encourage natural vegetation most suited to Missouri's natural communities.
- Provide a wide diversity of natural communities and wildlife habitat conditions based on differing landscape capabilities and advanced ecological knowledge.
- Revise list of Management Indicator Species.

Revision Topic 3 – Fire Management

- Develop management direction guiding the use prescribed fire to restore ecosystems, maintain healthy forests, provide wildlife habitat, and reduce hazardous fuels.
- Improve management direction for managing wildland fires to protect life, property, and communities.
- Develop a proactive approach to fire and fuels management so as to improve and maintain forest health and reduce the intensity of wildland fires.

Revision Topic 4 – Management Areas

- Adjust management area boundaries as needed to incorporate ecological landtypes, current social demands, and management practicalities.
- Review management direction to insure protection of Roadless, wilderness, wild, and scenic river values, and other "special areas."
- Evaluate inventoried roadless areas for their potential for Wilderness designation. Determine the most appropriate use and management for inventoried roadless areas not recommended to Congress for Wilderness designation.
- Determine eligibility and highest potential classification for any rivers identified with potential for inclusion in the Nation's wild and scenic river system.

Revision Topic 5 – Riparian Areas and Water Quality

- Provide for the restoration and maintenance of the ecological function of riparian areas, emphasizing the ecological processes that riparian areas play in supporting aquatic systems and water quality.
- Develop clearer definitions and criteria for delineating riparian areas and aquatic ecosystems, based on plant community, soil and hydrologic criteria.
- Develop management direction to protect water quality and ecological processes associated with karst terrain and karst features.

Revision Topic 6 – Threatened, Endangered, and Sensitive Species Viability

- Examine and revise management direction to protect and provide for threatened, endangered and sensitive species.

Revision Topic 7 – Access and Transportation Management

- Clarify, modify, or eliminate road density standards
- Eliminate the Forest Plan Transportation map, and clarify that changes to the road system are project level decisions.
- Clearly state the existing Forest direction for OHV and ATV use of "closed unless posted open." Clarify the relationship among the Forest Plan direction, State law, and the Forest Supervisor's closure order.

Revision Topic 8 – Monitoring and Evaluation

- Revise and improve the strategy for monitoring and evaluation to reflect ecosystem management and ecological sustainability concepts and approaches.
- Focus the monitoring strategy on information that will (1) enhance understanding of resource management issues; (2) is measurable and scientifically supported; and (3) is feasible given probable budgets.

Forest Plan Revision Issues

An issue is a point of debate, dispute, or disagreement regarding anticipated effects of implementing the proposed action. When making programmatic decisions, such as in this Forest Plan revision, issues often are framed as trade-offs between various desired conditions, amounts of products produced, or emphasis in management. For example, providing a diversity of natural communities and wildlife habitat conditions may involve tradeoffs with suitable lands determinations and ASQ. Issues stem from the topics summarized in the "Need for Change in Management Direction" section, and suggest alternative ways of responding to those topics. Public involvement, internal discussion, and analysis were used to identify the issues pertinent to Plan revision.

Response to the need for change (revision topics) and issues is tracked throughout the document by indicators that measure existing conditions and potential effects of management activities. These indicators focus our analysis and demonstrate differences between alternatives. The issues are summarized below. See Chapter 1 for a more complete discussion.

Issue 1 –Timber supply

There is disagreement about how much timber the Mark Twain National Forest can supply without adversely affecting ecosystem health, water quality, and the social and economic needs of people. Forest Plan revision will establish the acreage and location of land that is suitable for timber production. Revision will also determine the maximum level of timber that the Mark Twain NF may supply over time. The key indicators are:

- Average Annual Allowable Sale Quantity (ASQ)

Issue 2 – Ecological Sustainability and Ecosystem Health

There is concern about the effects on local timber markets from increasing the amount of white oak and shortleaf pine to provide for a healthy forest, and providing land dedicated to enhancement and restoration of natural communities. There is also debate about the effects on

the forest health from passive management, and from current direction restricting certain silvicultural methods and prescriptions.

Forest Plan revision will establish what, if any, direction for increasing white oak and shortleaf pine will be provided, and how much of the Forest will be allocated to natural community restoration. The Forest Plan revision will also determine what, if any, management direction regarding timber management techniques and practices is needed to provide for forest health. The key indicators are:

- Acres of ground cover meeting desired condition for savanna, woodland and glade
- Acres treated to move towards natural community type
- Acres burned
- Acres thinned

Issue 3 – Wildlife habitat management

There is divergent views about how the Forest should be managed for the full array of wildlife species and habitats, whether rare or common, and what habitats and species should be emphasized. Forest Plan revision will establish goals for the types, amounts, distribution, spatial pattern, and function of wildlife habitats. The key indicators are:

- Acres of natural community savanna, woodland and forest meeting desired condition for old growth natural communities.
- Management Indicator Community trends

Issue 4 – Fire Management

While prescribed fire is needed to reduce hazardous fuels and restore ecosystems, there is concern that increasing the use of prescribed fire will harm forest ecosystems and air quality. Forest Plan revision will determine how, where, and to what extent prescribed fire may be used to mimic natural processes and to restore natural processes and functions to ecosystems, and to reduce fuels. The key indicators are:

- Acres treated to progress toward FRCC 1
- Acres burned to reduce fuels and restore ecosystems

Issue 5 – Economic Sustainability of Local Communities

Forest Plan decisions contribute to economic sustainability by providing for a range of uses, values, products and services. At the same time, Forest plan direction must be consistent with ecological sustainability. Forest Plan revision will determine the mix of uses, values, products, and services that the Mark Twain NF could provide over time. The key indicators are:

- Income and Employment (by Resource Program)
- Income and Employment (by major Industry and Sector)
- Payments to Counties

Resources with No Change in Management Direction

There was no change in management direction for several resource areas under any of the alternatives considered in detail in this FEIS. The 2005 Forest Plan continues the management direction from the 1986 Forest Plan for these resource areas. These resource

areas and the reasons for not changing them are summarized in the Assessment of the Need for Change and Notice of Intent that was released in 2002 and in Appendix A – Public Involvement.

Of these issues, the most prominent are:

- Off-road vehicle use
- Minerals management
- Management of candidate Wild & Scenic Rivers
- Management of heritage resources, recreation, fish and aquatic resources

These topics and issues were not addressed in the formulation of alternatives, although they are discussed in the environmental analysis. In general, these topics are either not ripe for decision, have been addressed by recent (and still relevant) decisions, potential alternatives would cause unreasonable environmental harm, or adverse effects are easily limited under any alternative.

Alternative Development

As required by NEPA regulations, alternatives have been developed using an interdisciplinary process. Each alternative has been designed to respond to comments and revision topics in a different way, providing a range of possible management approaches from which to choose. Five alternatives were developed and considered in detail, each with a specific theme and set of management prescription allocations designed to match the theme. Five additional alternatives were considered but were determined to be inappropriate for further analysis. Both groups of alternatives contribute to the NEPA requirement that a reasonable range of alternatives be considered.

Changes between the Draft and Final Environmental Impact Statements

The Forest Service received 1,807 individual responses (including letters, emails, and faxes) on the DEIS and draft Revised Forest Plan. These comments, shifts in agency direction, and correction of errors led to several changes in the draft Revised Forest Plan. The changes range from minor edits and clarifications to changes in the standards and guidelines and monitoring requirements. The following summary describes the changes to standards, guidelines and other areas of the 2005 Forest Plan.

Public comments and Agency review also identified the need for several improvements to the analysis and presentation of materials in the FEIS. As a result, editorial discrepancies, minor inconsistencies, or gaps in the presentation of information in the DEIS have been corrected for the FEIS. These changes are noted in the response to comments.

We received a great deal of public and internal comments on our Draft Environmental Impact Statement (DEIS) and the Draft Revised Plan. Based on the many comments received, I have made several changes to the Draft Revised Forest Plan.

The changes range from minor edits and clarifications to changes in the standards and guidelines and monitoring requirements. The following summary describes the changes to standards, guidelines, and other areas of the Draft Revised Forest Plan.

Management Prescription 1.1 and 1.2

- Changed standards to allow for the construction of wildlife ponds if a long-term species viability concern is demonstrated and that concern cannot be addressed in another location.

- Added direction to clarify that the full range of variable conditions, from regeneration openings to areas exhibiting old growth characteristics, should be provided.

Management Prescription 2.1

- Removed a standard regarding distribution of activities in MP 2.1.

Threatened and Endangered Species

- Added requirements to survey for the presence of mussels prior to in-stream work, and to modify projects if presence confirmed.
- Added standard to prohibit vehicle or equipment use in fens, unless needed to improve Hine's emerald dragonfly habitat.
- Modified direction for Indiana bat maternity colonies. One change provides additional foraging habitat by strengthening designation criteria of maternity colony area and by specifying activities that are restricted within maternity colonies. A second change increases protection of roost trees by timing and activity restrictions around occupied roost trees.
- Added monitoring requirements for existing bat gates on caves.
- Added restrictions on prescribed burn timing near Indiana bat maternity colonies and near caves during swarming / dispersal periods.
- Prohibited core drilling in the 150-acre area designated as old growth around gray or Indiana bat caves.

Wildlife Habitat

- Revised Table 2-2 regarding stocking of trout.
- Moved direction regarding the provision for old growth and regeneration openings in MP 2.1, 6.1 and 6.2 from standards and guidelines to goals and objectives.
- Lowered the percentage of the areas that are desired as regeneration openings in management prescription 2.1 (from 11-20% to 8-15%) and 6.2 (from 3-5% to 1-5%).

Lower Rock Creek Area

- Added a standard prohibiting motorized use in most of Lower Rock Creek.

Temporary Openings

- Changed the definition of a temporary opening created by even-age timber management to specify that the stand remains an opening until the vegetation is 15 feet high (was 10 feet.)

Monitoring and Evaluation

- Changed monitoring requirements for Management Indicator Species (MIS) to focus on the effects of management activities on habitat, rather than on species population.

Editorial Corrections

- Editorial changes were made to correct misspellings, formatting, or to clarify management direction. These corrections did not change the basic intent of that direction.

Alternatives Considered in Detail

Alternatives have many things in common, sharing essential goals, concepts, and policies that all national forests are directed to follow. How they differ from one to another is in the relative emphasis given to particular issues and concerns, which is reflected in management prescription allocations for each alternative.

Alternatives 1 through 4 share forest-wide direction as established in the draft Revised Forest Plan, but do vary by acreage allocated to each management prescription. Alternative 5 is the 1986 Forest Plan, as amended (No Action alternative.) Alternative 3 is identified as the selected alternative for implementing the 2005 Forest Plan.

The five alternatives considered in detail are summarized below. A more complete description can be found in Chapter 2.

Alternative 1

This alternative was designed to respond to those who want to see passive restoration principles implemented, less active management of forest resources, semi-primitive recreation emphasized over timber production, and commercial activities reduced or eliminated.

Emphasis is on minimizing direct human influence. No commercial timber harvest would be allowed. Characteristics of the forest environment, such as vegetation structure and species, would be affected primarily by natural disturbance factors such as insects, disease, fire, and weather events. As a result, wildlife habitat would focus on mature forest, with fewer and smaller areas of early successional habitat. Existing developed recreation areas would remain, but other recreation opportunities would emphasize dispersed recreation like backpacking, hunting, and floating in a semi-primitive, motorized environment. Management is focused on visitor safety, law enforcement, and other custodial elements.

Alternative 2

This alternative was designed in response to those who want Forest management to emphasize maintaining composition, structure and dynamics of native forest ecosystems; aggressively restoring native terrestrial communities, such as glades, savannas, and shortleaf pine forests; and focus on restoration of ecosystems on large regional scales. This alternative provides emphasis and direction to encourage biodiversity and restore sustainable native ecosystems over timber sustainability.

Emphasis is on restoration of underrepresented terrestrial natural communities, while providing forest products and other multiple use benefits. Management activities, such as timber harvest and prescribed fire, would be used to influence ecological processes to attain and sustain a high diversity of habitats and species. A wide range of wildlife habitat is provided by restoring and enhancing terrestrial natural communities, and emulating their historical distribution patterns. A broad range of settings for a variety of recreational opportunities are provided, including both developed recreation sites and areas for dispersed recreation like backpacking, hunting, floating, and off-road vehicle use.

Alternative 3

This alternative was designed in response to those who want to see a balance between restoration of natural communities and production of traditional forest commodities.

Emphasis is on improvement of forest health conditions, production of forest products and other multiple use benefits, and enhancement of terrestrial natural communities. Restoration

of terrestrial natural communities is focused in areas that are identified as biologically rich. Management activities, such as timber harvest and prescribed fire, are used to mimic ecological processes to attain and sustain a high diversity of habitats and species. A wide range of wildlife habitat is provided by restoring and enhancing terrestrial natural communities, and emulating their historical distribution patterns. A broad range of settings for a variety of recreational opportunities are provided, including both developed recreation sites and areas for dispersed recreation like backpacking, hunting, floating, and off-road vehicle use.

Alternative 4

This alternative was designed in response to those who want to see the use of traditional forest management and production of forest commodities emphasized over restoration of natural communities.

Emphasis is on ecosystem enhancement while providing utilization of forest resources. Multiple use management is emphasized for a majority of the Forest. Timber and mineral extraction, and other activities such as recreation are likely to influence ecological processes. A wide range of wildlife habitat is provided by emphasizing achievement of early successional and old growth habitat objectives, as well as protection of special habitats. A broad range of settings for a variety of recreational opportunities are provided including both developed recreation sites and areas for dispersed recreation like backpacking, hunting, floating, and off-road vehicle use.

Alternative 5 – No Action

Alternative 5, the no-action alternative, reflects current Forest-wide direction. It meets the NEPA requirement (36 CFR 219.12(f)(7)) that a no-action alternative be considered. 'No action' means that current management allocations, activities, and management direction found in the existing Forest Plan, as amended, would continue. Output levels have been recalculated for this alternative to comply with new information, in particular, new scientific and inventory data.

The 1986 Forest Plan gives strong emphasis to wildlife habitat development; particularly unique or specialized habitats such as caves, springs, seeps, fens, riparian areas, glades and fishless ponds. Timber management is the primary tool for reaching desired vegetative conditions, wildlife habitat objectives, and providing timber products for local industrial and individual needs. The Plan provides a range of settings for a variety of recreational opportunities including both developed recreation sites and areas for dispersed recreation like backpacking, hunting, floating, and off-road vehicle use.

Alternatives Considered but Eliminated from Detailed Study

The following alternatives were considered in the analysis, but were eliminated from further detailed study. A more complete discussion of these alternatives is included in Chapter 2.

- An alternative considering recommendation of all Inventoried Roadless Areas mapped in the Roadless Area Conservation Rule Final Environmental Statement as Wilderness Study Areas
- An Alternative(s) providing off-road, off-trail cross-country use of motorized vehicles by changing the Forest policy of "closed unless posted open."
- An alternative(s) to restrict or prohibit mineral exploration and development within the Forest or within a specific area, such as the Eleven Point River.

- An Alternative(s) where the Standards and Guidelines for resource management are different, either more or less restrictive.
- An Alternative(s) that includes each of the principles and criteria from the "Citizens' Call for Ecological Forest Restoration: Forest Restoration Principles and Criteria" (Citizens' Call) as standards in the revised Forest Plan

Effects of the Alternatives

The effects of each of the alternatives on the resources and programs of the Forest are summarized in the following table.

Table 1. Comparison of Alternatives by Effects on Resources or Programs

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Timber Production and Supply	No commercial timber harvest allowed. An estimated 25 MMBF would be cut and left on the ground to accomplish ecosystem restoration activities in MP 1.1 & 1.2, and to meet early successional habitat needs in 6.2. Overstocked conditions would result in stands with smaller trees and more susceptible to insect and disease.	Commercial timber harvest allowed. Has the largest allocation of land in MP 1.1 & 1.2, which would influence the amount and type of timber harvest accomplished. Most harvest would be thinning producing industrial roundwood products. Tree planting is allowed along with timber stand improvement activities to enhance conditions of natural communities.	Commercial timber harvest allowed. Most harvest would be thinning producing industrial roundwood products. Tree planting is allowed along with timber stand improvement activities to enhance conditions of natural communities.	Commercial timber harvest allowed. Has less land allocated to MP 1.1 and 1.2 than Alternatives 2 or 3. More harvests would be for regeneration producing more sawtimber products due to shorter rotation ages. Tree planting is allowed along with timber stand improvement activities to enhance conditions of natural communities.	Commercial timber harvest allowed. Most harvest would be regeneration harvest producing hardwood sawtimber products with more pine trees harvested due to shorter rotation ages. Natural regeneration of trees is emphasized. Some timber stand improvement activities would not be allowed in some portions of the Forest.
Ecological Sustainability and Ecosystem Health	Ecosystem restoration and enhancement allowed only in MP 1.1 & 1.2, and would be accomplished by using mechanical treatments and prescribed fire. An increase in shade and the buildup of leaf litter would reduce current species diversity in most of the Forest.	Timber harvest, along with the use of prescribed fire, would move areas toward more open forest and woodlands. Has the largest allocation of land in MP 1.1 & 1.2, allowing more opportunities for restoration and enhancement of ecosystems.	Timber harvest, along with the use of prescribed fire, would move areas toward more open forest and woodlands. A large variety of management activities would be available to use for restoration and enhancement of ecosystems.	Timber harvest, along with the use of prescribed fire, would move areas toward more open forest and woodlands. Land Allocations would result in smaller scale restoration of open forested natural communities with timber harvest and prescribed fire.	No lands allocated specifically for large scale restoration of natural communities; the least number of acres managed for more open forestland. The forest would look much the same as it does today with dense forested and overstocked lands. Fewer management activities could be used to restore or enhance natural communities.

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Wildlife Habitat Management	High chance that Bachman's sparrow would be extirpated from Missouri. More MIS, TES, RFSS and other species of concern negatively affected by lack of management and lack of early successional habitats.	High likelihood that all MIS, TES, RFSS, and other species of concern remain viable and are distributed in historical patterns.	High likelihood that all MIS, TES, RFSS, and other species of concern remain viable and are distributed in historical patterns.	Good likelihood that all MIS, TES, RFSS, and other species of concern remain viable and are distributed in historical patterns.	Good likelihood that all MIS, TES, RFSS, and other species of concern remain viable and are distributed in historical patterns.
Fire and Fuels Management	Fuels management would only be accomplished without removal of timber products, using mechanical treatments and prescribed fire. Less than five percent of the forest would be treated specifically to move from fire regime condition class 3 to 1. Without removal of fallen trees, high fuel loads would remain in the forest. More frequent catastrophic stand replacing wildland fire could occur.	Fuels management and prescribed fire are used to change fire regime condition class at the highest levels resulting in an increase in an open forest and woodlands and a reduction of fuels within the Urban Wildland Interface. Wildland fires should be easier to suppress and have less erratic behavior within treated areas.	Fuels management and prescribed fire are used to change fire regime condition class are at a high level resulting in an increase in an open forest and woodlands and a reduction of fuels within the Urban Wildland Interface. Wildland fires should be easier to suppress and have less erratic behavior within treated areas.	Fuels management and prescribed fire are used to change fire regime condition class are at a level similar to alternative 1. Though timber harvest is used to remove and reduce fuels within the Urban Wildland Interface. Wildland fires should be easier to suppress and have less erratic behavior within treated areas.	No direction to restore fire dependant natural communities or reduce fuel loading in the forest. The least amount of prescribed fire of any alternative due to current management restrictions. Fewer acres would move to a historical fire regime condition class.

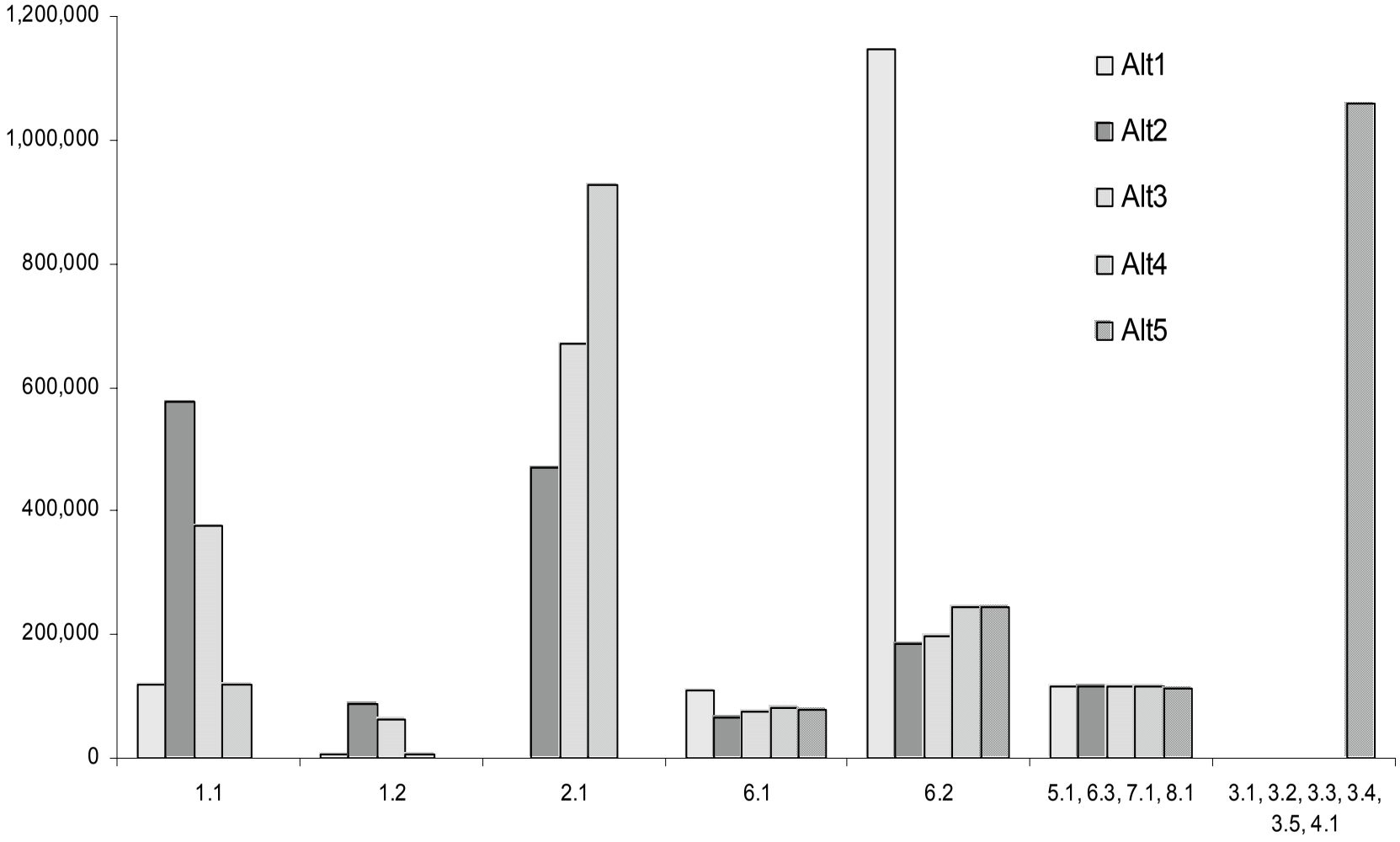
Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Economic and Social Sustainability	Jobs and income resulting from all activities are at the lowest level due to the restriction on commercial timber harvest. Lowest payments made to counties of any alternative.	Jobs and income are the lowest of all management based alternatives. Payments to counties the same for Alternatives 2 through 5.	Jobs and income slightly higher than for Alternative 2. Payments to counties the same for Alternatives 2 through 5.	Jobs and income resulting from all activities are at a level similar to Alternative 5. Payments to counties the same for Alternatives 2 through 5.	Jobs and income resulting from all activities are at the highest level due to an increase in commercial timber harvest and emphasis on sawtimber production. Payments to counties the same for Alternatives 2 through 5.
Management Area Allocations	Minimum land allocation in MP 1.1 and 1.2 considered feasible for restoration of natural communities.	Largest allocation of land in MP 1.1 for 1.2 for large scale restoration of natural communities.	Though less than in Alternative 2, allocation of land in MP 1.1 and 1.2 would allow large scale restoration of natural communities.	Majority of land is allocated to MP 2.1 where timber management is the emphasis. Land allocation in MP 1.1 and 1.2 same as for Alternative 1.	No change from current Forest Plan in management prescriptions or allocations of lands.
Riparian Areas, Water Quality and Soils	Lowest impact on soils due to the least amount of management of any alternative. Due to overall reduction in management as a result of land allocation to semi-primitive areas, the least amount of acres in riparian natural communities would be restored. Areas in riparian or watercourse protection zones are the same for Alternatives 1 through 4.	Soils impacts would be less than in alternative 5 as a result of changed standards and guidelines and differing levels of management activities. The highest amounts of activities to restore riparian communities. Areas in riparian or watercourse protection zones are the same for Alternatives 1 through 4.	Soils impacts would be the same as in Alternative 2. Activities to restore riparian communities between those in Alternatives 2 and 4. Areas in riparian or watercourse protection zones are the same for Alternatives 1 through 4.	Soils impacts would be same as in Alternative 2. The lowest amounts of activities to restore riparian communities. Areas in riparian or watercourse protection zones are the same for Alternatives 1 through 4.	Largest impacts on soils due to highest intensity of timber and other management activities resulting in greater need to temporarily access interior forest areas. No specific direction to restore riparian natural communities. Least amount of acres covered under watercourse management direction.

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Recreation	Estimated 15% decrease in dispersed recreation activities, such as hunting, due to reduced access and species diversity.	Estimated 20% increase in dispersed recreation activities as a result of ecosystem restoration and species diversity.	Estimated 10% increase in dispersed recreation activities as a result of ecosystem restoration and species diversity.	No expected change due to management though could change with population demographics.	No expected change due to management though could change with population demographics.
Recreation Opportunity Spectrum	87% of the Forest would be managed for semi-primitive objectives. More solitude would be found in areas with less management.	22% of the Forest would be managed for semi-primitive objectives. More acres are allocated to roaded natural recreation objectives which would provide for more motorized use.	25% of the Forest would be managed for semi-primitive objectives. Acres allocated to roaded natural recreation objectives are similar to Alternative 2.	25% of the Forest would be managed for semi-primitive objectives. Acres are allocated to roaded natural recreation objectives similar to Alternative 2.	29% of the Forest would be managed for semi-primitive objectives. Slightly more acres are allocated to semi-primitive recreation objectives then in alternatives 2 through 4, though motorized use would be at similar levels.
Wilderness Study Areas Roadless	Thirteen areas recommended for Wilderness study.	Thirteen areas recommended for Wilderness study.	Thirteen areas recommended for Wilderness study.	Thirteen areas recommended for Wilderness study.	No areas recommended for Wilderness study.
Wild and Scenic Rivers	2005 Forest Plan Standards and Guidelines would protect the Outstandingly Remarkable Values of classified Rivers under MP 6.3. Place one additional river into MP 6.3	2005 Forest Plan Standards and Guidelines would protect the Outstandingly Remarkable Values of classified Rivers under MP 6.3. Place one additional river into MP 6.3	2005 Forest Plan Standards and Guidelines would protect the Outstandingly Remarkable Values of classified Rivers under MP 6.3. Place one additional river into MP 6.3	2005 Forest Plan Standards and Guidelines would protect the Outstandingly Remarkable Values of classified Rivers under MP 6.3. Place one additional river into MP 6.3	Current Forest Plan Standards and Guidelines would protect the Outstandingly Remarkable Values of classified Rivers under MP 6.3. NO additional rivers will be classified.
Heritage Resources	2005 Forest Plan Standards and Guidelines would protect the heritage resource values.	2005 Forest Plan Standards and Guidelines would protect the heritage resource values.	2005 Forest Plan Standards and Guidelines would protect the heritage resource values.	2005 Forest Plan Standards and Guidelines would protect the heritage resource values.	Current Forest Plan Standards and Guidelines would protect the heritage resource values.

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Access and Transportation Management	In the short-term, roads would become more difficult to travel on due to limited maintenance and reconstruction. In the long-term, many local, dead-end, maintenance level 2 roads would be closed and/or decommissioned, thus limiting motorized travel to a small road network of maintenance level 3 and 4 roads.	No appreciable changes to the transportation system or the long-term motorized access of the Mark Twain NF.	No appreciable changes to the transportation system or the long-term motorized access of the Mark Twain NF.	No appreciable changes to the transportation system or the long-term motorized access of the Mark Twain NF.	No appreciable changes to the transportation system or the long-term motorized access of the Mark Twain NF.
Rangeland Management	Grazing would be the lowest of all alternatives.	Grazing would be the second lowest of the alternatives, since it would be phased out in MP 1.1 and 1.2 and within riparian areas in an effort to restore glade and riparian natural communities	Grazing would be reduced since it would be phased out in MP 1.1 & 1.2 and within riparian areas.	Grazing would be phased out in MP 1.1 & 1.2 and within riparian areas.	Grazing could continue affecting glade ecosystems and reducing their diversity of species.

Comparison of Alternatives

Comparison of Alternatives by Acres Allocated to Management Prescriptions



Comparison of Alternatives by Key Indicators

Table 2 – Comparison of Alternatives by Key Indicators

Key Indicator	Units	Current Condition	Alternative				
			1	2	3	4	5 No Action
Issue 1 –Timber Supply.							
Average Annual Allowable Sale Quantity (ASQ)	MMBF/year	49*	0	99	103	105	105
Sawtimber Portion (1st Decade)	MMBF/year	38*	0	38.5	43.5	47.5	50
Issue 2 – Ecosystem Sustainability and Ecosystem Health							
Ground cover meeting desired condition for savanna, woodland and glade	Ac/Decade	26,000	35,600	185,500	122,800	35,600	30,000
Acres treated to move towards natural community type	Ac/Decade	<500	17,800	93,300	61,000	17,800	13,000
Acres Burned	Ac/Decade	30,000	73,000	383,000	250,000	73,000	125,000
Acres Thinned	Ac/Decade	<3,000	26,300	143,500	94,500	27,900	<15,000
Issue 3 – Wildlife Habitat Management							
OG Natural Community Types Treated in 1st decade (MP 1.1 and 1.2 only)	Range of Acres	n/a	24,200 to 37,200	125,900 to 193,900	83,400 to 128,400	24,200 to 37,200	0
Natural Community Old Growth in 50 years (MP 1.1 and 1.2 only)	Acres	n/a	5,400	36,700	24,500	12,100	<5,000
Natural Community Old Growth in 100 years(MP 1.1 and 1.2 only)	Acres	n/a	10,800	73,500	49,000	24,200	< 10,000
Early Successional habitat (first decade)	Percent of Forest	2.5%	0.6%	7.3%	7.5%	7.8%	7.5%
Management Indicator community trends	Trends		Slight increase in MP 1.1 and 1.2; Decrease on 77% of Forest	Increase in quantity and quality	Increase in quantity and quality	Slight increase in MP 1.1 and 1.2	No significant change

Key Indicator	Units	Current Condition	Alternative				
			1	2	3	4	5 No Action
Issue 4 – Fire Management							
Acres treated to progress toward Condition Class 1	% of total available Acres	0.07	0.51	0.59	0.57	0.54	0.57
Area treated with Prescribed Fire	Acres/Year	<17,000	61,630	72,420	68,800	63,700	59,320
Issue 5 – Economic Sustainability of Local Communities							
Potential Jobs as result of Forest Management	Number of jobs	4,795	4,563	4,951	4,990	5,081	5,097
Potential Labor Income as result of Forest Management	Millions of dollars	168.2	160.7	174.6	175.5	177.8	178.1
Payments to counties based on 25% funds	Millions of dollars	1.4	1.0	2.2	2.3	2.3	2.4
Area in Semi-primitive management	Percent of Forest	34%	87%	25%	25%	29%	26%

**Average annual timber sold, 1986 - 2003*

Comparison of Alternatives by Resource Indicators

Table 3 - Comparison of Alternatives by Resource Indicators

Key Indicator	Units	Current Condition	Alternative				
			1	2	3	4	5 No Action
Watershed conditions and riparian and aquatic area functioning.							
Total allotment acres of riparian open to grazing	Acres	3,315	1,050	1,780	1,780	1,770	0
Management intensity on sensitive soils	Relativity	Low	Low	Medium	Medium	Medium	Medium-high
Acres potentially moved toward the DC for riparian	Acres	0	12,330	31,300	24,900	12,330	0
Acres in riparian or watercourse management	Acres	65,000	84,500	84,500	84,500	84,500	65,000
Range Management							
Acres of existing allotments available for continued use	Acres	52,092	7,803	10,153	10,820	11,384	20,640
Animal Unit Months supported	AUM	26,635	10,036	22,660	23,102	22,925	26,635