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Mark Twain
National Forest

September 2005

Final Environmental Impact Statement

Appendices A – H

To accompany the 2005 Land and Resource Management Plan (2005 Forest Plan)



Mark Twain
National Forest

Abstract

This final environmental impact statement (FEIS) documents analysis of ten alternatives developed for programmatic management of the 1.5 million acres administered by the Mark Twain National Forest. Alternatives 1-5 were analyzed in detail in the draft environmental impact statement (DEIS). Alternative 3 was the Preferred Alternative in the DEIS and was the foundation for the Proposed Forest Plan. Alternative 3 was modified slightly to address comments on the DEIS. This FEIS documents analysis of all alternatives and displays environmental effects at a programmatic level. Alternative 3 is referenced as the "Selected Alternative" in both the FEIS and the Record of Decision that accompanies this FEIS.

The Selected Alternative, outlined as the *Mark Twain National Forest 2005 Land and Resource Management Plan (2005 Forest Plan)*, guides all natural resource management activities on the Forest; addresses new information and concerns raised since the 1986 Plan was published; and meets objectives of federal laws, regulation, and policies. Rationale for choosing the modified Alternative 3 as the Selected Alternative is described in the Record of Decision for this FEIS.

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Cover photo: Blossom Rock, Lane Spring Recreation Area

Photographer: Nancy Feakes, Mark Twain National Forest

Final Environmental Impact Statement
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To accompany the 2005 Land and Resource Management Plan (2005 Forest Plan)



Barry, Bollinger, Boone, Butler, Callaway, Carter, Christian, Crawford, Dent, Douglas, Howell, Iron, Laclede, Madison, Oregon, Ozark, Phelps, Pulaski, Reynolds, Ripley, Saint Francois, Sainte Genevieve, Shannon, Stone, Taney, Texas, Washington, Wayne, and Wright Counties, Missouri.

Eastern Region
Milwaukee, Wisconsin

September 2005

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Mark Twain
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For more information, visit our web site.
http://www.fs.fed.us/r9/forests/marktwain/

Appendix A

Public Involvement in Issues, Concerns, and Opportunities



Mark Twain
National Forest

Cover image: Horseback Riders on Kaintuck Hollow Trail

Photographer: Charlie Gill, Mark Twain National Forest

Appendix A

Public Involvement in Issues, Concerns, and Opportunities

Introduction

The first step in the forest planning process (36 CFR 219.12(b), 1982 Regulations) is for the interdisciplinary team to identify and evaluate public issues, management concerns, and resource use and development opportunities, including those identified during public participation activities and coordination with other agencies and entities. The Forest Supervisor then determines which of these issues, concerns, and opportunities to address in the revision process. This appendix describes how the Mark Twain National Forest met this requirement.

Process Used to Identify Issues

Key points in the forest plan revision process where the public provides input include developing the need for change, identifying potential issues and possible alternatives for addressing the issues, analysis of possible environmental effects, and publication of the Draft Environmental Impact Statement (DEIS) and Proposed Forest Plan.

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 Need for Change discusses the process and information used to develop proposed changes to the 1986 Forest Plan. A Notice of Intent to Revise the Forest Plan was published in the Federal Register on April 16, 2002.

Public Involvement Methods

The Mark Twain National Forest used a variety of public involvement tools and methods, including public meetings, open houses, newsletters, and news releases to engage individuals, organizations, state and local governments, and other federal agencies in the Forest Plan revision.

The Forest hosted a series of public meetings both before and after the Notice of Intent was issued to provide information about the forest plan revision process and gather public input on the scope of the decisions to be made, issues to be examined and possible alternatives. Subsequent Forest-planning open houses, newsletters, and news releases informed the public about the progress of the revision. The Forest consulted and exchanged information with local county governments, State agencies, and other national forests and federal agencies throughout the plan revision process to aid in development of revised management goals and objectives, and standards and guidelines.

Meetings and Open Houses

Early in 2002, we held three public meetings before we published our Notice of Intent. Forest resource specialists made presentations and were available for a question and answer period. The meetings were held at 7 o'clock in the evening on the following dates and locations:

- Thursday January 17, 2002 at the Settle Inn in Branson, Missouri;
- Tuesday January 22, 2002 at the Senior Center in Houston, Missouri; and
- Tuesday February 5, 2002 at the Powder Valley Conservation Nature Center in Kirkwood, Missouri (suburb of St. Louis)

We felt these locations would be the most convenient for people with interest in National Forest management. Four people attended the Branson meeting. Thirty people came to the meeting in Houston, and 103 people attended the Kirkwood meeting.

Public input from these meetings was used to help determine necessary changes, actions that should be taken, and issues to be reviewed in the Forest Plan revision process. From public input and internal evaluations, we developed the proposed action and began the NEPA process by publishing a Notice of Intent (NOI) in the Federal Register.

After the NOI was published, we held four more public meetings in June 2002 to give the public a chance to meet the Forest Planning staff and other resource specialists, to become more familiar with the planning process, and provide input on plan revision. These meetings were in the evening from 7:00 to 8:30 on the following dates and locations:

- June 6, 2002 at the Civic Center in West Plains, Missouri;
- June 13, 2002 at the Black River Coliseum in Poplar Bluff, Missouri;
- June 20, 2002 at the Civic Center in Farmington, Missouri; and
- June 27, 2002 at the Lenoir Community Center in Columbia, Missouri

Sixteen people attended the West Plains meeting, 19 came to Poplar Bluff, 7 to Farmington, and 24 to Columbia. Revision Topics were refined, alternatives developed, and effects described based on input from those meetings.

In April 2003, we held another series of meetings to provide information on our approach to ecosystem management, discuss Off-Highway Vehicle use on the Forest, answer questions and hear what the public had to say. The meetings were at 7:00 in the evening on the following dates and locations:

- Tuesday April 8, 2003 at the Senior Center in Alton, Missouri;
- Thursday April 10, 2003 at the Community Building in Ozark, Missouri;
- Tuesday April 22, 2003 at the City Hall in Salem, Missouri; and
- Tuesday April 29, 2003 at the Madison County Senior Center in Fredericktown, Missouri

These meetings were useful in letting the public know the direction we are taking in revising the Forest Plan. It helped keep the public informed of where we were in the process and gave us an opportunity to learn from their questions and concerns.

In February 2004, we held another round of meetings to discuss the alternatives we had developed, clarify our position, and answer any questions. These meetings were in the evening on the following dates and locations:

- February 10, 2004 at the University of Missouri in Rolla, Missouri; and

- February 17, 2004 at the Powder Valley Conservation Nature Center in Kirkwood, Missouri

In February of 2005, after the release of the Proposed Revised Forest Plan and DEIS, we held another series of open houses to present the Draft Environmental Impact Statement and answer questions about the analysis and the preferred alternative. These meeting were held in the evening from 6:00 to 8:00 on the following dates and locations:

- February 8, 2005 at the Powder Valley Conservation Nature Center in Kirkwood, Missouri (suburb of St. Louis);
- February 15, 2005 at the Old City Hall Building in Salem, Missouri;
- February 22, 2005 at the Civic Center in West Plains, Missouri;
- March 15, 2005 at the Black River Coliseum in Poplar Bluff, Missouri;
- March 22, 2005 at the Library Center in Springfield, Missouri

These meetings were important for providing the public a forum to ask questions about the Proposed Revised Plan so that they could provide comments that were more informed.

Special Meetings Requested by Groups

Throughout this process, several meetings were held with other state and federal government agencies and special interest groups to talk about specific issues. Meetings were arranged and held at the request of the group or agency.

- On July 23, 2002, the Missouri Equine Association invited the Forest Planning Team to make presentations and answer questions at their meeting at the Greene County Library in Springfield, Missouri. Over 227 people attended.
- On April 12, 2003, a meeting was held with the Missouri Coalition for the Environment to discuss revision topics and concerns in Rolla, Missouri. Nine members of the Coalition attended this meeting.
- On June 19, 2004, another meeting was held with the Missouri Coalition for the Environment to discuss revision topics and concerns in Rolla, Missouri. Six people from the Coalition attended.
- On April 29, 2004, the Forest planning team met with the American Foresters Policy Committee to discuss the Forest Plan Revision and National Forest management.
- On January 12, 2005, the Forest Supervisor and Deputy Forest Supervisor met with Brent Bryant, Missouri Cattlemen's Association, in Jefferson City, MO, to discuss the proposed reduction in grazing allotments and various ways to maintain a stable range program.
- On January 22, 2005, the Forest Supervisor met with the Cedar Creek Grazing Association to discuss the proposed reduction in grazing allotments and various ways to maintain a stable range program.
- On February 12, 2005, the Forest Supervisor met with the Conservation Federation to discuss the Forest Plan Revision.
- On April 5, 2005, the members of the Forest planning team meet with the Missouri Department of Conservation to discuss the Forest Plan Revision.
- On March 24, 2005, members of the Forest planning team meet with the representatives of the Environmental Protection Agency to discuss the Forest Plan Revision.

- On March 10, 2005, the Forest Supervisor for the Mark Twain National Forest met with the Missouri Department of Natural Resources to discuss the Forest Plan Revision.
- On May 3, 2005, the Forest Supervisor and some members of the planning team meet with the Coalition for the Environment to discuss the Forest Plan Revision.
- The Forest Supervisor participated in several meeting with the Missouri Forest Products Association to discuss the Forest Plan Revision.

Federal Register Publication

On April 16, 2002, we published a Notice of Intent (NOI) to prepare an Environmental Impact Statement to Revise the Forest Plan in the Federal Register. The NOI described the Revision Topics in detail and explained how the public could get more information or provide their comments on the topics. Comments received in response to the NOI were used to refine the Revision Topics, develop alternatives, and describe effects in the Draft EIS.

We published a Notice of Availability (NOA) for the Draft EIS and Draft Forest Plan in the Federal Register on February 4, 2005. The NOA described the preferred alternative and explained how the public could get additional information or provide comments. Comments received about the Draft EIS and Forest Plan were considered and incorporated into the Final EIS and Record of Decision (ROD). Responses to the comments received can be found in Appendix A-1 of this Final EIS.

Newsletters

Nine issues of the Mark Twain National Forest *Planning Journal* were sent to a mailing list of almost 600 addresses. The first issue of the *Planning Journal* was published in October 1997. Each issue contained information about our Forest Plan and provided several ways for the public to get involved in the process. There were informative articles discussing the role of a Forest Plan, describing various aspects of the planning process and regulations, introducing the Forest Supervisor and staff tasked with revising the Plan, and continual updates on the status of the revision. Each *Planning Journal* coincided with significant milestones in the process, such as announcing publication of the NOI, or accompanying distribution of the Annual Monitoring and Evaluation Report. They discussed important developments, like the Programmatic Biological Assessment and Biological Opinion for Endangered Species, or gave detailed explanations of the Forest transportation system policy.

News Releases

At every significant milestone, news releases were prepared and distributed to area newspapers, including the Associated Press and National Public Radio. Each news release informed the public of the status of our revision and gave them information on how to provide comments or get additional information.

Letters

In order to keep them informed of our progress, describe our proposal, and ask for concerns several entities received individual letters. We sent Forest Plan Revision information to Jay Nixon, Attorney General for the State of Missouri. On May 7, 2002, twenty-nine Presiding Commissioners for each county with National Forest System land received a letter describing Forest Plan revision and detailing how to get additional information. District Rangers followed up with phone calls or personal visits. Additionally, sixteen Native American tribal

leaders with interest in management of the Mark Twain National Forest were sent letters to informing them of our planning process and activities.

Website

The Mark Twain National Forest posted information and pertinent documents about Forest Plan Revision on its website at http://www.fs.fed.us/r9/forests/marktwain/. All correspondence referenced the website so anyone with access to the internet could find additional information on the Revision.

Public Input and the Forest Plan Revision Topics

The Forest Plan revision process focused on revision topics. The revision topics address central issues and public concerns to which future management of the Mark Twain National Forest must respond. The Proposed Forest Plan and alternatives were developed to answer questions raised by these revision topics. The following discusses how public input influenced each of the revision topics.

Revision Topic 1 - Vegetation and Timber Management

Issues and Public Concerns

A number of respondents suggest that Forest management should include a non-commercial alternative option. This option should explore the economic and ecological impacts of the non-commercial approach. The role of Forest Service management then becomes to adopt policies and techniques of assisting in recovery of the natural integrity of the Forest to the point where natural processes can function unencumbered. Others advise the Mark Twain to restrict or prohibit commercial development of natural resources.

A number of respondents comment in general that the Mark Twain National Forest should end commercial timber sales. Some argue moreover that it is not necessary to harvest timber from public land inasmuch as private landowners are capable of meeting the country's timber needs; and that foreign exportation of timber from the Mark Twain should be banned.

Revision Topic 1a – Identify lands suited to timber production

Issues and Public Concerns

Many people agree that we should re-evaluate lands suitable for timber production . Some suggest reducing the allowable sale quantity by excluding riparian, roadless, and recreation areas from consideration. In addition to considering environmental effects, others ask that re-evaluation of timber suitability consider the impact on local economies. People also encourage the Forest to take intermediate and long-range projections of timber harvest levels into account in the Forest Plan revision.

How addressed in Proposed Forest Plan

Old growth, the Seven Sensitive Areas, Riparian Management Zones, glades, cedar hardwoods, recreation areas, and protection areas for karst features is removed from lands suitable for timber production. Revised demand estimations and harvest yield tables, and recalculated ASQ determinations are the basis for those changes.

Revision Topic 1b – Maintain oak-hickory, shortleaf pine and oak-pine communities by providing for adaptive management and greater flexibility of silvicultural techniques

Issues and Public Concerns

There are considerably different viewpoints regarding the topics of even-aged and uneven-aged management. While many support even-aged management for mast production, for purposes of measuring specific habitat conditions, and for the benefit of early-successional dependent wildlife; others are just as adamant that no clear-cutting or even-aged management be allowed in the Mark Twain.

Finally, some express concerns relative to certain species. Specifically, people ask the Mark Twain NF to explain the basis for its decision to maintain oak-hickory, shortleaf pine, and oak-pine communities by silvicultural techniques; to continue restoration of the shortleaf pine forests of southern Missouri; and to continue to delineate the land-type associations and ecological land types on which allow pine planting.

How addressed in Proposed Forest Plan

Forest Plan standards and guidelines specifying where even-aged and uneven-aged management can be used were eliminated, thereby providing greater flexibility. Project level analysis will yield decisions regarding silvicultural systems and methods.

Revision Topic 2 - Ecological Sustainability and Ecosystem Health

Revision Topic 2a - Restore and maintain healthy forest ecosystems; provide a healthier balance of shortleaf pine and white oak; restore open woodland habitats

Issues and Public Concerns

Numerous respondents assert that the Mark Twain National Forest should promote forest ecosystem health and sustainability. Notes one respondent, “The Forest Service should adopt techniques and policy that seek to assist in the recovery of the natural integrity of the ecosystem to the point where natural processes can function unencumbered and without negative effects outside the natural range of variability.” Many argue that “emphasis should be to restore forest habitats to their historically native species.” Several suggest that “Missouri has few pristine areas left, and the forest, wildlife, and public could best be served by ecological restoration of glades and savannas.”

Some respondents ask the Mark Twain NF to address native plants in the forest plan revision. Specifically, some urge the Forest to maintain natural forest types, aggressively restore natural vegetation and native terrestrial communities on large regional scales, and identify and protect all unique plant communities.

How addressed in Proposed Forest Plan

The 2005 plan places greater emphasis and focus on restoring and enhancing ecosystems at the terrestrial natural community level. Forest-wide standards and guidelines reference use of the Terrestrial Natural Communities of Missouri (Nelson 2004) and the local historic land survey data for purposes of project inventory, vegetation mapping, and determining treatments appropriate to meeting desired condition. Forest Plan objectives are based upon historical amounts and distribution patterns of natural communities, and vary by ecological subsection. Management Prescriptions 1.1 and 1.2 identify globally significant natural communities, target specific areas for priority treatment, and protect examples of viable ecosystems. Forest Plan objectives focus on management activities, such as prescribed

burning or timber harvest, to promote ecological functions by emulating disturbance processes.

Revision Topic 2b - Encourage natural vegetation by allowing pine and oak reforestation and stand improvement in a wider variety of situations

Issues and Public Concerns

Very few people commented on this topic. Those that did comment encouraged the Forest to use the full array of silvicultural tools to achieve forest health and ecosystem composition objectives, and to continue restoration of shortleaf pine communities where they would have occurred before European settlement of the area.

How addressed in Proposed Forest Plan

The 2005 Forest Plan removes restrictions in management prescriptions on the type of reforestation and timber stand improvement. This allows pine and oak reforestation and stand improvement in a wider variety of situations.

Revision Topic 2c - Provide a wide diversity of natural communities and wildlife habitat conditions

Issues and Public Concerns

A number of people urge the Mark Twain NF to protect and restore wildlife habitat, particularly for native species and those species requiring large tracts of contiguous forest. Some stress the particular need to preserve bird habitat. That will result, some point out, in increased bird populations, which will in turn feed on insects which otherwise cause so much forest damage. Others ask that we enhance ruffed grouse populations by preserving their habitat .

Some urge the Mark Twain to promote aggressively early successional conditions—in order to promote population growth in early successional bird species, and to comply with NFMA's requirement to maintain viable populations of all native wildlife. Others express an interest in old growth conditions. According to one respondent, the Forest should evaluate old growth opportunities, "independently of potential timber stands. Opportunities must be based on both landscape and structural characteristics. Any stand that meets either or both characteristics should be designated old growth." Some say priority for inclusion in old growth designations should be riparian areas.

How addressed in Proposed Forest Plan

Management direction is developed to provide wildlife habitat, contribute to recovery of threatened and endangered species, and protect species at risk by restoring and enhancing forest health and ecological integrity for a range of early, mid, and late successional forested ecosystems. Definition of desired conditions for a range of natural variability in structure, composition, basal area and ground cover characteristics for various natural communities exist in Management Prescriptions 1.1 and 1.2. Objectives vary by ecological subsection, based on historical amounts and distribution patterns of natural communities. Management prescriptions provide specific objectives for old growth and young forest habitats . Protection is provided for special habitats and the species that use them.

Revision Topic 2d – Revise list of Management Indicator Species (MIS)

Issues and Public Concerns

Respondents agree that the MIS list needs revision. Specific suggestions include species that reflect health of the ecosystem; those requiring large, unbroken blocks of habitat; old growth species; early successional species; large predators; endangered species; amphibians; and species that could serve as indicators of water quality.

How addressed in Proposed Forest Plan

The list of management indicator species focuses on species most likely to provide an indication of the effects of management to natural communities considered most in need of restoration.

Revision Topic 3 - Fire Management

Issues and Public Concerns

General concerns regarding fire management are varied. One individual asserts that "the Forest Service takes contradictory attitudes toward fire, considering it a hazard that must be mitigated by logging (such as with the recent tornado blow-down) and as a necessary part of the environment that must be applied by humans." Other respondents urge the Mark Twain NF to address issues surrounding fire fighting, and work with adjacent landowners and communities in promoting fire safety measures.

Revision Topic 3a - Use prescribed fire to restore ecosystems, maintain healthy forests, provide wildlife habitat, and reduce hazardous fuels.

Issues and Public Concerns:

The use of prescribed fire is a topic of concern to numerous respondents. People urge the Mark Twain to use fire to "emulate historic natural disturbance regimes;" to "restore and maintain [the] Ozark's ecosystems" and thereby restore biodiversity; to "restore some of the large scale communities that benefit from periodic fire;" and to "maintain healthy glades, forests, wildlife habitat, and to reduce fuel loads." Some, however, caution the Forest to use fire only on a limited basis, while a few say fire should not be used at all "since we in the Ozarks do not have the catastrophic fires of the northwest."

A number of respondents raise concerns over the adequacy of analysis regarding fire management. Some state that the Mark Twain NF should scientifically assess the history, scope, and ecological role of fire inasmuch as there is presently "little data . . . available to understand the impacts of fire on the forest." Others urge the Mark Twain to present all studies and other information it is using in the application of fire on the forest inasmuch, some argue, as "there is wide discrepancy in the literature on the effects and necessity of fire in the Ozark region." Likewise, say some, the Forest should base frequency and seasonal scheduling of prescribed fire on ongoing scientific studies.

How addressed in Proposed Forest Plan

Standards and guidelines for the use of prescribed fire for restoration and enhancement of natural communities, and for hazardous fuels reduction are in place. Objectives developed to increase from current levels the number of acres prescribed burned exist.

Revision Topic 3b - Manage wildland fires to protect life, property, and communities.

Issues and Public Concerns:

Commenters asked that we develop standards and guidelines for firefighting, and address the impacts of firefighting. Other suggestions included involving local landowners and communities to promote fire safety awareness.

How addressed in Proposed Forest Plan

Suppression response is based on a comprehensive dynamic risk assessment, which identifies values at high risk and appropriate management response. Areas of low risk are identified where a full range of responses are available, including wildland fire use to meet the desired condition. Direction is provided to identify Wildland Fire Management Units.

Revision Topic 3c - Improve and maintain forest health and reduce the intensity of wildland fires through a proactive approach to fire and fuels management.

Issues and Public Concerns:

While there were comments that specifically mentioned treatment of hazardous fuels, the concerns and comments mentioned above for fire management, the use of prescribed fire and wildfire suppression, also apply to this topic.

How addressed in Proposed Forest Plan

Forest Risk Assessment identifies areas on the Forest that are at high risk for wildfire. Hazardous fuels reduction treatments focus on community protection. Fire becomes a major component of ecosystem restoration, using a variety of prescriptions including natural fire to meet management objectives.

Revision Topic 4 - Management Areas

Revision Topic 4a - Adjust management area boundaries as needed to incorporate ecological landtypes, current social demands, and management practicalities.

Issues and Public Concerns:

Several writers commented on boundaries and new land-type associations. Suggestions include:

- base management boundaries on national, regional, and local considerations;
- use the revised land-type association (LTA) boundaries to delineate management areas;
- revise management unit area descriptions and boundaries according to the latest ecosystem based classifications; and
- describe a new management unit category for restoring significant native landscapes, one that "[targets] several areas where the best opportunity is presented for restoring the health and vitality of native natural landscapes (including sustainable timber practices) . . . ."

How addressed in Proposed Forest Plan

Field verification of new LTAs indicates that resolution is too fine for programmatic direction, and were not used to define management area boundaries. New management area boundaries are based on the identification of priority areas for restoration of natural

communities, existing management area boundaries, and management practicalities. Forest Plan Objectives are prescribed by ecological subsection, rather than by LTA.

Revision Topic 4b - Protect Roadless, wilderness, wild, and scenic river values, and other "special areas."

Issues and Public Concerns:

A number of respondents request that the Mark Twain NF protect special areas in the forest. Some ask us to set aside more land for special area designation and be preserved in protective management designations.

With respect to special area allocations, a number of respondents express specific concern over the management of roadless areas. Many respondents ask the Mark Twain to protect roadless areas. Some say simply that the Forest "should strive to maintain the integrity of all unroaded areas, no matter how small in size." Others point to characteristics of roadless areas as justification for their protection, e.g. that they serve as models of habitat restoration, are resistant to fire and invasive pests, provide refuge for endangered species, and are important for recreation and their existence value. A number of people also urge the Mark Twain NF to manage roadless areas as wilderness areas, and to recommend roadless areas to Congress for wilderness designation.

Some also advise the Mark Twain to recommend more areas in general for Wilderness designation— some suggest recommending greater amounts of contiguous acreage, others suggest recommending the entire forest.

Finally, respondents also offer comments regarding wild and scenic river designations. Some ask the Forest to review standards and guidelines for managing wild and scenic rivers to see whether they should be tightened based on past implementation; others ask us to recommend high quality rivers for inclusion in the wild and scenic river system.

How addressed in Proposed Forest Plan

Roadless areas were inventoried and evaluated for their potential for Wilderness designation. Some of those areas adjacent to existing Wilderness, including Irish excluded lands, are recommended for study.

A rivers inventory did not identify any additional rivers with potential for inclusion in the Nation's Wild and Scenic River system.

Revision Topic 5 - Riparian Areas and Water Quality

Issues and Public Concerns:

Numerous respondents advise the Mark Twain NF to manage the forest with water quality in mind. Several writers ask the Forest to protect water quality by restricting certain activities, particularly road construction, timber harvest, mining, grazing, and use of herbicides. Respondents also ask the Mark Twain to revise riparian guidelines, to allow flexible site-specific management, protect surface and subsurface waters, and protect karst lands.

How addressed in Proposed Forest Plan

Riparian areas and aquatic ecosystems are defined based on landform, soils, hydrologic criteria and plant communities. Riparian Management Zones and Watershed Protection Zones established to restore and maintain ecological function and processes of riparian areas, aquatic systems and water quality. Standards and guidelines are developed to protect water quality and ecological processes associated with karst terrain and karst features.

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

Issues and Public Concerns

Many respondents assert that the Mark Twain NF should address threatened and endangered species in the Forest Plan revision in order to comply with the Endangered Species Act, and to reflect recent data.

Others, however, disagree. According to one writer, the recent amendments "made several significant changes to the way that the Forest Service would manage the Mark Twain Forest for those species identified in consultation with the US Fish and Wildlife Service. This amendment adequately covers the present need and any unforeseen need can be addressed with future amendments."

Aside from the question of whether this topic should be formally addressed in the Forest Plan revision, numerous respondents write that the Mark Twain should make a special effort to protect threatened, endangered, and sensitive species. Particular species mentioned include mountain lions, endangered reptile and amphibian populations, the Ozark hellbender, bats, eagles, and various rare butterflies.

How addressed in Proposed Forest Plan

Management direction provides for federally listed species not previously addressed. Management for other federal and RFSS are refined and updated.

Revision Topic 7 -Access and Transportation Management

Issues and Public Concerns:

Of those respondents who address construction, maintenance, or closure of roads, the majority ask the Forest to either restrict or prohibit any more road construction or to close roads. These writers assert that the current backlog of needed road maintenance and negative effects roads have on other resources are sufficient grounds for foregoing more construction.

Likewise, some urge the Mark Twain NF to close roads, particularly unclassified or non-essential roads.

On the other hand, a few respondents ask the Mark Twain to upgrade main entrance roads to wilderness areas, and to keep roads open as they provide access for fire fighting.

Revision Topic 7a - Road density standards in management area prescriptions

Issues and Public Concerns:

Some respondents assert that the Mark Twain NF should develop road density standards "because road densities and placement can have a significant impact on wildlife, recreation, water quality, and scenic beauty." Likewise, others request that the MTNF reduce road density in sensitive areas both because of the maintenance backlog and because of attendant erosion.

How addressed in Proposed Forest Plan

Recreation opportunity spectrum class objectives are assigned for each management prescription, which replace road density standards.

Revision Topic 7b – "Woods Roads"

Issues and Public Concerns:

Commenters would like clarification of terminology used for different types of roads.

How addressed in Proposed Forest Plan

The term "woods road" is eliminated. Those roads will be assigned standard maintenance levels.

Revision Topic 7c - Forest Plan Transportation Map

Issues and Public Concerns:

Commenters noted that new regulations require forests to maintain a roads inventory.

How addressed in Proposed Forest Plan

The Forest Plan Transportation map will be eliminated. The Forest Transportation Atlas will contain an inventory of roads on the Forest. Changes to the road system will be project level decisions.

Revision Topic 7d - OHV and ATV use on the forest

Issues and Public Concerns:

Of those who address the use of "closed unless posted open" signs for roads, the consensus is that they should be changed to "open unless posted closed." Respondents argue that the use of these signs is counterproductive inasmuch as:

- more dispersed riding areas are needed
- many roads that were once open have not been posted as open
- current policy is unenforceable;
- it is "inappropriate and or confusing as it contradicts all other normal and traditional marking of travel ways across the country;" and
- reversal of this policy would be more workable and acceptable to user groups.

How addressed in Proposed Forest Plan

Forest direction for OHV and ATV use is stated more clearly.

Revision Topic 8 - Monitoring and Evaluation

Issues and Public Concerns:

Many agreed with the need for effective and meaningful monitoring of management activities.

How addressed in Proposed Forest Plan

Strategy for monitoring and evaluation reflects ecosystem management and ecological sustainability concepts and approaches. The monitoring strategy focuses on information that will (1) enhance understanding of resource management issues; (2) is measurable and scientifically supported; and (3) is feasible given probably budgets.

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. 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.

Many decisions and management direction provided in the 1986 Forest Plan appear to be adequately addressed and do not need to be changed. While some decisions or resource areas may have a high level of interest, this alone does not insure they will be addressed in the Forest Plan Revision. Others areas are not considered to be among the highest priority topics to be included in this revision. Parts of the Forest Plan that are most frequently mentioned as needing revision are described below, along with rationale for not changing them at this time.

Rivers eligible for Wild and Scenic River designation

The 1986 Forest Plan identified parts of seven rivers, which flow through the Mark Twain National Forest, as eligible for inclusion in the National Wild and Scenic Rivers system. Formal suitability studies are required to determine whether a recommendation be made to Congress regarding designation of these rivers under the Wild and Scenic Rivers Act. These suitability studies have not been undertaken.

Under current Forest Plan direction, these rivers and the NFS lands around them are managed to perpetuate their current condition and protect their unique qualities. There has been no widespread public support, or any indication from the State, other Federal agencies, or Congressional delegations that there is a need to change the current management of these rivers or to conduct a suitability determination at this time.

We do not propose any changes to the management direction for the rivers currently identified in the 1986 Forest Plan as eligible for Wild and Scenic River designation.

Off-road vehicle use on the Forest

Under the current plan, the Forest is, “closed unless posted open” to motorized use. This means that off-road vehicle use is restricted to designated trails or use areas. Off-road vehicles may also use Forest Service classified roads (system roads), if the vehicle complies with State law. The Forest Plan allows for development and designation of additional trails and use areas. Currently, the only designated trails on the Forest are the Sutton Bluff trail system, and the only designated use area is the Chadwick Motorcycle and ATV Use Area.

Off-highway vehicles (OHV) and all-terrain vehicles (ATV) users have expressed a strong interest in using existing, unclassified roads. The Forest Plan considers all unclassified roads to be closed, whether or not there is a physical closure, and therefore off-limits to all motorized vehicle use. Over the last several years, use of the Forest by off-road vehicles, especially ATVs and OHVs such as Jeeps, has increased exponentially. Much of this use occurs off-road as well as on unclassified roads, and has become increasing difficult to manage.

Some nearby Forests originally allowed off-road and off-trail OHV and ATV use, but found the use to be very heavy and difficult to manage. Those Forests initiated planning processes resulting in significant plan amendments that changed the management from “open unless posted closed” to “closed unless posted open.”

Allowing motorized use of unclassified roads, essentially allowing off-road and off-trail use, would radically change the existing Forest Plan direction for Mark Twain National Forest lands. Based on monitoring results, interpretation of national policy trends, other Forests’ experiences, and our own experiences trying to manage ATV and OHV use, we do not believe that a major change in Plan direction is warranted for off-road motorized use.

Recreation Management

The Forest recently amended the Plan to update goals and management direction for recreation. The amendment expands emphasis of the recreation program from providing dispersed recreation to include providing quality, developed sites. The amendment added direction that allows investments in recreation facilities needed to meet needs and desires of the public being served by the facility and to provide recreation visitor information. The amendment also added Management Prescription 7.1 to the Forest Plan, emphasizing intensive recreation opportunities occurring in the more highly developed recreation areas. Management Prescription 7.1 better defines the desired future condition for developed recreation areas, as well as expectations and objectives by which recreation areas will be managed. It also provides increased flexibility as trends in recreation activities change, allowing for greater diversity in recreational opportunities. We do not propose any additional changes in direction for recreation management at this time.

Heritage Resources Management

Another recent 1986 Forest Plan amendment addresses current federal mandates and compliance requirements for heritage resources. Processes were included for preservation efforts to restore and interpret selected heritage sites, increase public outreach, and develop public education and volunteer programs. We do not propose any additional changes in direction for heritage resources management at this time.

Fish and Aquatic Management

An additional amendment to the Forest Plan incorporates goals and management direction for fish and aquatic species into the Forest Plan. The amendment provides for protection of aquatic ecosystems, restoration of degraded aquatic ecosystems and recovery of threatened and endangered aquatic species, and enhancement of aquatic resource user opportunities by increasing system productivity, improving user access and/or associated amenities, and providing environmental education and interpretation. We do not propose any additional changes in direction for fish and aquatic management at this time.

Minerals Exploration

Under the Mineral Resources on Weeks Law Land Act of March 4, 1917, mineral prospecting is permitted on lands acquired by Weeks Law Act authority, which includes most lands of the Mark Twain National Forest. While the Bureau of Land Management has responsibility and authority over federally owned minerals, including those lying under National Forest System lands, the Forest Service is responsible for administration of surface resources on the Mark Twain National Forest.

The 1986 Forest Plan states that all lands are available for exploration when methods and technologies are used that do not disturb the land surface. Surface-disturbing exploration, including core drilling, is permitted where it is compatible with management area objectives. Surface-disturbing exploration is prohibited on administrative sites, developed recreation sites, endangered and threatened species habitat, National Trails System, over known caves, and in Wilderness. The goals established in the Forest Plan for minerals management are to provide for mineral prospecting and mineral development while complementing other resource management objectives. Management direction protects soil, water, wildlife, scenery and other resources.

There is a high level of interest and widely differing opinions about mining and processing of lead in Missouri. The responsibility of the Forest Service regarding mining is limited to

surface activities, primarily those associated with exploration for minerals. We believe that the Forest Plan contains appropriate and adequate direction in regards to the surface activities associated with mining that occur on the Mark Twain National Forest, and we do not propose any changes to management direction in the 2005 Forest Plan.

Changes between the Draft and Final Environmental Impact Statements

We received a great deal of public and internal comments on our Draft Environmental Impact Statement (DEIS) and the Proposed Revised Plan. Based on the many comments received, several changes were made to the Forest Plan, and additional analysis was added to the FEIS.

The changes range from minor edits and clarifications to changes in the standards and guidelines and monitoring requirements. Changes are described in detail in Chapter 2 of this FEIS. See also response to comments in Appendix A – 1 for additional information.

Appendix A-1

Response to Comments



Mark Twain
National Forest

Cover image: Tupelo Trees at Cupola Pond National Natural Landmark and Missouri State Natural Area

Photographer: Debbie Mosley, Mark Twain National Forest

Appendix A-1

Response to Comments

Introduction

This appendix includes a description of the formal public comment analysis and response to comment process, and a list of public concerns and our agency responses for the draft forest plan and draft environmental impact statement (DEIS). Public concern statements and responses to them are organized by section to mirror the order of the final environmental impact statement (FEIS) by topic area. This appendix also includes scanned copies of the city, county, state, federal, and tribal agency letters and a list of organizations that submitted comments.

Content Analysis Process

All letters, e-mails, faxes, and comment forms received as public comment on the draft forest plan and DEIS were compiled, organized, read, and analyzed by a government contractor, American Consultants LC, using a process developed and overseen by the U.S. Forest Service Content Analysis Team (CAT), a unit of the Washington Office Ecosystem Management Coordination branch.

Agencies have a responsibility under the National Environmental Policy Act (NEPA) to first "assess and consider comments both individually and collectively" and then to "respond . . . . stating its response in the final statement." The content analysis process used by American Consultants LC considers comments received "individually and collectively" and equally, not weighting them by the number received or by organizational affiliation or other status of the respondent.

This content analysis process is designed to systematically manage large volumes of information while capturing the full range of public viewpoints and concerns. Content analysis is intended to facilitate good decision making by helping the agencies involved clarify, revise, or incorporate technical information to prepare the Final Environmental Impact Statement. All submissions (letters, emails, faxes, and other types of input) are included in this analysis.

The content analysis process is comprised of three main components: a topical coding structure and standardized process for its application, a comment database and mailing list, and a set of summary reports. In the content analysis process, each letter, postcard, fax, email, response form, or other document (collectively referred to as "response letters" in this appendix) is assigned a unique tracking number. Each author or signatory to a response is called a "respondent." All respondents' names and addresses are entered into a project-specific database program to produce a complete mailing list. Each respondent is also assigned a unique identifier number for tracking purposes. All respondents are linked to their individual responses and comments in the database using these identifying numbers. Project-specific demographic information is also recorded in the database, such as any self-identified organizational affiliation or whether the response letter submitted is part of an organized response campaign.

Staff analysts then read all public response letters in their entirety and proceed to identify discrete comments within them that relate to a particular concern, resource consideration, or proposed management action. Every effort is made to keep each comment within sufficient context that it is a stand-alone statement. Analysts look for not only each action or change requested by the public, but also the reason(s) behind each request in order to capture the full argument of each comment. Therefore, paragraphs within a response letter may be divided into several comments because multiple arguments are presented, or alternatively, several paragraphs that form one coherent statement may be coded into one comment. While simple statements of opinion without a rationale are captured in the process and entered in the project database, it is the strength of each rationale as a complete argument that provides the interdisciplinary team a substantive comment to consider.

Once stand-alone comments are identified, analysts assign each comment to a numerical code that identifies the overall subject area. They use a systematic numerical categorization, or coding structure, that has been specifically tailored to project documents. Each project-specific coding structure is a tool to help sort comments into logical groups by topics. The coding structure and other supporting documentation is available in the administrative record at the Supervisor's Office in Rolla, MO.

After being coded, each response letter's set of coded comments is entered verbatim into the project database. This database serves as the complete project record and allows analysts and planning team members to run specialized reports, identify public concerns, and determine the relationships among them.

The content analysis process also identifies response letters that are submitted as part of an organized response (or "form letter") campaign and therefore contain identical text. These are grouped by campaign, and all mailing information for each respondent is entered into the project database, as well as an identifier code for the campaign. Analysts also code a master campaign letter and enter all comments verbatim into the project database so that they are considered alongside all non-campaign comments. If respondents add original comments to the organized response letter they submit, these comments are identified, separately coded, and entered into the database.

The third phase of content analysis includes the composition of summary statements of public concern and the preparation of a narrative report. Analysts review the entire comment database sorted by topic area, and then write public concerns to summarize comments that present similar arguments or positions. Each Public Concern (PC) is worded to capture the action that one or more members of the public feel decision-makers should take, and often includes a set of subconcerns that indicates the reason for this request. Because each concern statement is a summary, it can represent one or many comments, depending on the actual comments submitted. Concern statements range from extremely broad generalities to extremely specific points because they reflect the content of verbatim public comments. A selection of supporting verbatim comments from the public are then organized under these public concern statements so that reviewers can read the full rationale underlying each public concern. Each sample excerpt is linked back to the complete original response using the response identification number listed with the comment.

Public concern statements are not intended to replace actual comment letters or sample quotes. Rather, they can help guide reviewers to comments on the specific topic in which they may be interested. They also make it possible to systematically respond to large numbers of comments because like comments have been grouped together. The full Analysis of Public Comment report and all original response letters in their entirety are in the administrative record at the Supervisor's Office in Rolla, MO.

It is important to note that during the process of identifying concerns, all comments have been treated equally—they are not weighted by organizational affiliation or status of respondents, and it does not matter if an idea was expressed by thousands of people or a single person. Emphasis is placed on the content of a comment rather than who wrote it or the number of people who agree with it. Relative depth of feeling and interest among the public can serve to provide a general context for decision-making. However, it is the appropriateness, specificity, and factual accuracy of each comment that provides the basis for modifications to planning documents and decisions.

Therefore, consideration of public comment is not a vote-counting process in which the outcome is determined by the majority opinion. The National Environmental Policy Act (NEPA) encourages all interested parties to submit comment as often as they wish regardless of age, citizenship, or eligibility to vote. Respondents may include businesses, people from other countries, children, and people who submit multiple responses. Analysts did not attempt to tabulate the exact number of people in favor of or opposed to any given aspect of the draft forest plan and DEIS.

The narrative report below does include very general indications of the strength of public feeling found in the comment database for informational purposes. However, these comparatives must be taken as more qualitative than quantitative in nature. Although these qualifiers give a general sense of public sentiment, they should be interpreted with caution—those who responded do not constitute a valid random or representative sample of the general public.

The final Analysis of Public Comment report developed by American Consultants LC is a summary document. As such, it is not intended to replace the need for interdisciplinary team members and decision-makers to directly review all responses and comments. Database reports by topic area allow systematic review of all public responses by subject area. Given the rapidly expanding volume of responses during comment periods due in part to increasing public interest in public lands management issues and the widespread use of e-mail, this process can greatly enhance methodical review of comments and meet our goal to continually improve decision-making and responsiveness to the public. For more information on the content analysis process, the reader may contact the Forest Service Content Analysis Team in Salt Lake City, Utah.

Narrative Summary of Public Comment prepared by American Consultants LC

During the comment period, February 4, 2005 to May 5, 2005, the Mark Twain National Forest received 1,807 responses—including letters, emails, and faxes—approximately 462 of which contain original comments. A total of 2,430 individual comments were coded and attributed to 336 public concerns. Of those, 1,278 responses are form letters, defined as five or more letters of identical text submitted by different people. One example of each form type is coded and entered into the database to ensure that the concerns are considered. The rest of the forms are sorted by form type, and the total number of each is recorded in the database. The analysis provided in this document is based on the 462 original responses and the one example of each form letter. The remaining 67 responses account for 61 duplicate letters, 2 outside the scope responses, and 4 responses referenced as attachments.

Prominent Themes in Public Comments

Rather than being comprehensive, the following summary is intended to provide an overview of prominent concerns.

Process and Planning

The Revision Process General

Respondents questioned the exclusion of issues regarding management direction of the forest, stating, “All issues affecting the management direction of the forest should be fully addressed in this Forest Plan process.” Other respondents express support for the plan stating that it is, “a well thought-out and written Forest Plan.” They also state that “the opportunity to provide comments and recommendations related to the draft Forest Plan is appreciated.”

Some respondents felt that the process started with a Plan, rather than fully involving the public in the development of alternatives, i.e. “because the planning process should end with a plan not start with it”.

A number of respondents request that the Forest Service emphasize restoration of natural ecosystems and ecosystem processes while others prefer less focus on ecosystem management. Respondents also request that the Forest Service provide more balance in their approach to the concepts of multiple use requesting that the Forest Service, “manage the MTNF in a manner that will accomplish multiple-use resource objectives and meet the needs of agriculture producers, private landowners, the forest products industry, local communities and the citizens of the state.”

Revision Documents and Use of Science

Some respondents offer positive feedback for the Draft EIS suggesting that it is “well organized and easy to understand.” Other respondents request revisions be made to the Draft Forest Plan including correction of errors and improving the quality of maps. Other comments ask the forest address specific inadequacies of the Draft EIS, while one respondent requests a supplemental EIS be prepared.

A number of respondents note that sound science is the basis for good decisions and that standards and guidelines for research, monitoring, and evaluation should be reviewed. In one letter, a respondent emphasizes the need to clarify the role of monitoring in adaptive management.

Public Involvement

Some respondents note the general importance of public input, while one respondent requests that the forest specify how many people agree and disagree with the Forest Service to avoid bias. Others request that the forest coordinate with other groups and agencies on the plan, including state and local governments, residents, and local industry, because of potential impacts to local communities. Another respondent suggests that a presentation of the basics of the new plan at the beginning of public meetings would have been helpful because of difficulties in understanding the document.

Respondents also suggest that additional public involvement and education would help reduce misunderstandings and hostility that develops around potentially emotional issues. Other comments warn against excessive influence by special interest groups and stress the need to make information available to the public, such as biological assessments.

Agency Staffing

Respondents suggest that the forest should provide more personnel to interact with the public in order to provide a positive influence and better public relations, including a positive effect on children and reduced vandalism, forest fires, poaching, theft, and illegal ATV use. Respondents also request the need for forest personnel to educate the public about the uses and benefits of the forest.

Alternatives and Management Prescriptions

Respondents request that a reasonable range of alternatives be developed including a comparison of alternatives because current alternatives are not felt to be capturing sufficient variability associated with timber harvest, recreational demand, mining, and other management actions. These respondents express concern that a decision cannot be made before the process is complete. At least one new alternative is proposed in response to perceptions that current alternatives do not offer sufficient variability. Respondents also suggest that the forest provide a more scientific basis for alternative selection.

Some respondents support the preferred alternative (i.e., Alternative 3) because of its increase in ecosystem management and prescribed burns. Some also suggest that it provides the best balance between restoration of natural communities and production of traditional forest commodities. Other respondents oppose the preferred alternative because of negative effects on wildlife, decreased timber harvest, excessive economic impacts, and inability to improve forest health.

Some respondents request that Alternative 1 be chosen as the preferred alternative "because it offers an opportunity for restoration on a more cautionary and sensitive scale" and improves forest health. Opposition to Alternative 1 includes concerns about limited timber harvest and uncertainty about restoration of "natural" communities.

Some support Alternative 2 because it focuses on restoration while others oppose Alternative 2 for the same reasons and due to a desire for sustained timber harvests. In some cases, support for Alternative 2, as well as other alternatives, is supplemented with caveats for specific management changes.

Support for and opposition to Alternative 4 is based on arguments about advantages and disadvantages respectively of forest management over ecosystem restoration. One comment states that restoration will occur at a "more measured and proportional rate" under Alternative 4, while another notes that too little land would be allocated to restoration.

Respondents that support Alternative 5 suggest that "continued use of the 1986 plan will ensure the best mix of timber production, recreation, wildlife management and protection of sensitive areas and plant and animal species." Proponents for Alternative 5 note that it provides for "sensible levels of economic and social maintenance" and is the best alternative given available data. Some respondents however are concerned that the existing plan (i.e., Alternative 5) does not offer enough natural community restoration.

Some respondents request clear standards and guidelines for each management prescription. A number of requests provide differing viewpoints about whether or not more guidelines should be standards, or more standards should be guidelines. Some comments argue that guidelines provide more flexibility and allow forest producers to use more judgment when applying management practices, while others feel that standards provide greater control and insure compliance with NFMA.

A number of comments request changes to standards and guidelines associated with specific management prescriptions, or resources.

Natural Resource and Forest Management

Natural Resources General

Some respondents express the need to allow more resource production on the forest. Other respondents suggest that restoration of the forest is a necessary focus. Preservation of rural economies and local culture are examples of rationale given by proponents of production, while protection of wildlife and rare species, forest health, and forest sustainability are examples of justification for restoration and forest regeneration.

Forest Management General

Some respondents suggest that an active management approach is the best way to manage the forest. Some request that the forest allow for more resource production within the forest, noting that forests are meant for multiple-use, while others request the need for a conservative approach. A number of respondents commented on whether or not ecosystem management should be used on the forest. One respondent opposed to ecosystem management suggests that, “historical information from one time period should not be used as a reference for present or future conditions.” Those in support of ecosystem management argue that it is “an appropriate step in creating healthy ecosystems.”

Some respondents express the need to address the health of the forest in a timely manner and consider biodiversity as the best indicator of long-term forest health. Other respondents request that greater attention be paid to stand structure, stand age, and regeneration.

Illegal Activities and Enforcement

A number of respondents express concern about a variety of illegal activities, such as dumping and littering in the Mark Twain. One respondent requests that the Forest Service change its guidelines regarding clauses controlling the use of hazardous materials in leases, contracts, and permits for occupancy into standards.

Other respondents recommend enforcement of laws prohibiting illegal activities instead of closing roads and areas, more consistency in law enforcement polices, and greater use of unmarked vehicles at campgrounds. Some suggest that an analysis of correlations between new roads and illegal activity should be completed.

Fire Management

A number of respondents request that the forest reconsider the use of fire on the forest. Particular concerns include the effects that periodic burns will have on vegetative material and the organic layer of the soil, private property damages, and the need for restitution, and discrepancies in existing literature regarding the effects of prescribed fire. Some respondents are opposed to increased use of fire as a management tool, while others are concerned with prescribed fire under specific conditions. Other respondents support the use of prescribed fire to achieve various objectives, including improved wildlife habitat and reduction of wildfire hazards.

Some respondents suggest that the forest review federal regulations, policy, and guidance regarding fire and prescribed fire management. One comment suggests that fire alone cannot restore natural communities, and claims that fire is not the only element affecting natural communities. Some respondents suggest using prescribed burns in place of clear-cutting for restoration and to attain favored habitats. A number of comments ask for specific changes to standards and guidelines for applying prescribed fire.

Management Areas

Some respondents request that additional lands be considered for designation as wilderness areas stating that, “limited human contact in these areas will help insure our national forest will thrive and that any ecological restoration and/or preservation will not be destroyed or disturbed.” In contrast, other respondents oppose wilderness designations suggesting that it “restricts the use of the forest, by the public.”

Some respondents comment on how wilderness areas should be managed. Some also suggest that, “the Forest Service should manage the areas that have been recognized to have the potential to be added to the National Wilderness Preservation System so that they may be so designated by Congress.” Preservation of Lower Rock Creek is discussed in a number of comments. Related comments suggest that the “roadless quality of areas evaluated for roadless conditions should be maintained.”

Some respondents applaud the extension of the 16 miles of the Black River as a Wild and Scenic River but request that the Forest Service reconsider the rivers that were withdrawn from Wild and Scenic River eligibility. One respondent specifically requests a discussion of the criteria and ramifications of Outstanding National Resource rivers designations.

Land Use

Comments regarding land use include requests to increase land designations, opposition to additional land acquisitions, and requests to change standards and guidelines for special uses as well as land acquisitions and exchanges.

Some respondents urge the Forest Service to seek out federal money for the acquisition of lands and to “work closely with non-profit land protection organizations and state agencies to coordinate land acquisition and protection strategies.” One respondent suggests that land used legitimately by the forest should be leased, not purchased, accepted as a donation or trade, or otherwise acquired in fee. However, another respondent suggests that the forest should seek to buy land and not trade it. Some respondents suggest the need to acquire land to provide buffers and corridors that will protect sensitive habitat as well as the need to acquire and exchange tracts based on analysis that emphasizes the protection and long-term viability of ecosystems.

Comments also request the prohibition of land exchanges because respondents think they encourage further lead mining and the need to acquire and exchange tracts based on analysis that emphasizes the protection and long-term viability of ecosystems.

Timber Resources

Respondents express both support and concerns for timber harvest on public lands. Those who support timber harvest do so because of the jobs it provides and its monetary contribution to the state economy. Some suggest that timber harvest helps to reduce beetle infestations and fuel hazards and contributes to overall forest health. Other respondents suggest that there should be no reduction in the Allowable Sale Quantity (ASQ) while others argue for an increase. Different market-based analysis to inform decisions regarding harvest goals is also recommended.

Those in favor of maintaining or increasing the ASQ cite, among other things, economic benefits, capacity to utilize small diameter trees, capacity to harvest dead or dying trees, need to comply with laws specifying balanced uses, and fuels reduction. Respondents opposed to timber harvest suggest that it should be eliminated or reduced because of its negative effects on tourism, wildlife, recreation and other environmental aspects of the forest. Some request that it be reduced in order to recognize other uses of the forest.

A number of respondents request that even-aged timber harvest be reduced and that the forest use more uneven-aged timber harvest practices. Comments include requests for the forest to avoid premature "clear-cuts" next to past "clear-cuts", prohibit "clear-cuts" under particular circumstances, or eliminate even-aged timber harvest all together. Comments also cite public resentment of visual impacts associated with clear-cuts and the need to avoid past mis-management associated with large clear-cuts. Some respondents ask that even-aged management be used only for restoration. In some cases, the forest is requested to follow the timber harvest practices of Pioneer Forest.

Some respondents suggest that the forest should conduct more even-aged timber harvest for restoration purposes as well as for management of oak-hickory forests. Many comments debate the relationship between timber management practices and declines in oak-hickory stands. Some argue that decreases in even-aged management will inhibit regeneration of oak-hickory with subsequent adverse impacts to wildlife and forest sustainability; others claim that uneven-aged management "creates longer-lasting early successional habitat" that better represents natural conditions. Some comments suggest that oak decline is not a valid justification for salvage harvests, while contrasting viewpoints claim that additional harvest is needed to address the oak-decline situation.

Respondents also request that the forest address the need for salvage timber harvest and clarify whether or not it would count towards the specified limits. Other comments ask that the forest consider the impacts of timber harvest on surrounding regional, private, and public lands. Others request that private land owners abide by the same the rules the forest follows. Some request that the forest address the impacts of public and private lands timber harvesting on wildlife and non-timber forest products. Respondents also request a need for the analysis of the benefits of non-timber forest products including the "traditional and continuing use by local families for food, medicine, and income."

Vegetation and Restoration

Respondents' concerns not only relate to restoration of forests but to habitat protection, native species, pesticide use, and old growth. A number of respondents request the need to sustain oak and pine forests in regards to vegetation management. Some respondents find mixtures of oak, hickory, and pine desirable and propose even-aged management as the preferred method for sustaining oak-hickory conditions. In contrast, another respondent requests a "better mix of white oak and pine" by avoiding even-aged management and overstocking of black and scarlet oak. A number of comments express concern about replacement of hardwoods by pine, due in part to adverse impacts to wildlife.

Some respondents request the need to continue to focus on natural community restoration including clear criteria for restoration, while others offer specific recommendations for implementing restoration, such as reconsidering the use of pine for reforestation. Some support restoration but wish to see reduced use of timber harvest, in contrast to those who feel that timber harvest is an appropriate tool for restoration.

Some respondents favor more protection and designation of old growth because of the diversity of habitats it provides. Those resisting old growth designation are opposed to implicit harvest reductions and claim that renewal of old growth is costly. Some suggest delaying old growth designation until a reasonable plan for the long term management of old growth areas is established.

A number of comments question target conditions associated with restoration, including pre-settlement conditions, citing insufficient evidence that target conditions are desirable, achievable, or accurate. Other comments support efforts to restore pre-settlement conditions.

Respondents request that the forest maintain native species in the forest including taking an "aggressive stand on exotic species introduction and proliferation in the Mark Twain." Some respondents suggest that the forest should only use native species for restoration work. Many of these respondents are also opposed to the use of chemical herbicides and pesticides for control of non-native invasive species and request that the forest address the effects of such pesticide use on wildlife. One respondent suggests using sugar water application as an alternative to pesticides.

Mineral Resources

Respondents express both support and opposition to minerals exploration and development. Those opposed cite concern regarding the polluting effects of mining on the forest. Related comments request that the Forest Service complete a comprehensive study of the effects of mining before making a decision about mining exploration and extraction in the forest. Other comments ask that resources be used to reduce or eliminate the sources of pollution from past mining in the forest.

Some respondents request that mining be prohibited in the forest. Some respondents request that mining be prohibited, or that mining not be allowed in locations such as the Irish Wilderness and Eleven Point River area. Others request the Forest Service consider that Doe Run's lead mining is contrary to the Multiple Use Sustained Yield Act of 1960, 16 USC Sec. 59. Other respondents suggest that new mining facilities should be prohibited from releasing toxic materials into the air, water, or karst formations.

Respondents in favor of mining stress that it should be allowed on all lands where companies have interest. Some respondents suggest that the forest does not have the authority to reject leases once the determination of a "valuable deposit" has been made.

Many respondents express concern with the forest's decision to eliminate mining from the scope of issues to be addressed.

Rangeland Resources

Respondents request the need to review standards and guidelines regarding livestock management. Some respondents request that grazing be prohibited, especially in Riparian Management Zones. Others express concern regarding the impacts of grazing on water quality, watershed, and streambank features and recommend buffers for grazing near areas that will impact water resources.

Some respondents suggest that grazing has a positive effect on forests by helping to spread native species and providing vegetation for wildlife. Others also suggest that native ungulates such as Bison and Wapiti should be used and that cattle and horses should gradually be phased out.

Comments also include requests to further assess the impacts of grazing.

Air Quality

Some respondents express concerns regarding cumulative impacts of land use on air quality and climate. Respondents request that the forest address the impacts that global warming will have on the ecosystem of the forest.

Two respondents expressed concerns about the proposed increase in prescribed burning and its potential effects to air quality, particularly as it affects human health, and sensitive receptors (i.e. Class I airsheds, major cities, and sensitive populations). These respondents encouraged the Forest Service to coordinate with other state and federal regulatory agencies to evaluate individual prescribed burns and take actions to reduce the amount of particulates

released, to inform the public of proposed burns, and to coordinate prescribed burn timing with other agencies undertaking prescribed burns in order to minimize cumulative impacts.

Water Resources

Respondents request protection for waters in the forest including protection and restoration of watersheds, streams and rivers, springs, seeps, fens, sinkholes, and shrub swamps. Some request coordination with the United States Geological Survey for water studies and recognition of hydrologic ties, particularly between karst surface features and subsurface waters regardless of surface ownership.

A number of respondents express the need for protection of Watercourse Protection Zones and Riparian Management Zones. Some request the need for larger buffer zones, an increase in acreage of the zones, and elimination of activities such as timber harvest in WPZs. Others requested reconsidering the prohibition on development of new recreation facilities in the Riparian Management Zones.

Some comments discuss the need to comply with programs including 303(d) listed waters, outstanding natural resource waters (ONRWs), and permit and certification requirements managed by the Corps of Engineers. Additional comments request changes to specific standards and guidelines for streams and rivers and recommend improved assessments of hydrologic connections between sensitive aquifers.

Soils and Geology

Some respondents express concern regarding the effects of forest management on soils and soil productivity. Respondents request clarification regarding soil productivity as well as an established level of soil loss based on location and soil type for timber harvesting roads and paths. Others request clarification regarding information on high compaction potential soils.

Respondents also request increased management of geology including caves and karst resources. One respondent requests that, “a well-designed program of dye-tracing and karst watershed delineation” be implemented.

Fisheries and Wildlife

Respondents request protection of aquatic species including consultation with the Missouri Department of Conservation, and consideration of standards regarding trout occurrence. Other respondents request small, fishless pools for amphibian breeding populations.

Some respondents suggest that a “species-specific management plan for all species at risk should be developed and monitored for effectiveness.” Some request that the Forest Service provide scientific evidence that the alternatives meet the viability needs of wildlife and plants. Respondents also request that various habitat types be provided for multiple forest species, as well as including more species on the list of Management Indicator Species.

A number of respondents request protection of Threatened, Endangered, and Sensitive species including compliance with the Endangered Species Act in regards to forest management. Some request that a biological assessment be conducted for federally listed species.

A number of respondents stress the need to recognize correlations between vegetation or timber composition and wildlife (see comments regarding Timber Management), while other respondents suggest that forest management activities should not be restricted based on unsubstantiated claims of the effects on forest species.

Transportation and Recreation

Transportation System Management

Many respondents request that the Forest Service review standards and guidelines for transportation management and trails. Some respondents express concern about the impact of roads on wildlife and suggest an analysis be conducted. Others recommend that the Forest Service develop an "ecosystem impact" rating system for the different modes of access in different areas of the forest. Respondents also request that the Forest Service clarify its documentation regarding trails, improve enforcement of access restrictions or prohibit new roads for motorized vehicles, and remove or decommission roads with water crossings and high erosion potential. One respondent suggests reductions in road density because the maintenance backlog is too large.

Respondents in favor of improved road access cite the public's right to access, including off-road vehicles, increasing demand for motorized recreation, and beneficial economic impacts. They also note that roads provide access for disabled individuals, as well as for fire, disease and pest control. Respondents express support for road and trail maintenance. Others suggest adequate maintenance for an expanded trail system.

Recreation Management

Many respondents express support and concern regarding recreation in the forest. Some suggest the Forest Service change standards and guidelines regarding recreation management, including clarification of dispersed and developed recreation uses in the context of the recreation opportunity. Others request consideration of non-traditional forest users such as mountain bikers, equestrian riders, rock climbers, and spelunkers. Respondents also express the need for campground maintenance especially campgrounds with historical significance and increased hiking opportunities including lengthy trails and short loops.

Many respondents express concern about motorized vehicle use in the forest. Some request off-road vehicles to be eliminated from the forest all together, while others suggest that off-road vehicles be confined to areas where all other resources may be expendable. Others ask that the Forest Service enforce the use of noise reducing mufflers, and maintain a 'closed' unless marked 'open' policy. Many proponents of OHV access recommend changing to an 'open' unless posted 'closed' policy.

Many respondents view the use of motorized vehicles as a legitimate use of national forests. Those respondents also suggest the continuation of the off-road study. Others request that off-road vehicles and horse trails should be placed in areas that have no fragile ecosystems. Some respondents request that a list of "off-road" trails be posted on the Mark Twain Web Site. Some respondents also encourage the Forest Service to consider the time and effort of the "off-road" community in efforts to clean and mark trials when access is being considered.

Some respondents request that that no new recreation facilities be built in Riparian Management Zones, while others ask for the construction of new recreation facilities and opportunities in Riparian Management Zones.

Respondents express concern regarding the Recreational Access Tax (RAT) and recommend that it be eliminated because it is an intrusion on personal freedom. Some suggest fees be collected from developed campgrounds and not through expansion of "user" fees. Some respondents suggest establishing a permit or fee-based system for off-road vehicles to cover expenses.

Social, Economic, and Heritage Resources

Many respondents express concern regarding the economic values of the forest, with some emphasizing that forest protection is necessary for the overall benefit of the forest as well as for the enjoyment of future generations. Some suggest that the Forest Service review standards and guidelines regarding Heritage Resources, including not publishing where they are located. Others request the Forest Service to ensure that if any items under the Native American Graves Protection and Repatriation Act (NAGPRA) are uncovered during construction, the construction should stop immediately, and that state and tribal NAGPRA representatives be contacted, including the Eastern Shawnee Tribe.

Some feel that the economic analysis is inadequate because it ignores how much money is lost harvesting timber from the forest. Some request reconsideration of Missouri Department of Conservation timber prices and other market conditions when developing timber management goals. One respondent requests redirection of money lost on the timber sale program to employ local individuals in non-commercial restoration activities. Others suggest replacing Payment in Lieu of Taxes (PILT) with a new policy.

Respondents also request the Forest Service consider social values such as visual management. One respondent suggests that there is a need to add a goal to "achieve high quality scenic values."

Conclusion

In summary, respondents provide a number of comments related to the planning and revision process itself as well as all aspects of forest and resource management. The most frequently discussed topics include timber management (including timber harvest versus ecosystem restoration), recreational access and off-road vehicle use, mineral management, and protection of wildlife and water; these topics are similar to topics raised by the public at the time of the Notice of Intent.

In many cases, respondents are interested in a forest plan that will provide a balance between the environment and resource production. Comments on Alternatives 1, 4, and 5 most often emphasize resource production and access while comments on Alternatives 2 and 3 emphasize restoration and increased use of ecosystem management.

While respondents express a wide range of views, many express a consistent desire to see the forest maintained and preserved in a healthy state. What divides them is a difference in perspective on what is needed to preserve that state and what the long-term state should be. These perspectives inform decision-makers of respondents' concerns and values on virtually every topic, and reflect, as well, the serious consideration respondents give to management of the Mark Twain National Forest.

Agency Response to Public Comments

Public concern statements form the basic summary of public comment, and they were used by the interdisciplinary team in considering and responding to public comments. It should be noted, however, that the interdisciplinary team reviewed not just the Public Concern statements, but all comments attached to each PC#statement as well.

Once the comments have been exhaustively reviewed and the range of concerns identified, the interdisciplinary team members, who are responsible for the next stage of comment consideration, issue identification, and response to comment, reviews the list of Public Concerns. At this stage, interdisciplinary team members determine whether comments are

substantive and in scope, consult with the leadership team, and arrive at decisions about whether changes will be made to forest plan direction, alternatives, supporting analysis, or other plan elements. Finally, team members compose responses to comments, and changes are also incorporated into the final forest plan and FEIS as appropriate.

Based on the Council of Environmental Quality's regulations, a substantive comment is one that falls within the scope of decision-making for the plan and:

- Questions, with a reasonable basis, the accuracy of the information in the environmental impact statement;
- Questions, with a reasonable basis, the adequacy of environmental analysis as presented;
- Presents reasonable alternatives other than those presented in the DEIS that meet the purpose and need of the proposed action and address significant issues; or
- Cause changes or revisions in the proposal.

Generally, the types of comments that are considered out of scope include those that:

- Do not address the purpose, need, or goals of the Mark Twain National Forest Plan Revision (e.g. propose an action in areas beyond Mark Twain National Forest jurisdiction or that are not directly related to the action proposed in the plan, or relate to day-to-day operational issues such as law enforcement procedures or road maintenance);
- Address concerns that are already decided by federal law or national policy;
- Suggest an action not appropriate for the current level of planning (site-specific decisions to construct new roads, campgrounds or facilities, to offer special use permits or the sale of timber resources);
- Propose untenable restrictions on management of the forest or conflict with approved plans not being revised in the forest plan revision process;
- Did not consider reasonable and foreseeable negative consequences; or
- Point to only minor editorial corrections.

Non-substantive comments, or concerns identified from them, include those that are outside the scope of the decision-making for the Forest Plan, simply state a position in favor of or against and alternative, merely agree or disagree with Forest Service policy, or otherwise express an unsupported personal preference or opinion.

The National Environmental Policy Act requires that after we consider comments, we formally respond to substantive comments. We are required to respond only to substantive comments or the concerns identified from them. However, to fully inform the public and to use this process as an educational tool, we has chosen to respond to all public concerns identified during analysis of public comment, within and out of scope, substantive and non-substantive alike. Responses to out of scope concerns are generally restricted to describing why the concern is out of scope and does not merit further attention. A more elaborate answer may have been provided for clarity. Responses to substantive concerns are typically more extensive, complete, and most importantly, offer an explanation of why or why not and where the concern may have resulted in changes to the plan or analysis. Public concerns that identified editorial or other errors in the presentation of information in the DEIS were used to revise text and make corrections for the FEIS. The editorial concerns identified by the public are not included in the narrative response to comment.

Public Concerns were grouped by General Themes and Themes in order facilitate the response process, and to aid in review of the comments and responses. The General Themes generally follow the major areas of analysis in the FEIS, and the Themes further group Public Concerns that are closely related.

An ID number identifies each Public Concern (PC). With these ID numbers, PCs in this document can be correlated with the Analysis of Public Comment document and the comment database prepared by American Consultants LC. Each public concern is individually numbered, but the numbering system is not sequential throughout. **This is not an error** but occurred as individual concern statements were reorganized into General Themes and Themes. In addition, some numbers within the overall range may not appear at all. Again, **this is not an error**, and does not indicate that some PCs are missing. Rather, numbers may have been eliminated during the content analysis process as the PCs were further refined.

Some PCs include subconcerns, which are identified by A, B, C, etc. Responses follow each PC, and may include individual responses for some or all of the subconcerns. In some cases, there may be one response for several Public Concerns that are similar in content.

General Theme 1 – Planning Process

Theme 1.1 - Range of Alternatives

PC# 96 - The Mark Twain National Forest should develop a more complete range of alternatives.

PC#96 - The Forest Service believes that the range of alternatives is adequate and expresses a full range of possible management emphases for the Mark Twain National Forest. We respectfully disagree with those commenters who do not feel the range is adequate, or who believe the process used to develop alternatives is flawed. Appendix A of the Draft EIS describes the public involvement process used to guide the identification of issues and development of alternatives. Many of the suggested alternatives have already been analyzed in the Draft EIS, and many of the suggestions for changes in alternatives are encompassed in one of the existing alternatives that were analyzed in the Draft EIS.

NEPA requires that a broad range of reasonable alternatives be considered, but does not mandate that any particular alternative be selected. An agency's discussion of alternatives must be bounded by some notion of feasibility. There is no requirement to consider alternatives that are impractical or infeasible. Guidance from the Council on Environmental Quality (46 Fed. Reg. 18026 (1981)) and many courts have stated that the range of alternatives is bounded by the purpose of the proposed action. As one Judge noted, when the purpose of a proposed action is to accomplish one thing, it makes no sense to consider alternative ways of doing by which another thing may be accomplished. NEPA does not require agencies to consider alternatives that are inconsistent with the basic policy objectives for the management of the area. Nor is there any requirement in NEPA that an EIS discuss a minimum number of alternatives. The Forest is required to set forth only those alternatives necessary to make a reasoned choice.

A) Because the preferred alternative does not offer a true compromise between restoration and production.

PC#96 A - The preferred alternative is not intended to be a "compromise" between resources. It was developed to restore high quality areas of natural diversity and provide traditional forest commodities (FEIS page 2-11).

NEPA does not require that alternatives in a programmatic document "compromise" between alternatives. NEPA merely requires the agency to examine a reasonable range of alternatives to accomplish the proposed action. We agree that there a trade-offs involved in resource management, but did not intend for the preferred alternative to be a compromise between alternative demands for use of the Forest

B) Because Alternative 1 is not given consideration.

PC#96 B - Alternative 1 is given the same consideration as Alternatives 2 through 5 throughout the EIS. In particular, see the Comparison of Alternatives summary on pages 2-21 through 2-40 of the FEIS.

C) To address mining and prohibition of mining.

PC#96 C - See Response to PC#70 (Theme 24.1.)

D) To address off-road vehicle use.

PC#96 D - In the EIS, an alternative was considered, but eliminated from detailed study to change the off-road, off-trail policy (pages 2-16). An EIS need only briefly discuss the reasons that unselected alternatives were eliminated (40 CFR 1502.14(a)). The 2005 Forest Plan contains standards and guidelines which address ATV's on page 2-24.

E) To address recreation management.

PC#96 E -Recreation has been considered and addressed in the 2005 Forest Plan through standards and guidelines (pages 2-21 through 2-26) and management prescriptions developed specifically to provide a variety of recreational experiences (Management Prescriptions 6.1 and 6.2, pages 3-33 through 3-39), to recognize the unique value of Ozark rivers (Management Prescription 6.3 pages 3-41 through 3-43); to provide developed recreation sites (Management Prescription 7.1 pages 3-45 through 3-47), and to recognize Congressionally designated Wilderness (Management Prescription 5.1 pages 3-13 through 3-32). An alternative to consider recommending all inventoried Roadless Areas as Wilderness Study Areas was considered but eliminated from detail study (FEIS, page 2-15 and 2-16).

F) To address management of threatened and sensitive species.

PC# 96 F - Threatened and endangered species are addressed through Goal 1.4 (2005 Forest Plan page 1-3), standards and guidelines (2005 Forest Plan pages 2-6 through 2-8; 2-11 through 2-14) a Species Viability Evaluation (summarized on pages 3-157 through 3-160 of the FEIS), evaluation of potential impacts to federal species (FEIS pages 3-161 through 3-190), evaluation of potential impacts to state listed species (FEIS page 3-195), and a Biological Assessment (see project file.)

G) To comply with the National Environmental Protection Act.

PC#96 G - The National Environmental Protection Act does not require a certain number of alternatives. It does require that a range of alternatives be considered. The FEIS for the 2005 Forest Plan considers five alternatives in detail (FEIS Chapter 2) and another five alternatives which were eliminated from detailed study (FEIS pages 2-15 through 2-18). Alternatives analyzed in detail range from an emphasis on semi-primitive recreation with no commercial timber harvest (Alternative 1) to an emphasis on providing traditional forest commodities (Alternative 4) to an aggressive program of restoration of natural communities (Alternative 2) to maintaining current management (Alternative 5) to a balance of ecological restoration and production of traditional products (Alternative 3). With the five alternatives considered but not further evaluated, we believe we have considered a full range of alternatives that describe management options for the Forest.

There is no indication from the comment that a specific, viable alternative of interest to the commentor was ignored or overlooked. NEPA simply requires a reasonably broad range of alternatives be considered, and this requirement was met. The Forest is entitled to identify parameters and criteria for alternative development in order to properly focus its analysis on a reasonable range of alternatives at the programmatic level. Without some limits the Forest could generate countless alternatives. This is not what NEPA is intended to accomplish. The EIS for the Revised Plan considered a total of ten alternatives, a broad array of alternative approaches to accomplishing the proposed action. There is no indication the agency failed to comply with NEPA by ignoring viable alternatives.

H) To address timber harvest.

PC#96 H - Timber harvest is considered throughout the 2005 Forest Plan and FEIS. Revision Topics 1a, 1b, 2a, and 2b deal with issues related to timber management (FEIS pages 1-3 through 1-5 and 2-5 through 2-7). Alternatives were developed to provide a range of commercial timber harvest levels (FEIS pages 2-8 through 2-15). Standards and guidelines for timber management, including harvest, are found on pages 2-27 through 2-32 of the 2005 Forest Plan.

NEPA does not require a separate analysis of alternatives that are not significantly distinguishable from alternatives actually considered, or which have substantially the same consequences. Here the programmatic EIS for the Revised Plan addresses alternatives pertaining to timber harvest appropriate to the level of decision-making.

I) To emphasize uneven-aged management and restoration.

PC#96 I - Restoration and enhancement of natural communities is a primary focus of the 2005 Forest Plan, which is clearly stated in Goal 1.1 on page 1-1 of the 2005 Forest Plan. Uneven age management is also addressed through the guideline on page 2 -27 of the 2005 Forest Plan which states that the decision on what type of harvest system to use will be based on management objectives, natural community types, stand conditions, and silvical characteristics. Uneven-age harvest is further addressed through management prescription specific desired conditions for regeneration openings that encompass the full range of sizes, including those <= 2 acres (group selection openings) (Forest Plan, pages 3-11; 3-33; 3-37).

The Revised Plan incorporates and considers the use of uneven aged management. The programmatic Revised Plan does not dictate particular harvest methods, or authorize harvest in any particular location using any particular method. The use of uneven aged management may be considered as an alternative during site-specific project development.

J) To provide habitat for native species.

PC#96 J - Goal 1.4 of the 2005 Forest Plan clearly states the Forest Service intention to provide the full range of natural habitats necessary to support populations of existing native plant and animal species. Standards and guidelines for wildlife habitat are found on pages 2-6 through 2-15 of the 2005 Forest Plan.

K) To meet their goals in current and projected economic and budgetary environments.

L) To provide better estimates of suitable lands as well as Allowable Sale Quantity calculations that reflect actual market and budget constraints noted in the Draft EIS.

N) Because if the Allowable Sale Quantity is not realistic, but merely theoretical, so then are those management goals and economic impacts in the existing alternatives.

O) Because the Draft EIS is contradictory to the objective for a realistic Allowable Sale Quantity in the need for change.

PC#96 K,L,N,O - As part of the planning process, lands not suited for timber production were identified as required in the National Forest Management Act, Sec.6 e(2) and g(2)(a). This analysis for the Mark Twain uses standards and guidelines that are needed to protect other resources. These acres are the same for all alternatives.

Throughout the 1990's, timber markets, appeals of project decisions, lawsuits, reduced budgets, and national policy changes (New Perspectives, Ecosystem Management, reduce clear cutting, Roadless Area Review, etc.) all played a role in the Mark Twain's declining timber sales program. The capability of the land to produce timber products under the 1986 Plan did not change. The circumstances and rules on how the Plan would be implemented did change. These changes reduced the amount of volume sold, but did not change the biological capability of the land to grow trees.

Modeling is a process that uses the best information and assumptions available at the time on the analysis. Modeling scenarios are used to gain some insight into possible outcomes. All models have limited capabilities. Revising, updating data and re-running the models during a revision of the Forest Plan should provide more insight into the outcomes and conclusions gained form the modeling process.

Demand for timber products is expected to increase in the Ozarks according to the Ozark-Ouachita Highlands Assessment (Report 4, GTR SRS-34 p199-202). The timber scheduling analysis recognizes that demand may increase or decrease based on market condition, but the historic trend is that demand for timber products from all sources and ownerships will continue to increase.

For the 1986 Plan analysis, a demand projection was estimated and applied to the ASQ determination and shown in Table 2-1, Demand vs. Supply Potentials By Resource By Decade, (II-4) and figure 4-1 (page IV-10). The table shows the Mark Twain harvest projection of 79.8 million board feet (MMBF) per year of sawtimber/products in decade 1, increasing to 198.4 MMBF per year in decade 5. The projected ASQ in decade 1 is 105 MMBF and increases to a projected total of 261 MMBF. These increases are derived by putting estimated demand increase into the models and projecting outputs.

ASQ is simply a upper constraint on timber harvest, not a commitment to offer or sell a particular amount of timber over the next decade. The ASQ set in the Revised Plan simply represents a ceiling on timber production and does not mandate that such quantities actually be harvested. Indeed, the decision to offer timber for sale (e.g. when, where, how, and harvest method) is not made in this programmatic document, but during future site-specific environmental analysis with public involvement. Moreover, ASQ does not commit the Forest to achieve average annual ASQ level in any particular year. The setting of ASQ is merely part of a long-term multiple use management framework which assumes that adjustments and unforeseen circumstances may arise over the 10 to 15-year life-span of the Revised Plan.

The current analysis does not use demand in the models. The results are based on the amount of suitable lands, revised yield tables and how the forest would be managed through

management prescription assignment. The results of the modeling are more reflective of the land base and management proposed in each of the alternatives.

NEPA does not require the analysis of any particular number or type of alternatives. NEPA simply requires agencies to analyze a broad range of reasonable alternatives to accomplish the proposed action. NFMA regulations (36 CFR 219.12(e)(1)) specifically state that "[b]udgets shall not be a constraint" during benchmark analysis to define the range of alternatives. Section 219.12(f)(1) requires that "[a]lternatives shall reflect a range of . . . expenditure levels." The Revised Plan sets forth a programmatic framework for future management and explicitly recognizes that budget, climate, social, and other factors may influence future project level decisions. The EIS for the Revised Plan specifically considered range of expenditure levels (See Appendix B, FEIS). The Revised Plan is a dynamic document that may be amended as conditions change.

M) To make clear and public anticipated expenditures and revenue by program area and alternative.

PC#96 M - Pages 3-325 through 3-336 and Appendix B of the FEIS describe the process and evaluation of economic impacts of implementing all Alternatives.

P) Because the forest did not follow proper procedure when developing the alternatives.

PC#96 P - We respectfully disagree with the commenter and believe that all procedures were properly followed when preparing the 2005 Forest Plan and FEIS. There is not indication from the information provided in the comment how the development of alternatives in the EIS was flawed. The Forest worked diligently to involve the public and develop a comprehensive set of "significant" issues (40 CFR 1501.7) during alternative development for the programmatic EIS. The planning process was initiated in 2002 with a series of public meetings to solicit public input regarding changes to be made, issues and concerns, and actions that should be taken (Appendix A, FEIS). Additional public meetings and open houses were held in 2002, 2003, and 2004 in various locations around the state to gather public suggestions and concerns. Forest Service employees also attended several meetings by invitation to discuss the revised Plan and hear public concerns (Appendix A, FEIS). There were also several news releases regarding plan revision published in area newspapers, and information posted on the Mark Twain National Forest website throughout the process. We feel the public had ample opportunity to be involved in developing the 2005 Forest Plan.

Q) Because the forest failed to explore the full range of major commodity and environmental resource uses and values required by the planning process.

PC#96 Q - We respectfully disagree with the commenter. See Response to PC#96 G above.

R) Including alternatives where each stands as a potential plan, complete with its own distinct goals, objectives, standards, guidelines, and management prescriptions, prior to alternative selection.

PC#96 R - In the FEIS, Chapter 2, it clearly states that each alternative is a stand-alone potential plan (page 2-2).

S) Because the forest failed to consider a range and is in violation of National Environmental Protection Act and the National Forest Management Act.

PC#96 S - We respectfully disagree with the commenter. See Response to PC#96 G above.

T) Including an explanation of how requirements under 36 CFR Section 219.12 (f) are met for the range of alternatives.

PC#96 T - According to the 1982 Planning Regulations, "The primary goal of formulating alternatives, besides complying with NEPA procedures, is to provide an adequate basis for identifying the alternative that comes nearest to maximizing net public benefits, consistent with the resource integration and management requirements. . ." (36 CFR 219.12 (f), 1982 Regulations). Section 219.12(f) then lists nine factors to be included in developing the range of alternatives, and in evaluating the effects of the alternatives. We met all of these requirements in the development of the 2005 Forest Plan and this FEIS, as summarized below.

1. "Alternatives shall be distributed between the minimum resource potential and the maximum resource potential to reflect…a range or resource outputs and expenditure levels." (36 CFR 219.12(f)(1), 1982 Regulations.)

Benchmark analysis was conducted "to define the range within which alternatives can be constructed." 36 CFR 219.12(e)(1) (1982 Regulations). Benchmarks estimate the Forest's physical, biological, and technical capabilities to produce goods and services. The alternatives were designed to be within the range defined by the benchmarks while providing integrated management of all resources. More information on the benchmarks can be found in Appendix B of the FEIS.

2. "Alternatives shall be formulated to facilitate analysis of opportunity costs and of resource use and environmental trade-offs among alternatives and between alternatives and benchmarks." 219.12(f)(2) (1982 Regulations).

Alternatives were developed to emphasize different environmental effects and resource uses, Alternative 1 emphasizes little to no resource use, Alternative 2 emphasizes ecosystem restoration, and Alternative 4 emphasizes production of forest products. Alternatives 1 – 5 were analyzed to determine and disclose the effects, including trade-offs among uses and resources. A computer program called SPRECTRUM was used in part for this analysis. SPRECTRUM is a decision support model, developed and supported by the USDA, Forest Service, which can simultaneously analyze trade-offs between many goals, constraints, management activities, timing options and land types, which are necessary to manage a large forest. This analysis is documented in Chapter 3 and Appendix B of the FEIS.

3. "Alternative shall be formulated to facilitate evaluation of the effects on present net value, benefits, and costs of achieving various outputs and [non-monetary] values …" 219.12(f)(3) (1982 Regulations)

The Mark Twain National Forest conducted an extensive and complete analysis of the economic effects of each of the alternatives, including a determination of present net value, benefits and costs of both monetary and non-monetary values. The analysis is documented in Chapter 3 and Appendix B of the FEIS, and in the Record of Decision.

4. "Alternatives shall provide different ways to address and respond to the major public issues, management concerns, and resource opportunities identified during the planning process." 219.12(f)(4) (1982 Regulations)

Because this was a revision of an existing Forest Plan and not a "zero-based" planning effort, the issues and analysis focuses on the need for change topics. Major public issues, management concerns and resource opportunities were further identified through an analysis of the comments received in response to the Notice of Intent. Chapter 1 of the FEIS discusses how the revision topics and issues were determined, and Chapter 2 discusses how Alternatives 1 – 5 respond to each of the revision topics and issues.

5. “Reasonable alternatives which may require a change in existing law or policy to implement shall be formulated if necessary to address a major public issue, management concern, or resource opportunity….” 219.12(f)(5) (1982 Regulations)

We did not find it necessary to develop an alternative requiring a change in law or policy in order to respond to the issues, concerns, or opportunities identified.

6. “At least one alternative shall be developed which responds to and incorporates the RPA Program tentative resource objectives for each forest….” 219.12(f)(6) (1982 Regulations)

The USDA Forest Service has been engaged in developing national renewable resource assessments and in long-term strategic planning since 1974 when the Forest and Rangeland Renewable Resources Planning Act (RPA) was enacted. With the passage of the Government Performance and Results Act of 1993, which required all CFO agencies to prepare strategic plans, the development of Agency strategic plans has been done based on the requirements of both laws. The most recent updates of the RPA Assessment were completed in 1993 and 2000. The last RPA Recommended Program was completed in 1990.

The most recent Forest Service Strategic Plan, in lieu of a RPA Program, was completed in 2004 in accordance with GPRA and language in the Interior and Related Agencies Appropriations Act. Neither the RPA Assessment nor the Forest Service Strategic Plan contains recommended output targets applicable to individual National Forests. The Assessment contains national and regional level analysis of the renewable resource situation, including long-run projections of supply and demand for the various renewable resources. The Strategic Plan contains goals, outcomes, performance measures, and strategies that apply to all Agency programs, including management of the National Forest System; but the Strategic Plan does not establish output targets. While Forest plans should be consistent with the guidance provided in the Strategic Plan and should consider the information provided by the RPA Assessment along with other available and relevant science, neither the Strategic Plan nor the Assessment contain recommended outputs that must be incorporated in Forest plans.

7. “At least on alternative shall reflect the current level of goods and services provided by the unit and the most likely amount of goods and services expected to be provided in the future if current management direction continues. Pursuant to NEPA procedures, this alternative shall be deemed the “no action” alternative.” 219.12(f)(7) (1982 Regulations)

Alternative 5 reflects current management of the Mark Twain NF, and is identified as the No Action alternative in the FEIS.

8. “Each alternative shall represent to the extent practicable the most cost efficient combination of management prescriptions examined that can meet the objectives established in the alternative.” 219.12(f)(8) (1982 Regulations)

We believe that each alternative represents, to the extent practicable, the most cost efficient combination of management prescriptions to meet the objectives of each alternative. See Chapter 3 and Appendix B of the FEIS for further discussion of the economic impacts, efficiency and effects of each of the alternatives.

9. “Each alternative shall state at least – (i) The condition and uses that will result from long-term application…; (ii) The goods and services to be produced, the timing and flow…together with associated costs and benefits; (iii) Resource management standards and guideline; and (iv)The purposes of the management direction proposed.” 219.12(f)(9) (1982 Regulations)

Each of these items is included in the analysis contained in this FEIS.

U) Including an alternative considering recommendation of all Inventoried Roadless Areas mapped in the Roadless Area Conservation Rule Final Environmental Statement as Wilderness Study Areas.

PC#96 U - An alternative to consider recommending all inventoried Roadless Areas as Wilderness Study Areas was considered but eliminated from detailed study (FEIS page 2-15 and 2-16). An EIS need only briefly discuss the reasons that alternatives were eliminated from detailed study, 40 CFR 1502.14(a).

V) Including a difference in management outcomes among the alternatives, and clarification about baseline conditions.

PC#96 V - The difference in management outcomes for alternatives is displayed in summary in Figure 6, and Tables 4 through 16 in Chapter 2 of the FEIS. Additional narrative concerning the difference in alternatives is found throughout Chapter 3 of the FEIS.

W) Including more of a range in amounts of timber harvesting allowed.

Y) Because Alternatives 2, 3, and 4 have similar amounts of harvest activities projected.

PC#96 W, Y - See also response to PC#96H (Theme 1.1). Each alternative does not have to be entirely different in every aspect to be considered a valid alternative. Alternatives were developed to provide different ways of applying management prescriptions across the Forest (FEIS page 2-1). Each alternative responds in a different way to comments and revision topics; and the alternative approach is conveyed by the theme, which emphasizes a particular issue or group of compatible issues. The amount of timber harvested ranges from no commercial timber harvest (Alternative 1) to slightly varying amounts in Alternatives 2 through 5. The purposes of timber harvest are different in each alternative, from emphasizing natural community restoration (Alternative 2) to commodity production (Alternative 4).

Strategic planning looks at the long term results (per direction of NFMA) and effects from planned management actions. The alternatives do vary in the long-term desired condition of the Forest. The fact that the ASQ and projected acres of harvest activities are very similar across all alternatives is a reflection of the current condition of the Forest, and the fact that a large amount of thinning is needed, whether to promote timber management or to restore natural communities. While some who look only at ASQ and projected activities may perceive ‘no difference’ among the alternatives, those who look at the long-term results and effects on other resources see significant differences among the alternatives.

The type of silvicultural system used (even-age or uneven-age management) would not result in drastically different acres harvested. Given 1 million acres of forest, even-aged management based on a 100 rotation would dictate regeneration cutting of 10,000 acres each year to provide a “managed” or regulated forest. Additional thinning harvest would also be done for a possible total of 50,000 acres of harvest each year. Under the uneven-aged system using a 20-year harvest entry schedule, one should harvest 50,000 acres each year to provide a regulated forest. The Forest Plan would utilize both even-age and uneven-age management. Both types of management produce regeneration cuts. The acres of regeneration harvests shown in Table E-3 included both even-aged and uneven-aged harvest methods.

X) Including an alternative to prohibit cows and restore non-native grasslands to native vegetation.

PC#96 X - Range forage management was identified as an issue not needing change. The 2005 Forest Plan includes a standard to emphasize the maintenance and improvement of natural grasslands as the preferred method of providing openland habitat. Rangeland management which includes grazing and haying activity is an appropriate use of National

Forests if conducted within the capability of sustainable ecosystems. The Multiple Use Sustained Yield Act of 1960 and the National Forest Management Act of 1976 include provisions that guide the agency to serve the national interest by supplying renewable resources. The 2005 Forest Plan guides management of the range program so adverse effects to the environment are minimized.

Z) Because the outcomes of the alternatives are all the same.

PC#96 Z - The outcomes of the alternatives are not all the same. A summary of the comparison of alternatives is found on pages 2-21 through 2-40 of the FEIS.

AA) Including an alternative that eliminates off-road vehicles.

PC#96 AA -See Response to PC#96 D above

AB) Including a no commercial harvest alternative.

PC#96 AB - Alternative 1 is a no commercial harvest alternative (FEIS page 2-8 through 2-9). NEPA does not require a separate analysis of alternatives that are not significantly distinguishable from alternatives actually considered, or which have substantially the same consequences. Here the programmatic EIS for the Revised Plan addresses alternatives pertaining to timber harvest appropriate to the level of decision-making.

AC) To protect forest ecosystem restoration of damaged natural communities.

PC#96 AC - Restoration and enhancement of natural communities is a primary focus of the 2005 Forest Plan, which is clearly stated in Goal 1.1 on page 1-1 of the 2005 Forest Plan. In Chapter 3 of the FEIS (pages 3-11 through 3-18), the conceptual framework for ecosystem management, and its application to the Mark Twain National Forest are described. The remainder of Chapter 3 clearly shows the balance of managing the forest while protecting the unique features that make the Ozarks such a special place. Appendix A (Terrestrial Natural Communities) of the 2005 Forest Plan and Appendix D (Sustainability through Ecosystem Restoration) describe how these principles are implemented to achieve on-the-ground results.

AD) Because the planning process should end with a plan not start with it.

PC#96 AD - See Response to PC#354 B (Theme 1.2).

AE) Including rethinking the process used to define plan alternatives.

PC#96 AE - See general response above.

AF) To include alternatives that address global warming, invasive species, biodiversity decline, increased urbanization of rural areas, and the need for environmental education.

PC#96 AF - Global warming is clearly outside the scope of the decisions to be made in a Forest Plan. Non-native species are addressed in the 2005 Forest Plan on pages 1-2 and 2-2. Control and prevention of non-native invasive species is clearly a goal of the Forest Service. The restoration, enhancement, and maintenance of biodiversity on the Forest is a primary emphasis of the 2005 Forest Plan as clearly stated in Goals 1.1, 1.2, 1.3, 1.4, 2.2, 2.4, and 2.11. Standards and guidelines throughout the 2005 Plan address the need to conserve, protect, and manage for the elements and functions of biodiversity that naturally exist in the Ozarks. Increased urbanization of rural areas is addressed in cumulative effects for several resources. The need for environmental education is also outside the decisions made in the Forest Plan.

AG) Including protection of old growth forest and aquatic/riparian habitats.

PC#96 AG - Goal 1.3 (2005 Forest Plan pages 1-2 and 1-3) clearly states the Forest Service intent to protect water quality and riparian habitats. Standards and guidelines for water and soil protection, aquatic habitats and wetlands are found on pages 2-2 through 2-5; 2-10 through 2-11, and 2-13 through 2-14 of the 2005 Forest Plan. Goal 1.4 states the intent to manage natural communities as the primary means of providing habitat, and to provide the range of natural habitats necessary to support populations of existing native plant and animal species. Standards and guidelines for old growth habitat are found on pages 2-7 of the 2005 Forest Plan.

AH) By addressing control of invasive species.

PC#96 AH - Goal 1.2 clearly states the Forest Service intention to prevent, control, or reduce occurrences of non-native invasive species (2005 Forest Plan page 1-2). Standards and guidelines for non-native invasive species are included on page 2-2 of the 2005 Forest Plan.

AI) To accurately reflect market conditions.

PC#96 AI - Economic impacts are disclosed on pages 3-325 through 3-336 and in Appendix B of the FEIS.

AJ) To emphasize primitive recreation.

PC#96 AJ - Alternative 1 was developed to emphasize semi-primitive recreation experiences and to minimize direct human influence (FEIS page 2- 8 and 2-9).

PC# 280 - The Mark Twain National Forest should consider the "Citizens plan for Alternative 6" as a new alternative.
A) Because the current Draft EIS fails to maximize net benefits.
B) Because a reasonable range of alternatives have not been provided.
C) Because the Draft EIS fails to incorporate an adequate analysis of cumulative effects.
D) Because it would enhance local non-timber use of the forest.

PC#280 - We believe that Alternatives 1 through 4 embody most of the principles espoused by the “Citizens’ Call”, and that the EIS has met requirements of law and regulation to disclose potential impacts of the proposed action and alternatives, including those on economics, habitat and viability of threatened, endangered, sensitive and management indicator species, long-term sustainability. Alternative 1, in particular, “was designed to respond to those who want to see passive restoration principles implemented” (FEIS page 2-8). In this alternative, there is no commercial harvest and almost 92% of the Forest is designated as Management Prescription 6.2 emphasizing semi-primitive recreation.

The Forest Service agrees with many of the principles described in the Citizen’s Plan; however, we do not agree with them all. Specifically, the majority of lands administered by MTNF are outside the historic range of variability due to past land uses such as intensive open range overgrazing and fire suppression. Experience in Missouri ecosystems is that active, sometimes aggressive, management is required to restore the structure, species composition, and health of the majority of natural communities. Only a few of the Ozark’s natural communities can be returned to healthy conditions by doing nothing (passive restoration).

PC# 292 - The Mark Twain National Forest should consider guidelines in "A Citizen's Call for Ecological Restoration" when developing the forest plan and provide justification in the response to comment if any guidelines are not used.
A) Because the Forest Service should not be making assumptions about the effects of forest management.

PC#292 - The best available scientific information, as well as experiences and monitoring data from other agencies and organizations presently involved in ecological restoration in Missouri, was used in developing the alternatives. The 2002 Citizens' Call appears not to have received any peer review, nor has it been published (to our knowledge) by any scientific journal. We have given its general, broad views consideration in the formulation of issues and alternatives. We note, however, that the document was not written specifically for unique ecological conditions found presently on the Mark Twain National Forest. Moreover, in the years that have passed since the Citizens' Call was developed, new information and science regarding ecological restoration has emerged. Although Citizens' Call was taken into consideration in the development of the alternatives, we also used and relied more heavily upon recent, published (peer reviewed) scientific information.

Additional information on the incorporation of the general principles espoused in the "Citizen's Call" into development of the 2005 Forest Plan is found in the project file.

Theme 1.2 - Standards and Guidelines

PC# 94 - The Mark Twain National Forest should include clear standards and guidelines for each management prescription.
A) Because vague, broad statements that give no boundaries on agency action do not comply with the requirements of the law.
B) So that the public can have a good idea of what is being planned and enforceable.
C) Because without standards, the plan will invite confusion, misinterpretation, and mistrust.

PC# 94 - We believe that the standards and guidelines as written for each of the nine Management Prescriptions reflect the different direction provided by each (2005 Forest Plan pages 3-3 through 3-64). Each Management Prescription (MP) is defined by a theme, goals, and desired condition that are clearly different from the other MP's. The standards and guidelines for each MP do set clear boundaries and limits on actions that may be taken in those areas. We respectfully disagree with the commenters that feel the existing standards and guidelines are vague and do not provide any boundaries to management. NFMA and its regulations allow for considerable discretion to Forests to draft standards and guidelines to meet local conditions. There is no indication in the information provided in this comment that the Revised Plan standards and guidelines violated NFMA or its regulations.

PC# 141 - The Mark Twain National Forest should revise Standards and Guidelines to ensure they are enforceable.
A) Under the Administrative Procedures Act.
B) And disclose the changes in the Standards and Guidelines between the existing plan and the proposed plan.

PC# 141 - We respectfully disagree with the commentor's assertion that standards and guidelines are unenforceable. Standards and guidelines are a key component of forest planning. NFMA Section 1604 requires that project decisions be consistent with the binding provisions of the land management plans. If a project cannot be conducted within these parameters, they prevent such development from going forward.

As is sometimes the case, it appears that the commentor confuses enforceability with effectiveness. The comment suggests that the standards and guidelines must be judicially

enforceable to be effective. This conclusion is based on the false premise that if binding direction is not judicially enforceable, then the Forest Service will not properly employ the direction to mitigate resource effects.

Chapter 3 of the FEIS discloses the impacts of implementing the 2005 Forest Plan, including Alternative 5, which is the 1986 Forest Plan. Therefore, the comparison that the commenter requests has already been done.

PC# 213 - The Mark Twain National Forest should use more guidelines in the application of management practices instead of mandated standards.
A) Because it takes away the ability to manage forests on a day to day basis.
B) To enable the producers to use more judgment in the application of management practices.
C) To allow flexibility in the timber industry.

PC# 213 - The Standards and Guidelines for the 2005 Forest Plan were crafted with great care to protect the resources of the forest while allowing maximum flexibility for management actions. The standards that the commenter suggests be made guidelines were developed by the ID team, considering a wide variety of factors. After lengthy discussions, the ID team determined that these were more appropriately standards than guidelines. We believe that the combination of standards and guidelines as written provides managers the flexibility to reach the goals and objectives of the Plan, while protecting sensitive resources and ensuring long-term sustainability. NFMA and its regulations allow local Forest line officers considerable discretion in development of Forest Plan direction, including standards and guidelines to meet local conditions. There is no indication of any violation of NFMA or its regulations in the Revised Plan. The standards and guidelines of the Revised Plan provide the line officers with adequate discretion, but balance this with the need to ensure resource protection in a multiple-use context. The Forest's experience in managing the multiple-use resources of the Mark Twain National Forest under the 1986 Plan standards and guidelines was an important part of the development of the Revised Plan. Based on this experience, monitoring, public involvement, and other factors, we determined what changes were needed and what new direction should be developed.

PC# 257 - The Mark Twain National Forest should make guidelines to be requirements.
A) To conform with the NFMA.
B) Because discretionary guidelines are meaningless.

PC#257 - We believe the commenter has misconstrued the wording relating to guidelines. It is not true that guidelines can be ignored. All guidelines must be followed. If they are not, the reason why must be explained in the project level NEPA document and the impacts of those actions must be disclosed. Most guidelines were written that way because the protection they provide is important, but it was recognized there might be instances where the implementation of such mitigations would not be feasible. However, the decision maker must explain and fully examine the impacts of not following the guidance as set forth. There is no specific information provided in the comment with regard to how the guidelines are legally insufficient (i.e. violate NFMA) or will not provide adequate resource protection. The comment intimates or presumes that discretionary guidelines will not be followed. This is speculation or opinion; there is no evidence that the guidelines will not be followed and fully implemented by the Mark Twain National Forest line officers. The guidelines will provide efficacious, efficient resource protection, but allow for adjustment to meet site-specific conditions. The guidelines are an important part of the 2005 Forest Plan, and we are confident that when combined with standards and other plan direction provide an excellent programmatic framework for future site-specific decisions. The 2005 Forest Plan is a

dynamic document; standards, guidelines, and other elements will be changes as necessary to meet changing conditions.

NFMA, 16 U.S.C. Sec. 1604(c), refers to "standards and guidelines," but the only subsequent use of the term "standards" is as a term-of-art referring to a technical requirement for timber stands (Section 1604(m)). A basic principle of the NFMA planning regulations is the "[e]stablishment of quantitative and qualitative standards and guidelines for land and resource planning and management" (1982 version 36 CFR 219.1(12)). The terms "standard" or "guideline" is not defined in the planning regulations (see Section 219.3). The terms only appear in the definition of "management direction:" "A statement of multiple-use and other goals and objectives, the associated management prescriptions, and standards and guidelines for attaining them." (Section 219.3) Likewise, the terms appear infrequently throughout the remainder of the NFMA planning regulation (see, e.g. 219.16 (specific reference to timber utilization standards), 219.27(c)(2) (generic reference to environmental standards), 219.27(a)(10) (specific reference to road construction standards)). Thus, the NFMA regulations (1982) use the terms in different applications but do not precisely specify the meaning of the terms, nor are standards or guidelines required to be expressed in quantifiable terms.

PC# 258 - The Mark Twain National Forest should clarify standards and guidelines.
A) For catastrophic events.
B) To address relationship to additional vegetation management direction in the Forest Service Manual.
C) To allow ecosystem dynamics, patterns, and disturbance processes to occur naturally.
D) To address salvage and safety.

PC#258 - The statement regarding Forest Supervisor approval for catastrophic response has been modified in the 2005 Forest Plan to clarify the intent. We respectfully disagree with commenter regarding the prohibition of salvage. Standards and guidelines for salvage are found on pages 2-29 of the 2005 Forest Plan. The 2005 Forest Plan is adequate to provide a programmatic framework for future site-specific decisions. Additional mitigation and environmental analysis, as appropriate, will be conducted at the project level. The Mark Twain National Forest has a long history – documented in the monitoring data as well as on-the-ground results – in implementing environmentally sensitive, safe, and successful timber salvage operations. Where appropriate, Forest scientists have worked with local officials and the public to develop site-specific projects that benefit or improve resource conditions as well as local communities. The standards and guidelines developed for salvage are based upon this rich experience in addressing local resource conditions.

PC# 264 - The Mark Twain National Forest should consider that when comments request guidelines to be standards, it also intends to request changing words like "may" to "shall".
A) And clarify language regarding conflicts between Management Prescriptions and Standards and Guidelines.

PC#264 - If a guideline is changed to a standard, the wording would also be changed to reflect that.

Commenter is correct that the two statements regarding conflicts in standards and guidelines are not clear. In the 2005 Forest Plan, the statements on pages 2-1 and 3-1 of the Draft Forest Plan have been revised to state that if there are differences between Forest-wide standards and guidelines and Management Prescription guidelines, the management prescription standard or guideline applies. An example of this is rotation ages where the Forest-wide

standard is 70 years for shortleaf pine (2005 Forest Plan page 2-28), except in Management Prescription 1.1 and 1.2 where it is 100 years (2005 Forest Plan pages 3-5 and 3-9).

PC# 301 - The Mark Twain National Forest should change its guidelines regarding Hazardous Materials to standards.
A) Including contracts, leases, and permits for occupancy.

PC#301 - Commenter is correct that this statement should be a standard rather than a guideline. It has been changed in the 2005 Forest Plan.

Theme 1.3 - Objectives

PC# 136 - The Mark Twain National Forest should clarify information and inconsistencies regarding objectives and targets in the revised plan and Draft EIS.
A) Including miles of habitat to be stabilized and areas treated or altered.
B) Including acres of bottomland hardwood forests to be restored or enhanced.
C) Including miles of stream in which large woody debris would be placed.
D) Including Allowable Sale Quantity.
E) To show how targets are developed.

PC#136 A, B, C, E - No specific areas for work or activity are identified in the 2005 Forest Plan, as this is not an appropriate part of the programmatic framework we have developed with the public. The 2005 Forest Plan does not authorize, fund, or carry-out any site-specific action. The objectives were developed by the ID team based on a combination of the desired conditions and past accomplishments in these areas, as well as species habitat needs. Experience in developing projects consistent with the 1986 Forest Plan, as well as learning from the monitoring and evaluation of those projects, was a key part of the formulation of objectives in the 2005 Forest Plan. The actual areas in which this work would be done, as well as the timing, mitigation, method, and other factors, would be developed and identified with public involvement during site-specific planning.

We do not see a discrepancy in the 2005 Forest Plan objective of increasing the proportion of native grass to cool season grass and the description of effects in the FEIS. The 4,000 acres of treatment to reduce woody vegetation on glades would be targeted specifically to those identified as potential Bachman's sparrow habitat, while the 12,600 acres is the projected amount of ecological restoration work that would occur in the plan period. The 4,000 acres would be a subset of the 12,600 acres.

PC#136 D - Goal 1.4 clearly states that the Forest Service supports recovery of Federal and State listed species (which would include any reintroductions proposed by US Fish and Wildlife Service), protection and management of habitat for regionally listed species, and protection and management of habitat for other identified species of concern. Because the Mark Twain National Forest is only a fraction of the land in Missouri, maintaining viable populations of any species is not normally feasible on National Forest lands alone. The Mark Twain National Forest's contribution to sustaining viability of all native species, including those federal or state listed, is to provide the range of natural habitats that is appropriate for those landscapes which occur on National Forest lands. This is the "coarse-filter" approach that is widely considered to be the most effective way of maintaining viable populations of native species.

The MTNF Species Viability Evaluation started with over 1600 plant and vertebrate and invertebrate animal species that could occur on MTNF. An ecosystem level (coarse-filter) approach was used to insure habitat availability for most species, resulting in Forest-wide standards and guidelines. For some species or some habitat components, a species level (fine-filter) approach was needed to insure specific habitat components, resulting in species

specific standards and guidelines. In addition, Management Indicator Species and Management Indicator Communities represent other species, including many of those mentioned by the commenter (FEIS page 3-116).

Theme 1.4 - Location and people involved in planning

PC# 68 - The Mark Twain National Forest should consider that with comments being analyzed in Salt Lake City, it shows a lack of knowledge of local conditions.

PC# 108 - The Mark Twain National Forest should conduct all planning at the Rolla, Missouri office.

PC# 216 - The Mark Twain National Forest should provide names of individuals who are pushing the proposed plan.

PC#68, 108, and 216 - Comments on the Mark Twain National Forest Revised Forest Plan were sent to Salt Lake City to be sorted and coded by a team of specialists in organizing public comments. All of the public comments were read, evaluated, and responded to by the same local ID team that developed the Forest Plan and EIS. Where necessary, other scientists and experts were consulted. Formulation of the Forest Plan and analysis of potential effects as documented in the EIS were conducted by resource experts on the Mark Twain National Forest with an intimate knowledge of local conditions. These specialists included hydrologists, botanists, biologists, ecologists, foresters, engineers, social scientists and silviculturists, who collectively have over 100 years experience working on the Mark Twain National Forest. Many of these local specialists have worked in a variety of positions, some in other public agencies and in other Regions of the Forest Service and bring with them a wealth of knowledge of science, multiple use management, ecological restoration, and planning. All of the key stages of plan development were done locally on the Forest. Chapter 4 of the EIS identifies the preparers of the Forest Plan and EIS. Other Forest Service employees with experience in economic analysis also assisted in preparation of the EIS.

Theme 1.5 - Forest Plan implementation

PC# 370 - The Mark Twain National Forest should allow for more decisions to be made at the project level.
A) To allow for better use of well trained personnel at the local level, who are much more familiar with each individual situation.
B) To allow flexibility to accomplish the best solution on a case-by-case basis.

PC#370 - The Forest Service believes that the 2005 Forest Plan does allow flexibility to make local decisions based on site-specific conditions and concerns, while still providing overall guidance to manage and protect the natural resources for which we are responsible. Well over a decade ago, the Chief of the Forest Service defined the nature of forest plans by identifying the decisions made in a programmatic forest plan in two landmark administrative appeal decision on the Idaho Panhandle and Flathead National Forests (1988). In the 1990s, the courts adopted the Chief's characterization of the nature of forest plans as programmatic framework, analogous to a zoning document. For example, the District Court that reviewed the Idaho Panhandle Forest Plan and Chief's appeal decision in 1990 said, "The plan does not deal with any specific development of those areas which were designated non-wilderness. It does not even propose any future development; it merely allows for the possibility of development in the future." The court recognized that future site-specific actions would be subject to another, discrete decision-making process with NEPA compliance and public involvement. A more detailed discussion of the nature of the plan may be found in the "Overview of Forest Planning" paper at www.fs.fed.us/emc/nfma. The 2005 Forest Plan was developed in this context. It contains goals, objectives, standards and guideline, but does not

authorize or fund any site-specific actions. As the Eighth Circuit has said, the mere existence of a forest plan does not produce an imminent injury in fact. "A forest plan…is a general planning tool. * * * Adoption of the Plan does not effectuate any on-the-ground environmental changes." Sierra Club v. Robertson, 38 F.3d 753,758 (8th Cir. 1994).

PC# 394 - The Mark Twain National Forest should address the impacts of illegal dumping and littering.
A) Including coordination with solid waste management districts.
B) Including recycling programs.
C) By including methods to monitor illegal waste dumping with surveillance cameras funded by fines.

PC# 394 – The Mark Twain National Forest recognizes the problems associated with illegal dumping. We continue to work with local partners, such as the Meramec Regional Planning Commission, to clean up dumpsites. We welcome the invitation to work with the Department of Natural Resources as well. Partnering with others, using recycling programs, distributing informational brochures, and use of surveillance cameras are all activities that do not require Forest Plan direction to implement. We will share this information with the appropriate resource program managers.

PC# 512 - The Mark Twain National Forest should clarify how adaptive management will be achieved through monitoring and other management protocols.
A) By including a diagram of the adaptive management process and actions to be taken per monitoring results in the Final EIS.
B) By including additional details in the Final EIS regarding monitoring plans, planning forums and how adaptive management will be implemented consistent with those inputs, and focused on revision topic goals.
C) By detailing in the monitoring plan, the monitoring and management protocols, thresholds, proposed responses to foreseeable and unforeseeable impacts, and budget and resource needs and availability.

PC#512 - The overall monitoring strategy is found in Chapter 4 of the Forest Plan. This chapter outlines the basic components and legal requirements for forest plan monitoring, along with a framework for implementation and adaptive management principles. It is strategic in scope and does not provide extensive details regarding methodologies, protocols or other technical information. The plan is a companion document to the Environmental Impact Statement.

A Monitoring Guide, discussed in Chapter 4 of the Forest Plan, will be developed and that guide will provide specific information on the methods, protocols and other technical details for monitoring the forest plan. Monitoring is a key component of an adaptive management approach, which is outlined in the Forest Service directives system and therefore not repeated in the plan.

Information on how adaptive management will be implemented and the role of monitoring information in that process is found Forest Service Handbook FSH 1909.12 Chapter 20 at the following link:

http://www.fs.fed.us/emc/nfma/includes/directives/id_fsh_chapter_20_adaptive_planning_process.pdf

Theme 1.6 - Draft EIS inadequate

PC# 311 - The Mark Twain National Forest should improve the quality of the maps.

PC#311 - The maps were developed with enough detail for the deciding officer to make a rational choice between alternatives. This is a programmatic, not site-specific document, and

a different level of detail is appropriate. The supporting narrative in the FEIS also provides a sufficient level of detail for the deciding officer to make a rational decision. NFMA does not require acre-by-acre specificity with regard to mapping and inventories. Neither NFMA nor its regulations prescribe any particular type, scale, or quality of mapping. To the contrary, the Act and its regulations allow considerable discretion and rely upon the technical expertise of local officials with regard to the maps provided with the 2005 Forest Plan. The decision not to develop a map with greater specificity or resolution that the commenter seeks is within the discretion provided to the local interdisciplinary team and decision-maker.

PC# 372 - The Mark Twain National Forest should review the "Environmental Concerns-Insufficient Information," EC-2 rating assigned by the Environmental Protection Agency to the Draft EIS.
A) Regarding Air Quality Impacts.
B) Regarding Cumulative Impacts Analysis.
C) Regarding Adaptive Management.

PC#372 - We have carefully reviewed the "Environmental Concerns – Insufficient Information" rating given the Draft EIS by EPA. The FEIS reflects the clarification and further explanation sought by that agency. In some cases, information in the planning record was brought into the EIS itself to address their concern. The cumulative impact analysis has been strengthened for air quality and forest vegetation. A graphic and more discussion on the Adaptive Management process has been added to the Forest Plan Monitoring chapter. EPA's comments were a valuable part of the review and the FEIS is a better document because of their input and our responses. See also responses to PC# 521 (Theme 1.18), and PC# 512 (Theme 1.5).

Theme 1.7 - Topics not changed

PC# 262 - The Mark Twain National Forest should address the issues that were originally determined to be beyond the scope of analysis, adequately addressed in the current plan, or to be assessed at the project level.
A) Including mining.
B) Including off-road vehicles and enforcement.
C) Including adequate funding.
D) Because the public needs to know how the agency will manage off-road vehicle use.
E) Including collaboration with USGS, BLM, DNR, NPS, EPA, and FWS.
F) Because recent data regarding water and karst formations requires the need for mining to be addressed.
G) And recognize the value of Wild and Scenic rivers.
H) Including aquatic habitat.
I) Including feral hogs.
J) Including deer overpopulation.
K) Including recreation.
L) Including Forest Personnel staffing.
M) Including incidence and effects of illegal and non-compliant activities within the forest.
N) Including timber harvest.

PC#262 - Several commenters suggested that the 2005 Forest Plan and EIS should address issues that were determined to be beyond the scope of the analysis based on the Forest's needs for change analysis, scoping, and other preliminary planning work. At the outset, it is important to note that NFMA and its regulations do not require that particular topics, including those suggest here, must be re-visited during plan revision. Instead, NFMA and it regulations provide Forests with the discretion to determine how best to revise their plan. As

described in the 2005 Forest Plan, an in-depth analysis and comprehensive public participation process was used to determine the initial path for the revision of the 1986 Forest Plan. Based on the information learned at this stage, alternatives were developed. Again, public participation was key, and we consulted with agency planning experts to ensure that the revision process for the 2005 Forest Plan was appropriate, given the forest planning efforts ongoing nation-wide. More than a year after the initial stages of plan revision, a DEIS was made available for 90 days public review. Thus, the key issues addressed in the EIS are the product of a comprehensive analysis and public participation process.

PC#262A and F - See Response to Theme 24.1.

PC#262B and D - The reasons for not considering changes to the management of Off-Road Vehicles (ORVs) can be found on page 2-16 of the FEIS. The 2005 Forest Plan does address off-road vehicle management. Standards on page 2-24 of the Forest Plan, under Off-Road Vehicles (ORVs), clearly state that cross-country or off-road use of forest lands is prohibited, and that ORVs are allowed only on open system roads, on designated motorized trails, and within designated ORV use areas. The 2005 Forest Plan does not prohibit the designation of additional ORV trails or use areas. Neither the Plan nor the Record of Decision approve any additional ORV trails or use areas. A decision to add more off-road vehicle trails is a project level or site-specific decision, while the Forest Plan is a programmatic decision. The difference between the two types of decisions is discussed within the FEIS in Chapter 3, page 3-2 and in the 2005 Forest Plan Preface on page 1.

The ORV study is under the second level of decision making, a site-specific project. It is not an attempt to determine Forestwide direction for management of ORVs. It is an evaluation and analysis of the environmental effects of ORV trails and use in a specific location. Because it is a site-specific proposal, it is appropriate that it be examined in a separate analysis than that used for the programmatic direction found in the Forest Plan. Any decision resulting from the ORV study analysis must be in compliance with Forest Plan direction, or a Forest Plan Amendment would be required.

PC#262C - Forest Plans are not funding documents, but are guidance regarding resource management. Funding decisions are made by Congress and are not within the scope of the decisions to be made in the 2005 Forest Plan.

PC#262E - The Forest Service in Missouri has a long history of cooperative working relationships with other federal, state, and local agencies, including those mentioned by the commenter. We intend to continue those working relationships into the future as we implement the Revised Forest Plan.

PC#262G - The Forest Service does recognize the value of Wild and Scenic Rivers. Management Prescription 6.3 is specifically designed to recognize the unique qualities of rivers that may qualify for these designations (2005 Forest Plan, pages 3-41 through 3-43). Management Prescription 8.1 includes the Congressionally designated Eleven Point National Scenic River.

PC#262H - Aquatic habitat is addressed in the 2005 Forest Plan on pages 2-10 through 2-11. The Mark Twain National Forest approved Amendment #27 to the 1986 Forest Plan in August 2002 that included revised direction for management of fish and aquatic resources.

PC#262I - Feral hogs are considered a non-native invasive species and standards and guidelines dealing with that topic are found on page 2-2 of the 2005 Forest Plan. Potential impacts from feral hogs on Management Indicator Species were addressed on page 3-126 of the FEIS. Additional discussion on effects to species at risk has been added to the FEIS.

PC#262J - We are not aware of any deer overpopulation problems on Mark Twain National Forest lands. However, monitoring of white-tailed deer populations is mentioned in the FEIS on page 3-12 under "Maintenance".

PC#262K - Recreation has been considered and addressed in the 2005 Forest Plan through standards and guidelines (pages 2-21 through 2-24) and management prescriptions developed specifically to provide a variety of recreational experiences (Management Prescriptions 6.1 and 6.2, pages 3-33 through 3-39), to recognize the unique value of Ozark rivers (Management Prescription 6.3, pages 3-41 through 3-43); to provide developed recreation sites (Management Prescription 7.1, pages 3-45 through 3-47), and to recognize Congressionally designated Wilderness (Management Prescription 5.1, pages 3-13 through 3-32). An alternative to consider recommending all inventoried Roadless Areas as Wilderness Study Areas was considered but eliminated from detailed study (FEIS page 2-15 and 2-16).

PC#262L - Personnel decisions are not within the scope of Forest Plan revision.

PC#262M - Law enforcement to address site-specific problems is outside the scope of Forest Plan decisions.

PC#262N - Timber harvest is considered throughout the 2005 Forest Plan and FEIS. Revision Topics 1a, 1b, 2a, and 2b, all deal with issues related to timber management (FEIS pages 1-3 through 1-5,2-5 through 2-7). Alternatives were developed to provide a range of commercial timber harvest levels (FEIS pages 2-8 through 2-15). Standards and guidelines for timber management, including harvest, are found on pages 2-27 through 2-30 of the 2005 Forest Plan.

Theme 1.8 - Management prescriptions

PC# 268 - The Mark Twain National Forest should provide an explanation for management area guidance.
A) Including age class and forest types.

PC#268 –Management prescriptions provide direction to help achieve goals and objectives expressed at the forestwide level. Management prescriptions are applied to geographical units on the ground, which are called Management Areas. Management prescriptions typically apply to more than one management area, in multiple locations, on the Forests. When management prescriptions have guidance such as "Designate old growh on 8-12% of each management area covered by this prescription", the percentage is to be applied to each individual management area covered by that management prescription.

Theme 1.9 - MP 1.1 and 1.2

PC# 269 - The Mark Twain National Forest should change standards and guidelines for Management Prescription 1.1.
A) By making the "Appendix: Restoration" available.
B) By reviewing the possibility of restoring communities to a pre-settlement landscape.
C) By using non-commercial treatments for restoration.
D) By increasing the Visual Quality Objectives for visual management.
E) Including the idea that cows are not natural to the area.
F) Including restoration of native vegetation.
G) By eliminating rotation ages.
H) By prohibiting commercial sales.
I) By harvesting smaller area sizes.
J) By adopting Management Area 1.2 standards for percent of area to be harvested.
K) By using new attached guidelines for restoration.

PC# 269A - The commenter is correct that there is no Appendix Restoration. The proper citation in the FEIS should be Appendix A.

PC# 269 B, F, I - The commenter has recommended changing several standards under Management Prescription 1.1 and 1.2 without any clear rationale or explanation. Thus, we reconsidered each recommended change or comment based on the interdisciplinary team's knowledge and expertise. We disagree with the comment that species present during the pre-European period are no longer here. Beginning in the early 1970's, ecologists and biologists were trained to systematically assess ecological health across the landscape by conducting a series of natural features inventories. These comprehensive county inventories (some 20 listed in Nelson 2005) identified areas of remaining biological integrity by ranking ecological health. These inventories and subsequent conservation assessments determine the degree to which plant and animal species, and terrestrial/aquatic habitats are today threatened. Further, Missouri is one of many Midwestern states with more than 25 years of ecosystem restoration experience. This experience has led to the eventual designation of restored landscapes. Monitoring and research has substantiated that species of conservation concern have increased on these restored landscapes.

PC# 269 C and H - With respect to using non-commercial treatments only, see response to PC#503 (Theme 6.3); comment regarding use of native shortleaf pine seed, see response to PC#332N (Theme 13.6); by eliminating rotation ages, see response to PC#186 (Theme 7.2.) The commenter would like the Forest to adopt Management Area 1.2 standards for percent of area to be harvested as part of Management Area 1.1. The MTNF disagrees. The timber harvest standards for Management Prescription 1.1 are designed to provide flexibility to allow effective management in attaining desired condition for restoring natural communities while protecting the resource. This timber harvest standard for Management Prescription 1.2 is consistent with the same standard under the current plan for lands allocated to MP 6.2.

PC# 269D - Resource specialists believe that the Visual Quality Objectives will adequately protect the visual and aesthetic resources for Management Prescription 1.1 and 1.2.

PC# 269 E - In response to the comment that we should change standards including the idea that cows are natural to the area, the MTNF has substantially changed the standards under range management as indicated under Management Prescriptions 1.1 and 1.2. This includes eventual elimination of grazing on native glades and woodlands. See also responses to PC# 238 and PC# 300 (Theme 15.1).

PC# 269K - to the commenter's reference to new attached guidelines for restoration, the Mark Twain National Forest has reviewed the guidelines. The MTNF believes that the

ecosystem sustainability methodology outlined in the DEIS parallels the intent of the guidelines, adjusted to Midwestern ecology.

PC# 270 - The Mark Twain National Forest should change standards and guidelines for Management Prescription 1.2.
A) By making the "Appendix: Restoration" available.
B) By reviewing the feasibility of restoring communities to a pre-settlement landscape.
C) By using non-commercial treatments for treatment.
D) By increasing the Visual Quality Objectives for visual management.
E) Including the idea that cows are not natural to the area.
F) Including restoration of native vegetation.
G) Including approval of seeding or planting vegetation other than shortleaf pine by a biologist or ecologist.
H) By eliminating rotation ages.
I) By prohibiting commercial sales.
J) By harvesting smaller area sizes.
K) By reducing area for timber harvest to 5 percent or less..
L) By using new attached guidelines for restoration.
M) By eliminating salvage harvests.

PC# 270: See response to PC#269 (Theme 1.9), PC# 60 and 134 (Theme 6.7), and PC#201 (Theme 6.4), regarding elimination of salvage. With respect to the comment allowing a rotation age of 50 years (by scheduling no more than 20% of an individual management area for timber harvest) in Management Prescription 1.2, and further reducing the scheduling to 5%, we do not believe that this would be appropriate. Under the Timber Management standards and guidelines on page 2-27 it is stated: "Use silvicultural systems, harvest methods, and intermediate treatments to move the forest toward the desired condition. Base the decision on which type of systems, methods and treatments to use on a particular site on management objectives, natural community type, stand conditions, and the silvicultural characteristics of the species present or desired." The focus is not on any particular management, nor on whether the MTNF will schedule 20% of the management area every decade; rather, it is on the type of management that would best achieve desired conditions in meeting the goals and objectives for Management Prescription 1.2.

PC# 366 - The Mark Twain National Forest should reconsider the direction of Management Prescriptions 1.1 and 1.2.
A) Because a maximum harvest of 20 percent for all harvest methods is an unreasonably low level.
B) Including construction and maintenance of wildlife ponds for wildlife habitat.
C) Because they are non sustainable and imply large long-term costs.
D) Because the science surrounding the creation of the management prescriptions is not supported by facts within the Draft EIS and supporting documents.
E) Because the Forest Service cannot duplicate many of the factors that maintained the pre-settlement landscape and are outside the Range of Natural Variability for present forest management.
F) Because the Forest Service has no way of evaluating how much present land exists within the Forest that meets the requirements of the two prescriptions.
G) Because there is conflict on how the lands will be managed between the purchase unit impacts for the Salem-Potosi Purchase Unit and of the Fristo Purchase Unit with the Weeks Law used to acquire the two prescriptions.
H) Because it is difficult to evaluate how much closed woodland and forest cover will be converted to open woodland and savanna created by the two prescriptions.
I) And should replace the two prescriptions with Management Prescription 3.4.
J) Because the amount of even-aged management slated for regeneration is not necessary to restore the land to natural conditions.
K) Including creating a lead resource exploration corridor from approximately Bixby to

Midridge to be managed under Management Prescription 2.1.
L) Including allowing maintenance.
M) Because the Management Prescription 1.1 designation may be too restrictive for some types of surface disturbing activities associated with mineral exploration if a reforestation project is started in the Salem-Potosi and Eleven Point units.
N) Because the Management Prescriptions 1.1 and 1.2 do not meet the requirements of sustainability as a premise in the DEIS.

PC#366 A - The commenter states that a maximum of 20% for all harvest methods in MP 1.1 and 1.2 is unreasonably low. The standard limiting harvest to 20% of the management area applies to MP 1.2 only, which totals 4.2% of the entire MTNF. Management Prescription 1.2 represents that portion of the current Forest lands allocated to MP 6.2, which retains this standard from the 1986 Forest Plan. The interdisciplinary team agreed that this small percentage does not justify shifting the Management Prescription emphasis that paralleled the former MP 6.2 allocation.

PC#366 B - See response to PC# 58 (Theme 8.2) regarding construction of wildlife ponds in Management Prescription's 1.1 and 1.2.

PC#366 C - We respectfully disagree with the comment that Management Prescriptions 1.1 and 1.2 are not sustainable. Appendix D of the FEIS (see Ecosystem Restoration Programs and Projects) explains that many federal, state, local governments; private non-profit organizations and conservation individuals have expended reasonable funds toward restoring and managing high integrity ecosystems. Existing hazardous fuels treatments, the timber and wildlife budget, KV funds, partnership grants and other funding sources are available from which to carry out ecosystem restoration work.

PC#366 D and I - The commenter states that "The science surrounding the creation of Management Prescriptions 1.1 and 1.2 is not supported by the facts within the DEIS and supporting documents…. On the same page the DEIS states: "there appears to be no realistic method to replicate the complexity of historical conditions and sustained many of Missouri's natural communities, especially those adapted to fire and natural flooding regimes." The statement in the DEIS as written may be unclear and misinterpreted by the commentor. Its purpose is to indicate that there are no alternative methods that will replicate or duplicate the biophysical effects and functions of fire to restore or maintain natural communities. The FEIS was changed on page D-21 under Management Premise #3 to clarify this point. With respect to the commenter reference to the American Forest definition of sustainable ecosystem and USDA Forest Services Strategic Plan (2000 Revision), the MTNF references the latest USDA Forest Service Strategic Plan (2004-2008 Revision) which states: "The mission of the USDA Forest Service is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations." Further, the 1982 Planning Rule (in which the revised Forest Plan was developed under) states: "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area (36 CFR 219.19.) This requirement for species viability is placed within the context of requirements for ecological sustainability and ecosystem diversity, which state, in part, that "For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area." Further, the 1982 planning rule states with regard to plant species diversity: "Forest planning shall provide for diversity of plant and animal species and tree species consistent with the overall multiple-use objectives of the planning area." We therefore believe that the alternatives are well balanced in consideration of the need for change issues, including the requirement to sustain the diversity of plant and animal species. MP 3.4 does not provide the ecological

framework in which to accomplish this requirement as explained in the FEIS under ecosystem sustainability.

PC#366 E - We respectfully disagree with statements made that the Forest Service cannot duplicate many of the factors that maintained presettlement landscape and are outside the Range of Natural Variability. The context for defining and describing ecosystem health is based on The Terrestrial Natural Communities of Missouri (Nelson 2005), the Missouri Biodiversity Report (Nigh 1992), Ozarks Ecoregional Conservation Assessment (Ozark Ecoregional Conservation Team 2003), and the Missouri Natural Areas Program (see Appendix D-2, D-21). Achieving desired conditions for currently degraded natural communities is based on the first two key indicators listed on Chapter 3 of the FEIS. These key indicators are commonly used by federal, state, and private non-profit conservation organizations to monitor and evaluate whether management efforts to move toward desired conditions for ecosystem health are successful, or whether they need adjustments.

PC#366 F - The commenter believes that the Forest Service has no way of evaluating how much land presently exists that meets the requirements of these two descriptions. We strongly disagree. Information provided in the Ozarks Ecoregional Conservation Assessment (see pages 3-62 and 63 of the FEIS) provide the basis and rationale from which to focus project implementation efforts. The Forest Service and The Nature Conservancy will work together as a part of the ecosystem restoration implementation plan to identify the best places in which to commence project analysis.

PC#366 G - The commenter states that the Mark Twain National Forest is in conflict with the Weeks Law because of the meaning of conservation and restoration. The Mark Twain National Forest must also comply with all laws including the National Forest Management Act, the Multiple-Use, Sustained Yield Act, Endangered Species Act, and Hazardous Fuels Reduction Act, among others. Further, respective regulations and directives make clear the responsibility that decision makers have in applying considerable discretion regarding how to provide for species viability in consideration of multiple use objectives. With respect to conservation versus restoration, ecosystem restoration is defined as a process of improving ecosystem health. The ecosystem management framework, as applied in the 2005 Forest Plan, is intended to sustain biodiversity while meeting other multiple-use objectives, including sustainable wood products and other services.

PC#366 H - The commenter states “It is difficult to evaluate how much closed woodland and forest cover will be converted to open woodland and savanna by the creation of the MP 1.2 and 1.2” (we assume they mean 1.1 and 1.2). The 2005 Forest Plan provides the range of acres in which to apply management activities for savanna, open and closed woodland acres in MP 1.1 and 1.2 on page 1-2. Acres will be treated according to percentages of each type that occurred in respective ecological subsections (Table 1-1 and 1-2). Further, projected management activities are given in Appendix E-4. While the commenter references 118,000 acres of savanna, the actual acres treated during the first decade will range between 5,300 and 13,400 acres; the range of open woodland between 36,300 and 45,300 acres; and closed woodland 41,800 to 50,400 acres. The total range of acres projected to be treated ranges from 6.5% to 10% during the first decade. This figure also includes up to 19,400 acres of glade, 19,300 acres of forest and nearly 900 acres of fen.

PC#366 J - These regeneration acres were initially figured using the rotation ages of the various forest types. Subsequently, the desired condition descriptions (see Table A-1, Appendix A of the 2005 Forest Plan); standards and guidelines under Vegetation Management pages 3-3 and 3-4, and 3-7 and 3-8 of the 2005 Forest Plan provide guidance in how regeneration is used during project analysis. The total regeneration acres will be applied

to move current altered vegetation patterns toward more desirable conditions, particularly for various seral age classes in woodlands and savannas. Regeneration cuts also help establish the full range of habitat structure for shrubs, oak regeneration, young forests and establishment of grass/forb groundcover.

PC#366 L - The 2005 Forest Plan provides a range of alternatives that allow for maintenance or restoration of artificial openings where they already exist and are outside of Water Protection Zones and Riparian Management Zones. The alternatives identify various percentages of the Forest that would be allocated to ecosystem sustainability in MP 1.1 and 1.2 whereby concepts of ecosystem restoration (documented in Appendix B of the FEIS) are emphasized. Much of the existing condition for the Mark Twain National Forest reflects the history of early settlement and land abuse brought about by a century of overgrazing, which removed the highly productive ground layer of seed-rich forbs and grasses once vital to large assemblages of wildlife. The amounts and types of activities planned for MP 1.1 and 1.2 will move areas that surround artificial openings toward greater herbaceous ground cover species richness, thereby substituting food and cover needs for a greater variety and diversity of wildlife. Otherwise, artificial openings in other management prescriptions will continue to work well in settings where surrounding ground cover vegetation provides little dense cover, diversity and seed production.

PC#366 K and M - There are no restrictions under the specific MP 1.1 and 1.2 standards and guidelines regarding mineral exploration. Forestwide standards and guidelines apply as they do for the General Forest MP 2.1, except that surface excavation at drill sites is prohibited in MP 1.2, as it is in MP 6.2. (Page 3-10 of 2005 Forest Plan).

PC# 385 - The Mark Twain National Forest should not use heavy-cut regeneration targets in restoration zones.

PC# 385: See response to PC#193 (Theme 7.4), and PC#366J (Theme 1.9.)

Theme 1.10 - MP 2.1

PC# 271 - The Mark Twain National Forest should eliminate Management Prescription 2.1.
A) Including removal of theme wood products and storage.
B) Because there should not be a limit on how much old growth to be designated.
C) Because there should be no requirements to have regeneration openings.
D) Because all of the Visual Quality Objectives are too low.

PC#271 - The FEIS analyzed and displayed the environmental effects if no lands were allocated to Management Prescription 2.1. Wildlife would have fewer and smaller openings of early successional habitat, and no commercial timber would be allowed.

In reviewing these comments on MP 2.1, we did identify three changes that needed to be made to the management direction. The first two changes related to the comments regarding old growth and regeneration openings. Management prescriptions 2.1, 6.1, and 6.2 each included a standard requiring the designation of a percentage of each management area as permanent old growth, and a guideline describing the desired amount of regeneration openings. Upon further review by the ID team, it became obvious that these were actually goals and objectives, not standards and guidelines because they described a desired future condition, and were not permissions or limitations on activities.

The standard regarding old growth designation has been changed to an objective. This change will still require the designation of a percentage of these management areas as permanent old growth, because compliance with objectives is not optional, given necessary funding. This change also provides more flexibility in designating permanent old growth throughout a

management area to meet the needs of a variety of species. The guideline regarding regeneration openings is part of the desired condition described for each of these management prescriptions, and as such will help form the purpose and need for site-specific projects.

The third change was in response to a comment on the standard in MP 2.1 that stated activities should be distributed across the landscape to emulate historic vegetation patterns and quantities of natural communities. Part of the desired condition for MP 2.1 is that "natural communities are distributed similar to historical vegetation patterns." The ID team determined that a standard requiring that activities be distributed to emulate historical conditions was redundant with the desired condition, and therefore unnecessary. The proposed standard did not add any clarity to permitted or restricted activities, and therefore did not meet the basic purpose of a standard. The desired condition will be used at the project level to plan and guide proposed activities.

Theme 1.11 - MP 5.1

PC# 33 - The Mark Twain National Forest should increase signage in wilderness areas.
A) So people do not get lost.

PC#33 - Management objectives of designated Wilderness areas are to provide opportunities for primitive or unconfined recreation in an undeveloped recreation setting. This includes limiting group size, providing no facilities, and using minimal signing as described in ROS Appendix F of the 2005 Forest Plan. These reduced management controls lead to a closeness to nature, self-reliance on outdoor skills, high challenge and risk, and few contact with other people.

PC# 84 - The Mark Twain National Forest should clarify its documentation regarding trails.

PC#84 - No revisions or changes were made that would affect management of designated Wilderness areas. Management of these areas includes not only Standards and Guidelines but also the specific Act of Congress that designated the specific area. As discussed in the Preface to the 2005 Forest Plan, we have not repeated any management direction for Forest Service lands that appear in other documents. The Limits of Acceptable Change Monitoring process, a nation-wide system, focuses on the effects of use rather than numbers of users; is goal-driven rather than issue-driven; and defines indicators with associated standards that establish how much change in conditions will be accepted before "corrective" actions are implemented, rather than objectives (Wilderness Planning, Arthur Carhart Center, September 2002.)

PC# 272 - The Mark Twain National Forest should change standards and guidelines for Management Prescription 5.1.
A) By revising the desired condition to state that no developed facilities will exist other than trails.
B) Including clarification of which developed facilities will be in wilderness areas.
C) By making acquisition of private rights a standard.
D) Including clarification of horse and mule use of trails.
E) Including better maps of planned trail systems.
F) Including removal of the language "Signs primarily for the convenience of visitors such as extensive direction, information, interpretation, and mileage will not be provided."
G) By making attainment of Visual Quality Objectives for preservation a standard.
H) Including Management Intensity and Utilization.
I) By reconsidering special use management restrictions.
J) By allowing enforcement activities flexibility to impact wilderness experiences.

K) By making land ownership guidelines a standard.
L) Including consistent use of ECS and and LTAs.

PC#272 - No revisions or changes were made that would affect management of designed Wilderness area.

PC# 516 - The Mark Twain National Forest should clarify what the specific indicators of overuse are in the Paddy Creek Wilderness and whether or not there are management activities to control or mitigate the overuse.

PC#516 - As discussed in Chapter 3 of the FEIS under Environmental Consequences for Wilderness areas, visitor use has exceeded projections made in the 1986 Forest Plan but do not exceed the Wilderness carrying capacity. The term "overuse" in this context may not have been correct. "Overuse" in Wilderness can be characterized in different ways, such as more than 10 individuals in a party, or soil loss in excess of the standard listed in Table 3-6 of the Forest Plan. Information from Paddy Creek included trail register forms, personal contacts, and soil monitoring. Limits of Acceptable Change monitoring was conducted as prescribed in Chapter 4 of the 1986 Forest Plan to determine soil loss. In most instances, the soil loss was localized in areas of poor trail drainage, such as a mud puddle that trail users avoid, thereby creating a wider trail section.

Forest-wide measures were developed to protect soil resources in MP 5.1, as well as other areas of the Forest. Potential effects to soil and water quality will be a part of environmental analyses conducted for any future site-specific actions proposed in Wilderness. Additional mitigation measures as deemed necessary for resource protection may be developed at that time.

PC# 518 - The Mark Twain National Forest should clarify the horse density standard and how use that exceeds the standard is managed.

PC#518 - The standard related to the number of individuals that can travel together is the same regardless of whether they are hiking or riding animals – "No more than 10 individuals shall travel or camp together as a group." (2005 Forest Plan page 3-20). As stated in the guideline under Table 3-6 Indicators of Change, use that exceeds the standards in the table will result in an assessment to determine the cause and possible remedies. Individual Wilderness brochures ask users to "avoid overuse of popular areas, and search out the lesser known attractions." When overuse is noticed, information is posted at trailheads directing users to other parts of the wilderness or forest.

Theme 1.12 - MP 6.1

PC# 273 - The Mark Twain National Forest should change standards and guidelines for Management Prescription 6.1.
A) Including removal of the goal to provide timber products.
B) Including prohibition of mineral activities.
C) Including use of native grazers.
D) Including prohibition of timber harvests.
E) Including definitions of what individual management areas are.
F) Including prohibition of salvage unless it is counted towards the 10 percent limit.
G) By reconsidering its determination on cutting methods, and consideration of Pioneer Forest Methods.
H) Including the maintenance of existing waterholes.
I) By increasing percentage of old growth.
J) Including distribution of regeneration openings.
K) Including wording related to Transportation Management and more limits to maintenance.
L) By making minerals guidelines into standards.

PC#273 - All standards and guidelines were developed by resource specialists familiar with impacts of management activities on the Mark Twain National Forest. These specialists are very knowledgeable in their particular field of expertise including hydrology, ecology, forestry, and wildlife biology. Determining the appropriate level of measure (standard or guideline) was done using the interdisciplinary team of specialists' knowledge and experience as a foundation. In some cases, scientific literature helped the specialists develop the appropriate level of measure as well as the numbers, dates, or other quantifiable criteria specific to standards or guidelines. The specific distances and criteria used in the development of all standards and guidelines are scientifically sound.

An individual management area is one that is separated by other management prescriptions, for example within the Fredericktown Unit there are two 6.1 management areas, whereas within the Salem-Potosi unit there are four.

The Standard limiting timber harvest and other would allow management of the area while still meeting criteria found in FSH 1909.12, Chapter 7 for roadless areas in the East. The guideline to exceed the 10% limitation on timber harvest would have to be discussed in a site-specific environmental analysis. This is in compliance with NFMA. The decision to allow roads to revert to trails is a site-specific one that requires a project level roads analysis.

Theme 1.13 - MP 6.2

PC# 274 - The Mark Twain National Forest should eliminate Management Prescription 6.2 and place these areas in Management Prescription 6.1.
A) Including removal of the goal to provide timber products.
B) Including prohibition of mineral activities.
C) Including use of native grazers.
D) Including prohibition of timber harvests.
E) Including definitions of what individual management areas are.
F) Including prohibition of salvage unless it is counted towards the 10 percent limit.
G) By reconsidering its determination on cutting methods, and consideration of Pioneer Forest Methods.
H) By increasing percentage of old growth.
I) Including distribution of regeneration openings.
J) Including wording related to Transportation Management and more limits to maintenance.
K) By making minerals guidelines into standards.

PC#274 - See responses to Theme 17.5 and Theme 1.12.

Theme 1.14 - MP 6.3

PC# 275 - The Mark Twain National Forest should change standards and guidelines for Management Prescription 6.3.
A) By extending boundaries for scenic and recreation segments to 1/2 mile.
B) Including consideration of outstanding remarkable values when assessing management activities.
C) Including prohibition of timber harvesting unless done non-commercially.
D) By rewording standards for special uses management to acknowledge outstanding remarkable values.
E) By converting guidelines for mineral exploration to standards.
F) By rewording standards for water storage and transmission management to prohibit impacts on free-flow.
G) By restricting the entire period of drilling activities as needed to minimize impact on soils and wildlife.

PC#275 - Waterways are managed under this prescription similar to management specific to the Wild and Scenic Rivers Act. That Act prescribes the corridor of up to one-quarter mile, not to exceed 320 acres per linear mile. As stated in the Goal for this management prescription and within the first standard under Table 3-9, lands within the river corridor are to be managed to perpetuate the outstandingly remarkable values of the waterway. This standard does not need to be repeated as it applies to all resource management of the waterways.

The management of minerals and Wild and Scenic Rivers was not identified as an area of the 1986 that needed to be changed. Refer also to Themes 24.2 Allow Mining and 24.4 Effects of Mining.

Theme 1.15 - MP 7.1

PC# 276 - The Mark Twain National Forest should change standards and guidelines for Management Prescription 7.1.
A) Including a standard that composting toilets is preferable to pit toilets and should be used whenever possible.
B) By making any tree cutting non-commercial.
C) Including removal of the standard for retention of trees for recreation benefits.
D) Including only allowing native plants unless they are tested to not cause problems.

E) Including prohibition of the use of pesticides in recreation areas and if they are the public should be warned.
F) Including prohibition of ATV use.
G) Including making the guideline to temporarily close recreational developments when needed to allow for site rehabilitation a standard.
H) Including clarification about the Forest Service control of the hours of operation, season of operation, noise levels, protection of facilities, and public safety from non-surface disturbing mineral activities.

PC#276 - All standards and guidelines were developed by resource specialists familiar with impacts of management activities on the Mark Twain National Forest. These specialists are very knowledgeable in their particular field of expertise including hydrology, ecology, forestry, and wildlife biology. Determining the appropriate level of measure (standard or guideline) was done using the interdisciplinary team of specialists' knowledge and experience as a foundation. In some cases, scientific literature helped the specialists develop the appropriate level of measure as well as the numbers, dates, or other quantifiable criteria specific to standards or guidelines. The level of measure developed is appropriate for ensuring proper management on the National Forest. The specific distances and criteria used in the development of all standards and guidelines are scientifically sound.

Many factors have to be considered when installing a toilet. Requiring the use of only one type of toilet is too restrictive to respond to cost, maintenance and installation of facilities. Composting toilets can and are considered in recreation developments. This type of toilet requires daily maintenance and special location concerns which may not be options in all recreation areas.

It should be noted that Forest-wide standards and guidelines apply to these areas in addition to those listed specifically under Management Prescription 7.1.

The management of minerals and Wild and Scenic Rivers was not identified as an area of the 1986 that needed to be changed. Refer also to Themes 24.2 Allow Mining and 24.4 Effects of Mining.

Theme 1.16 - MP 8.1

PC# 277 - The Mark Twain National Forest should change goals, standards, and guidelines for Management Prescription 8.1.
A) Including making clear breaks between different areas of the document to clarify what the standards apply to.
B) To include the Ozark Trail in this Management Area.
C) Including a standard to evaluate or manage any area the state designates as a Natural Area on National Forests lands as 8.1.
D) Including eliminating goals that allow timber harvest and grazing.
E) By making a guideline for Special Uses a standard.
F) Including removal of guidelines allowing use of the forest for national defense reasons.
G) By making the guideline to purchase land from willing sellers to protect or enhance special areas into a standard.
H) By making the guideline to maintain or enhance the remarkable values of the Eleven Point National Scenic River into a standard.
I) Including standards to minimize impacts of motorized recreation on other users.
J) Including standards regarding what is and is not allowed on other land.
K) Including revising a standard to include that compost is preferable to pits in sanitation facilities within river corridors.
L) Including revising a standard for floodproofing of sanitation facilities.
M) Including standards allowing use of horses outside of developed areas as long as

they do not compromise the outstanding remarkable values of the Eleven Point National Scenic River Corridor .
N) Including removal of the salvage provision within the Eleven Point National Scenic River Corridor guidelines.
O) Including a guideline for manipulating vegetation within the Eleven Point National Scenic River Corridor as a standard.
P) Including prohibiting minerals exploration.
Q) Including guidelines requiring "No Motor Vehicle" signs being posted for National Recreation Trails as standards.
R) Including prohibiting timber harvest within sight of a trail.
S) Including clarification of the standard for Lower Current River Special Area Recreation regarding resource protection.
T) Including a guideline providing foot access to Greer Spring Special Management Area as a standard.
U) By requiring all timber harvest to be done non-commercially.
V) By making guidelines to not allow surface disturbing mineral activities into standards.
W) By specifying that vehicle access may only be provided at listed locations.
X) Including a guideline allowing dispersed camping being a standard.
Y) Including strengthening the timber harvesting standards specific to National Recreation Trails.
Z) Including withdrawal of mineral entry.

PC#277 - All State Natural Areas will be allocated to Management Prescription 8.1. We respectfully disagree with the commenter that only non-commercial tree cutting should be used in 8.1 areas. Commercial methods and grazing are an appropriate use of National Forests when conducted within the capability of sustainable ecosystems and meeting desired conditions. The 2005 Forest Plan guides management to minimize or mitigate adverse effects to the environment. Alternative 1 of the FEIS displays analysis for managing the Mark Twain National Forest without commercial harvest.

The commenter recommended that many guidelines be changed to standards without any clear explanation or rationale. Thus, we reconsidered each recommended change based on the interdisciplinary team's determined level of measure (standard or guideline) based on specialists, knowledge, and experience. These specialists are very knowledgeable in their particular field of expertise including hydrology, ecology, forestry, and wildlife biology. Guidelines provide more flexibility by streamlining and improving management's response to changing conditions and adaptive management. We did consider and removed the guideline allowing the use of the forest for national defense reasons.

Forest Service Manual direction found in FSM 2353 covers the process for designation of National Trails. This designation and evaluation process is a site-specific rather than programmatic decision. During the evaluation of the Ozark Trail specific standards and guidelines could be developed.

Current River concerns are addressed under Theme 17.3.

Eleven Point River Management - This is a restatement of the goal for management of specific Outstandingly Remarkable Values of this river rather than a guideline. This goal is part of all the management within the river corridor and does not need to be repeated with each standard or guideline. Visual management is covered in forest-wide standards and guidelines and is supplemented by Appendix G. Motorized use along and within the river corridor has not been changed in this revised forest plan. Landowners can allow the public to camp on their land; however, the Forest Service cannot grant use of private land to the public, even if it is under a scenic easement.

Lands within the Greer Spring Special Management Area were withdrawn from minerals activities in the enacting legislations. The Greer Spring Acquisition and Protection Act of 1991 is a Public Law specifically prohibited under 43 CFR 1714(j): "The Secretary shall not make, modify, or revoke any withdrawal created by Act of Congress". Therefore, the decision to withdraw minerals from management within the Greer Springs Special Management Area is outside the scope of the agency.

Theme 1.17 - Appeals process

PC# 295 - The Mark Twain National Forest should use the appeals process in the Final EIS.
A) Rather than the objection process.

PC#295 - The Mark Twain National Forest will be using the appeals process.

Theme 1.18 - Scientific basis for analysis

PC# 3 - The Mark Twain National Forest should provide better scientific basis for alternative selection.
A) To support claims that unhealthy forests would occur under Alternative 1.
B) By providing monitoring results to support claims that Alternatives 2,3, and 4 will restore desired ecosystems.
C) Including description of how forests are expected to respond after oak declines versus timber harvests.
D) To explain why unnatural processes are being proposed to restore natural ecosystems.
E) By providing a legally adequate cumulative effects analysis.

PC# 3 - As explained in the FEIS, Alternative 1 would lead to a much greater area of the MTNF in dense overstocked stands dominated primarily by the red oak group. The Timber Supply section (3-17) and Ecosystem Sustainability and Ecosystem Health (3-50) show that much of the present-day forest composition is far removed from the historic range of variability. The chronology and history of events that led to oak decline are explained in Sutton (2001) and Spencer (2001). Additionally, the science behind oak decline in the Ozark Interior Highlands is well documented (see Upland Oak Ecology Symposium: History, Current Conditions, and Sustainability 2004). The commenter states that the MTNF is using "unnatural" processes to achieve desired conditions. The context for applying management techniques and methods is explained in Appendix D-21 of the FEIS. For clarification, emulating natural disturbance processes is about balancing the severity, scale and frequency of disturbance processes with the management-assisted recovery of ecosystem conditions. The current condition for most of the Ozark Highland ecosystems is much different when compared to the historic condition. It is a goal of the Mark Twain National Forest and mission of the U.S. Forest Service to provide forest products to meet society's demands for renewable resources in a manner that sustains resources. Emulating natural processes means conducting management activities (timber harvest, grazing, etc) in ways that best mimic or balance the presumed historic extent of natural communities (see Forest Research Information Paper No. 149; Emulating Natural Forest Landscape Disturbances: Concepts and Applications, 2002). We disagree with the commenter that the DEIS does not explain how silvicultural methods will improve forest health. With respect to increase in wildfires resulting from accumulating fuels, see response to PC# 391E (Theme 11.1). Also, the MTNF has collected fuels data for before/after treatments, and is in the process of establishing fuel monitoring plots across the Forest. We also believe that the cumulative effects analysis under the timber management section of the FEIS is adequate.

PC# 218 - The Mark Twain National Forest should base its decisions on sound science.
A) Regarding road density.
B) Including the Best Available Technology regarding mining.
C) And should follow the forest plan until there is more scientific evidence on how to handle sensitive species.
D) Including science provided by Sinkin to reach the goals and objectives of pine and oak management.

PC#218 - The MTNF frequently confers with staff in the North Central Forest Research Station regarding research needs and results, in addition to examining other research needs as well. Research topics we've reviewed, among many, range from "Conversion of Successionally Stable Even-Aged Oak Stands To An Uneven-Aged Structure" to the more contemporary "Ecological Restoration Through Silviculture—A Savanna Management Demonstration Area, Sinkin Experimental Forest." The NCRS is also cooperating with the MTNF to model and project natural community habitat needs for select vertebrates species following ecosystem management activities, including silvicultural practices.

PC#218 A - The Forest Service has eliminated road density standards from the Revised Forest Plan because they have proved ineffective in guiding management of the transportation system on the MTNF. The transportation system on MTNF is primarily in place and we do not anticipate building a significant amount of new roads over the next 10-15 years. We do anticipate decommissioning roads not needed for management. The transportation system for MTNF will be identified in the Transportation Atlas (2005 Forest Plan page 2-39), and will complement the Recreation Opportunity Spectrum for each management area. Decisions regarding individual roads will be made during site-specific project analyses (2005 Forest Plan page 2-39).

PC#218 B - Any decisions on future mineral development would be made after site-specific analysis of potential impacts to surface and subsurface resources.

PC#218 C - The Forest Service intends to follow the direction outlined in the 2005 Forest Plan as soon as it can be implemented (30 days after Notice of Availability of Record of Decision is published in the Federal Register). Until then, we will continue to comply with direction stated in the 1986 Forest Plan.

PC# 296 - The Mark Twain National Forest should adequately respond to questions.
A) Including an explanation of how vegetation data from the Forest's Combined Data System complies with the USDA Information Quality Guidelines and the methodology used to gather and verify the data.
B) Including data for modeling oak decline.
C) Including a discussion of the adverse effects of chip mills.
D) Including footnotes describing the scientific basis for allowing salvage operations to continue.
E) Including the scientific basis for how tornados damage the forest.

PC#296 - The Planning Team, including Rich Hall and Laura Watts, has been available to answer the public's questions throughout the comment period. The commenter is complaining that they were unavailable on the last afternoon of the comment period. Both Mr. Hall and Ms. Watts had previously met with this commenter in a meeting at the Forest Service office, and had fielded questions from the commenter at several public meetings. The commenter had adequate opportunities to have his questions answered. The Planning Team employees have many and varied duties that occasionally require them to be away from their desks, phones and computers. It is clear that the absence of these two employees for a few hours one afternoon during the 90 day comment period did not affect the commenter's

ability to submit comments since the Forest Service received a document of over 200 pages in response to the Draft Forest Plan and Draft EIS.

Appendix A of the Draft Forest Plan is not a "Response to Comments", it is a description of the Public Involvement process followed during development of the 2005 Forest Plan and EIS. The comments received through this process were used to refine issues and develop alternatives to the proposed action.

PC#296 A - Information about vegetation data collection process is found at http://www.fs.fed.us/emc/nris/products/fsveg/index.shtml. The resulting plot data is stored in the Forest Service's National Field Sampled Vegetation (FSVeg) database and then summarized and stored in Region 9's Combined Data System (CDS).

PC#296 B - As discussed in Appendix B of the FEIS, several assumptions were made for modeling timber management area prescriptions, allocations, outputs, and scheduling activities. One of the assumptions is that modeling for forest type conversions and future oak decline is not included. Oak decline is not modeled specifically, but oak decline was active on the tree plot data used to build the yield tables, so it was implicitly modeled.

PC#296 C - See Response to PC#69 (Theme 6.2)

PC#296 D - See Response to PC#60 and 134 (Theme 6.7)

PC#296 E- The commenter is taking the phrase "tornado damage" out of context where cited on page 3-32 of the DEIS in reference to the vegetation change study. Tornado damage or effects (as with wildfire, insect diseases, floods, etc) can in human terms be destroyers of human values (timber resources, increased fuel buildup) while as a disturbance process it renews ecosystems (see Appendix D of FEIS on disturbance processes).

PC# 509 - The Mark Twain National Forest should provide scientific data.
A) Including effects on species richness.
B) Including effects on oak decline.
C) Including effects on increased insect population.
D) Including effects on forest health.
E) Including wildlife use of the area.
F) Including effects on timber sales and Forest Service budget.
G) Including effects on Riparian Management Zones.

PC#509 - The programmatic effects analysis was developed using a large body of published scientific information and data, as well as the professional integration of this knowledge with the practical, local experience of managing Ozark ecosystems. Extensive scientific databases of resource inventory and monitoring information maintained by the Forest and State were central to the development of the 2005 Forest Plan (see project record). The effects analysis was developed with input from State and other non-federal scientists and resource professionals. The Forest employs, and has been in contact with, the leading experts in ecological restoration in Missouri. Monitoring data and scientific information from ongoing ecological restoration efforts in Missouri were considered in developing the effects disclosure. Wildlife, vegetation, and biological diversity effects of these efforts were of particular interest to the Forest. We gained valuable insight from scientific information, in the form of published articles, monitoring data, and expert opinion, from both agency and non-federal scientists.

We note, however, that some information was submitted to the Forest describing conditions in the Pacific Northwest, Southeast, and other distant regions of the United States. While interesting, this information often has no direct bearing on the ecosystem processes and functions of the Ozarks. Methods and practices employed in Douglas-fir coniferous forests,

for example are generally not applicable to the deciduous central hardwoods ecosystems. Thus, the 2005 Forest Plan effects analysis relies most heavily upon published scientific information germane to Missouri and the Ozark ecosystems. NFMA regulations require the interdisciplinary team to "collect, assemble, and use data, maps, graphic material, and explanatory aids, of a kind character, and quality , and to the detail appropriate for the management decisions to be made." (1982 version 36 CFR 219.12(d)). NEPA regulations require that "[a]gencies shall insure the professional integrity, including scientific integrity, of the discussion and analysis in environmental impact statements." (40 CFR 1502.24). Following this direction, the Mark Twain National Forest utilized a large amount of scientific information in the programmatic EIS on wildlife, insects, and vegetation, with particular attention given to science pertaining to flora and fauna occurring in Missouri.

There is no indication in the comment received that any particular peer-reviewed scientific information was overlooked or ignored by the Forest. To the best of our knowledge, all specific opposing scientific viewpoints concerning natural resource management and ecological restoration in the Ozarks have been taken into consideration. Nothing in the comment contradicts this belief. We diligently sought-out research information and data to lear from others, and were particularly interested in those scientific studies that showed results that might be contrary or even opposed to what we anticipated and expected. The planning record documents the use of substantial scientific data (FEIS, Chapter 6 and project record). Natural resource management - especially with regard to maintaining plant and animal community diversity - is a complex undertaking involving understanding of facts and analysis that requires a high level of technical expertise. This is particularly true of the Mark Twain National Forest, with its uniquely diverse ecological character (TNC 2003, page 8, Nigh, et al 1992, page 31). Yet, the Forest is mandated by Congress to be managed for multiple uses, including timber use. Congress delegated to the Forest the responsibility of using scientific information to choose the appropriate balance of uses on the Forest. Maintenance of a pristine environment runs counter to the notion of balanced, multiple-use resource management Congress codified in NFMA and the Multiple-use Sustained-Yield Act.

The effects analysis for each of the areas of concern in the comment - wildlife, oak decline, insects, forest health, budge, and riparian areas - was founded upon the available published scientific information. This programmatic effects disclosure is commensurate with the development of a programmatic framework or plan. Perhaps to a degree greater than ever before, we have incorporated science into the 2005 Forest Plan. Consideration of all the available scientific information was ignored or overlooked, but rather, we embraced diverse scientific opinions as part of the task of developing a complex natural resource management framework for the next 10-15 years. The Forest took a hard look at differences in analysis methodology and other areas of evolving scientific work. Disagreements amongst expert may be found in any profession, and resource management is no exception. Such scientific disagreements were not ignored, but rather noted and observed as areas of uncertainty and opportunities for learning an adaptive management. NEPA does not require resolution of disagreements amongst various scientists as to methodology. As new scientific and monitoring information becomes available, we anticipate the Revised Plan will be adapted and amended.

PC# 521 - The Mark Twain National Forest should utilize recently developed spacial information from the Missouri Resource Assessment Partnership to address cumulative impacts.
A) Including coordination with the Ouachita and Ozark-St. Francis Forests in Northwest Arkansas to ensure that burn activities in those forests do not exert a negative effect on Missouri populations or resources.

PC#521 - The Missouri Resources Assessment Partnership (MoRAP) data has been used in the DEIS analysis and references to the data and work have been added. Much of the data and tools developed by MoRAP will be utilized for project level analysis.

The level of detail required of an EIS depends upon the nature and scope of the proposed action. Fundamental to development of a programmatic forest plan is the premise that forest plans, including this revised plan, is permission; it allows but does not mandate certain activities to take place within the planning unit. This plan simply establishes a framework for management in an ever-changing environment, *see* "Overview of Forest Planning at www.fs.fed.us/emc/nfma. The relevant issues, analyses, and decisions made at the programmatic level are quite different from those required for the development of projects.

Since the plan revision only provides a framework for management, it does not authorize any ground-disturbing activities or commit funding for such activities. Thus, the analysis associated with this revised plan is proportional to the level of decisions being made. The plan "zones" the Mark Twain National Forest into areas where activities may occur that could move the area towards the desired condition. The plan is therefore supported by a programmatic analysis that evaluates on a broad level the potential environmental effects of a broad management framework. The programmatic EIS involved (*see* 50 CFR 1502.20, 1508.18) her defers disclosure of site-specific impacts to project development.

In response to comments received, the disclosure of cumulative effects analysis has been clarified throughout the FEIS. This programmatic analysis is by its very nature a cumulative effects document. The cumulative effects disclosure is appropriate given the programmatic scale of this analysis. A more specific cumulative effects analysis is better done when a specific development action or site-specific project has been proposed, not at the programmatic level.

Theme 1.19 - Positive Feedback

PC# 353 - The Mark Twain National Forest should consider positive feedback for the Draft EIS.
A) Including that the Draft EIS Summary is well organized and easy to understand.
B) Including support for designation of old growth.
C) Including support for phasing out grazing.
D) Including support for removal of glades, riparian areas, karst areas, and other sensitive areas from the timber base.
E) Including support for restoration of natural communities/ecosystems.
F) Including support for designation of one quarter mile strip along the shoreline of Table Rock Lake and Lake Wapapello as permanent old growth.
G) Including support for the creation of Riparian and Watercourse Protection Zones that apply management constraints to areas along intermittent watercourses.
H) Including the 1.1 and 1.2 Management Prescriptions.
I) With future consideration for use of ECS to describe the areas and the use of ELTs to identify potential natural community distribution.
J) Including support for the emphasis on ecological restoration, sustainability, and awareness.
K) Including the 1,570 acres included as Wilderness Study Areas.
L) Including the protection of streams.

M) Including not expanding the areas or types of roads open to off-road vehicles.
N) Including the emphasis on completing the Ozark Trail.
O) Including support for no new mining.

PC#353 - We appreciate your support of various aspects of the Plan.

Theme 1.20 - Plan changes

PC# 354 - The Mark Twain National Forest should consider revisions to the Draft Forest Plan.
A) Including "Forest Profile" as an opening chapter in the plan to set the stage for goals and objectives.
B) Including restoration and Threatened and Endangered species recovery as the highest priority.
C) Because of the lack of site-specific management that was successfully appealed in the 86 plan.
D) Including more protection for rivers, forests, and wildlife.
E) Including reducing destructive mining, timber harvesting, road construction, and off-road vehicle use.
F) Including reversing the relaxation of standards for wilderness and current roadless areas such as Lower Rock Creek
G) Including disallowing even-aged management in the forest.
H) Including greater protection of waterways within or adjacent to the forest.

PC#354 A - Thank you for your suggestion.

PC#354 B - Restoration and recovery of endangered species is fully supported by MTNF in consultation with the US Fish and Wildlife Service and cooperation with the Missouri Department of Conservation. This is clearly stated in Goal 1.4 in the 2005 Forest Plan (page 1-3) and a wide variety of standards and guidelines were developed to provide quality habitat and protection of individuals of the federal and state listed species that may occur on MTNF or be affected by MTNF activities (2005 Forest Plan pages 2-5 through 2-7). Standards and guidelines for federal species were added or modified for the Final EIS as a result of informal consultation with the U.S. Fish and Wildlife Service.

PC#354 C - The Forest Plan is a programmatic document that provides guidance for resource management activities on the Forest. Site-specific activities that implement the Plan are determined through site-specific analysis of proposed projects documented in an appropriate NEPA document. The Forest Service believes the guidance and direction contained in the Management Area Prescriptions is specific enough to provide the appropriate level of direction to employees who will be implementing the 2005 Forest Plan.

PC#354 D, E - We believe that the Revised Forest Plan protects rivers, forests and wildlife, and that the standards and guidelines mitigate the harmful impacts from activities such as mining, timber harvesting, road construction and ORV use. Those who would like to see these activities severely limited or eliminated from the Forest would probably prefer to see Alternative 1 implemented. Alternative 1 is described on pages 2-8 through 2-9 of the FEIS.

PC#354 F - Wilderness is addressed by Revision Topic 4b – Special area allocations (FEIS page 1-7), and on pages 3-13 through 3-32 of the 2005 Forest Plan.

PC#354 G - Commenter's concerns are addressed by Revision Topics 1b – Even aged and Uneven aged management (FEIS pages 1-3 and 1-4). Even-aged regeneration harvest, including clearcutting is also addressed in the 2005 Forest Plan on pages 2-9, and 2-28 through 2-29.

PC#354 H - See Revision Topic 5 – Riparian areas and water quality (FEIS page 1-7). Protection of waterways is provided by standards and guidelines as described on pages 2-2 through 2-5 of the 2005 Forest Plan.

PC# 354 I– Several studies have been completed on the important functions of headwaters and low order streams have. Studies have also been done on the impacts of activities in the reaches of these small channels. Considerable research was reviewed by the IDT while developing the standards that were incorporated into the 2005 Forest Plan. This information is all included in the project file for the 2005 Forest Plan. Page 3-224 of the FEIS briefly address the importance of the headwater streams.

Theme 1.21 - Cumulative Impacts

PC# 517 - The Mark Twain National Forest should clarify what is known about the effects of "other ownerships" on forest management objectives.
A) Including grazing practices.
B) Because without an accounting of pesticide products used and volume applied, the declaration that no cumulative effects exist could be questioned.

PC#517 - Analysis of the grazing practices on other ownerships is displayed in the effects on pages 3-276 of the FEIS.

The FEIS on pg. 3-140 discloses that there will likely be no direct or indirect effects to habitat of species at risk from pesticide contamination. This Forest Plan Revision programmatic analysis and decision does not authorize the site-specific use of any particular pesticide at any location. This programmatic analysis sets forth and evaluates a broad-scale management direction framework for possible future pesticide use. At this broad level of analysis, it is speculative to attempt to disclose pesticide use by thousands of citizens and businesses across tens of thousands of non-federal land parcels. As this analysis and decision does not authorize or fund the use of any pesticides, it has no direct or indirect environmental effects.

Future site-specific decisions will analyze the proposed use of pesticides, taking into consideration the use of pesticides on non-federal land as part of a cumulative effects analysis. The programmatic plan direction sets forth constraints on the use of pesticides to protect forest resources. Projects are required to be consistent with Forest Plan standards. At the project level of analysis, the sources of information suggested by the commentor may be contacted, as appropriate, for local, current information on non-federal pesticide use. This information may then be considered in the cumulative effects analysis of projects proposing th use of pesticides on the National Forest.

Years of monitoring water quality and other Forest resources indicate that past use of pesticides on the Forest has not impaired any resource, nor has any information been provided to the Forest to the contrary. Use of pesticides is carefully controlled and monitored on the Forest.

General Theme 2 - Public Involvement/Communication

Theme 2.1 - Public involvement

PC# 214 - The Mark Twain National Forest should consider public input on forest management.
A) From local citizens.
B) Including late comments from the National Park Service, Ozark National Scenic Riverways.

PC# 214 - Appendix A of the FEIS describes the public involvement process for the Forest Plan Revision. A variety of formats has been used to inform the public about the proposed revision, from public meetings to information on the Mark Twain National Forest website. In response to the 2005 Forest Plan and FEIS, we received over 1800 individual responses (some with multiple signatures) from all over the United States (including many from the 29 counties which contain MTNF lands) and from several other countries. All comments have been read, evaluated and categorized by issue. Responses have been prepared for all comments received, including those of the National Park Service, Ozark National Scenic Riverways.

PC# 260 - The Mark Twain National Forest should make the Biological Assessment available for public comment.

PC#260 A Biological Assessment has been completed and will be available as part of the Final EIS.

PC# 261 - The Mark Twain National Forest should specify how many people agree and disagree with the Forest Service.
A) To avoid bias.

PC#261 The deciding officer will make his final selection of alternatives based on a variety of factors, including public comment. The final decision is not a reflection of the number of people who "chose" one alternative or another, but a careful consideration of the issues, resource impacts, and compliance with laws and regulations.

PC# 291 - The Mark Twain National Forest should avoid catering to special interest groups.
A) And focus on managing the forests not private property.
B) Including industry groups.

PC#291 - The Forest Service has no authority and no intention of managing private property adjacent to the Mark Twain National Forest. Through its State and Private Forestry staff, the Forest Service is authorized to work cooperatively with landowners to help them improve resource management , see <www.fs.fed.us/spf> Under NFMA, the Multiple-Use Sustained-Yield Act, and other applicable federal laws, the Forest Service administers National Forest System lands for multiple use resources management. Conservation of soil, water, plant, and animal resources are a key part of the Forest Service mission. The entire scope and focus of the 2005 Forest Plan is the management of National Forest System lands. Nothing in the 2005 Forest Plan authorizes or funds actions on privately-owned land.

The development of a Forest Service land and resource management plan is a complex undertaking involving synthesis of considerable scientific information and reconciliation of widely-divergent views on how the Mark Twain should be managed. But, this is not new, for the first guide to Forest Service field managers, known as the Forest Service Manual, advised "where conflicting interests must be reconciled, the question will always be decided from the standpoint of the greatest good of the greatest number in the long run." Gifford Pinchot, the first Chief of the Forest Service noted in June 1907 that,

> [t]here are many great interests on the National Forests which sometimes conflict a little. They must be made to fit into one another so that the machine runs smoothly as a whole. It is often necessary for one man to give way a little here, another a little here. But by giving way a little at present they both profit by it a great deal in the end. National Forests exist because the people want them. To make them accomplish the most good the people themselves must make clear how they want them run.

Thus, conflict in National Forest management has been present since the very beginning of the Forests. Often it appears that the agency has "catered" to an interest when in fact the Forest has facilitated a compromise between bitterly opposed public interests.

NFMA does not mandate the creation of a pristine environment, nor the protection of the status quo at all cost. Instead, NFMA allows the Forest Service to work with the public to define the appropriate uses and level of protection it affords to National Forest resources. Maintenance of a pristine environment is contrary to the notion that NFMA contemplates multiple use management. Indeed, the desire to maintain a National Forest in a pristine state collides with the multiple uses that Congress has endorsed for the Forests in NFMA. NFMA regulations acknowledge that management is often needed to protect resources and enhance diversity. Conservation of one resource often comes at the expense of a higher level of protection of another resource. Clearly, protection and conservation of resources embodies policy-oriented choices that Congress delegated to the Forest Service.

In development of the 2005 Forest Plan, the Mark Twain National Forest is faced with a nearly impossible task: reconciling many different and polarized interests. The Forest has engaged in an unprecedented review, analysis, and public involvement task and developed alternatives to manage the Forest. The preferred alternative strikes a balance between and among competing uses and interests. Because of the nature of the planning exercise, some will be dissatisfied because the selected alternative was not their alternative. It is important to remember, however, that the selected alternative is a balance of views - it is no one person or groups suggested alternative. The 2005 Forest Plan is dynamic and will be amended as information and the human environment changes over time.

Taking divergent public views into account, the Mark Twain NF crafted a balanced Forest Plan. The Forest has sought the views of a wide spectrum of interests (including environmental organizations as well as timber industry) and treated various interests equally. There is no evidence of "catering" or special treatment of any particular interest. Instead, the planning record documents the extraordinary degree of public involvement in Plan revision. The Forest development of the 2005 Forest Plan in 2003-2005 involved trade-offs, just as it did in Gifford Pinchot's day. Congress has required the National Forests to be managed according to multiple use principles, and this requires compromise between competing views of how the Forest should be managed.

PC# 371 - The Mark Twain National Forest should consider that a presentation of the basics of the new plan at the beginning of meetings would have been helpful.
A) To assist in forming a contextual framework.
B) Because the organization of the documents is not transparent.
C) Because it is difficult to find things in the documents.
D) Because the opportunities to speak with Forest Service personnel at public meetings were not well utilized because of the difficulty in framing questions.

PC#371 - We will consider your suggestions for future meetings and open houses.

Theme 2.2 - Education

PC# 215 - The Mark Twain National Forest should base public involvement and education on scientific research and related monitoring.
A) Because more public hearings, citizens advisory boards and education would help control the misunderstandings and hostility that develops on potentially emotional issues in the past.

PC#215 - See Response to PC#399 (Theme 8.6)

PC# 217 - The Mark Twain National Forest should educate the public about the uses and benefits of the forest.
A) Including volunteer projects.
B) Including why fire is an important and necessary tool.
C) To minimize challenges/impacts on agencies responsible for prescribed fire safety.
D) Including a wide variety of venues such as brochures and other public relations materials.

PC#217A - Cooperative and volunteer programs are outside the scope of Forest Plan decisions, but there is nothing in the 2005 Forest Plan that would prohibit or prevent such efforts. In our experience the most successful long-term relationships of this kind are those initiated by the interested volunteers, and not by the agency. It requires a dedicated core of individuals to make and keep a cooperative effort effective throughout the years, on the part of both the agency and public. The Mark Twain National Forest has hosted several Partners in Time (PIT) projects over the past several years. These projects invite volunteers to be part of an archaeological survey or evaluation, and have been very successfully received by the participants.

PC#217B, C - We agree that informing the public about the benefits and challenges of fire is an important effort. The Forest Service has initiated several efforts over the past decade, including FIREWISE, a program to help homeowners in fire-prone areas improve the defensible space around their homes, and take preventive measures in the event a wildfire threatens their home.

The deciding officer will carefully consider all the implications of increasing the prescribed fire program on the Mark Twain National Forest before making a decision. Mark Twain National Forest personnel cooperate closely with the Missouri Department of Conservation, National Park Service, and other federal, state, and local fire-management agencies on issues related to prescribed burning and wildfire in Missouri. We are committed to the safe and effective use of prescribed fire on the Mark Twain National Forest and protection of private properties from wildfire.

PC#217D - We agree that informing the public about the benefits, uses, and experiences available from management of the Mark Twain National Forest is an important effort that can pay great dividends in increased understanding and support of the public. It is a difficult and challenging job to reach the majority of Americans who are bombarded with all types of information in today's society. The Forest Service is making an effort to reach Americans through increased access and information available on the Internet, as well as efforts such as the urbanization of Smokey Bear's image and message. The Mark Twain National Forest works with the Eastern National Forest Interpretive Association and Ozark Interpretive Association to provide materials relevant to National Forest management at the Rolla Area Chamber of Commerce and at the Ava and Cedar Creek Ranger District Offices. Interpretive and educational programs are outside the scope of Forest Plan decisions, but we appreciate commenter's suggestions on how to improve.

Theme 2.3 - Coordination with Others

PC# 278 - The Mark Twain National Forest should coordinate with other groups on the forest plan.
A) Including local governments such as Missouri Counties.
B) Including a meeting between the Mark Twain National Forest personnel and representatives of Pioneer Forest, The Nature Conservancy, and Mark Twain Forest Watchers.
C) Including local Citizens, local businesses, and local forest personnel who know the local conditions and whose livelihood is at stake.
D) Including coordination with the Federal Aviation Administration regarding the effects of smoke from prescribed burns on aircraft.
E) Including the Environmental Protection Agency and the Forest Service Law Enforcement and Investigation regarding any suspected uncontrolled or abandoned hazardous materials, sites, or contamination found on or near National Forest System lands.
F) Including the Ozark National Scenic Riverways regarding proposed lead mining within the Riverway watershed.

PC#278A - All 29 Missouri counties which include some National Forest lands have received invitations to be involved through the public comment process (see Appendix A of the Draft EIS). Public meetings and open houses have been held in several of these counties. Several District Rangers contacted the County Commissioners of counties within their Districts when the Draft Forest Plan and Draft EIS were issued. Several counties responded with public comments.

PC#278B - The Mark Twain National Forest appreciates our long-term relationship with interested parties such as Mark Twain Forest Watchers and others. Many forums, including meetings, are potential methods for us to discuss our mutual interests and concerns, and attempt to resolve differences.

PC#278C - The Forest Service appreciates the willingness of the Forest Products Industry to act in partnership for good resource management and stewardship of Mark Twain National Forest lands. Also see response to PC#68 (Theme 1.4).

PC#278D - The appropriate time to consider potential impacts of an individual burn (including smoke management concerns) and the notifications necessary to safely and effectively complete that burn is during development of the prescribed burn plan for each site-specific burn.

PC#278E - The intent of this standard is to require immediate reporting of these situations. Most Forest Service field-going personnel who are in a position to find suspected uncontrolled or abandoned hazardous waste materials, sites, or contamination found on or near MTNF lands, do not have easy access to contacts with EPA or DNR. However, they are very familiar with their local Forest Service law enforcement agent, and this standard ensures swift reporting of such incidences. The Forest Service law enforcement agents are the most appropriate persons to notify personnel from other agencies which have a regulatory or enforcement responsibility for illegal activities.

PC#278F - If lead exploration or development were proposed in the future within the watersheds of the Current or Jacks Fork Rivers, the Forest Service would request input from the National Park Service, Ozark National Scenic Riverways.

General Theme 3 - Role of Forest

Theme 3.1 - Role of the Forest

PC# 112 - The Mark Twain National Forest should consider that national forests are meant to be for multiple use.
A) In addition to timber harvest.
B) In addition to restoration of pristine conditions.
C) To meet the needs of agriculture producers, private landowners, the forest products industry, local communities and the citizens of the state.
D) Including livestock grazing.

PC# 112 -The 2005 Forest Plan is consistent with the 1982 Planning Rule and the new 2005 Planning Rule, which continues to adopt social, economic, and ecological sustainability as the goal of the National Forest System. This goal is pursuant to the Multiple-Use Sustained Yield Act and the National Forest Management Act, setting the stage for a planning process that is responsive to a wide variety of desires and needs for multiple uses of National Forest Lands. Specific to the timber industry, it should be noted that timber production nationwide has been reduced dramatically since the National Forest Management Act was written. This parallels the trend on the Mark Twain National Forest, which we feel reflects contemporary priorities and values. Specific to restoring natural communities, the planning process and corresponding new Forest Plan outlines desired conditions based on a framework of sustaining and restoring a range of ecological and climatic conditions as they existed prior to European settlement (see FEIS, page 3-13). The reference period used as the time to estimate historical range of variability is covered in Chapter 43.13 of Interim Directive FSH 1909.12-Land Management Planning Handbook.

NFMA, 16 U.S.C. Section 1604(e) requires that forest plan revision "provide for multiple use and sustained yield of the products and services obtained therefrom in accordance with the Multiple-Use Sustained-Yield Act of 1960 (MUSYA), 16 U.S.C. Secs. 528-531" and that forest management, harvesting, and procedures be determined in a multiple use context. MUSYA speaks in broad terms on multiple uses of the National Forest and does not specify a required mix of uses. Some that have examined the general clauses and phrases of MUSYA have described the Act as "breath[ing] discretion at every pore," meaning that MUSYA embodies policy choices so that there is no law for a reviewing court to apply. Simply put, multiple use management requires the Forest to develop the appropriate mix of uses. The emphasis of one resource management goal may therefore come at the expense of another. MUSYA simply requires the Forest to give "due consideration" to the various competing uses. MUSYA, by its very nature, embodies trade-offs.

Under NFMA, Congress has given the Forest Service wide discretion t weigh and decide the proper uses of the Forests. Within this broad discretion a Forest may choose to allow for management of less than all the resources of a given area by prohibiting some uses for the 10 to 15-year lifespan of the of the plan. MUSYA does not contemplate that every acre of National Forest be managed for every multiple use. 16 U.S.C. Sec. 531. Congress delegated to the agency the authority to manage the National Forests using a multiple use framework for decisionmaking.

PC# 112 A, B - The Forest-wide Goals, stated on pages 1-1 through 1-6 of the 2005 Forest Plan clearly describe a balance of objectives, uses, experiences, and resources that would be provided through implementation of the 2005 Forest Plan. In particular, Goal 2.4, Timber Management states clearly that timber management is to be used where appropriate to achieve a variety of objectives, including restoration of degraded ecosystems and reducing hazardous fuels. The Forest Service is charged with responsible management of all natural

resources on the National Forest, which includes the consideration of effects on local, regional, and national economies.
The comment appears to have misconstrued the intent of ecological restoration as embodied in the 2005 Forest Plan. The Mark Twain National Forest consists of lands acquired by the Forest Service since the 1930s as cut-over timber land and worn-out farmland. It would be difficult, if not futile, to attempt to restore a "pristine" environment. For example, some species present in a pristine Ozark ecosystem are now extinct. Even if it were possible to reproduce a pristine ecosystem, NFMA mandates that he National Forests be managed for a mix of multiple uses, including timber. NFMA blends water, wildlife, and other environmental interests with timber by requiring that National Forests be managed under the principles of multiple use and sustained yield.

Maintenance or provision of a pristine environment is counter to the notion that NFMA contemplates both even and uneven-aged timber management. Providing for a "pristine" environment contradicts the multiple use, sustained yield mandate Congress has endorsed for the National Forests. Simply put, the National Forests are not National Parks. In the multiple use context and using the broadest, most discretionary terms, NFMA calls for maintenance of plant and animal community diversity. NFMA regulations acknowledge the possibility of reduction in biological diversity from that which would be expected in a pristine forest environment. Protection of resources does not automatically equate to preservation of the status quo, and ecological restoration as envisioned in the 2005 Forest Plan is not synonymous with no management or creation of a pristine environment.

PC#112 C - We feel the preferred alternative is a good balance of management direction that will achieve multiple-use resource objectives for a wide variety of interests.

PC#112 D - As noted above, MUSYA does not require that every acre of National Forest be managed for every multiple use. 16 U.S.C. Sec 531. The planning record documents the "due consideration" given to livestock grazing on the Forest. In addition, the Forest was active in contacting and listening to the views of those persons interested in livestock grazing during Plan Revision (FEIS, Appendix A, page A-3). A rangeland suitability analysis was completed (FEIS, page 3-270 and 3-271). Plan goals and objectives, as well as environmental protection (standards) were developed for grazing on the Forest (2005 Forest Plan, pages 1-6, 2-14, 2-20, 3-4, 3-8, 3-19, 3-34, 3-38, 3-46, 3-50, 3-54, 3-57, 4-12). Livestock grazing is an important part of the multiple use mix on the Mark Twain National Forest, as illustrated by the strong partnership between the Cedar Creek Grazing Association and the Forest.

Theme 3.2 - Management Intensity

PC# 45 - The Mark Twain National Forest should use an active management and conservation approach.
A) To promote a healthy and diversified land.
B) Including sustainable programs that will not sacrifice the pristine beauty of the forest.

PC# 244 - The Mark Twain National Forest should oppose timber harvesting, mining, drilling, road building, and other development.
A) And implement uneven-aged management.
B) Because the greatest good is not served in short-sighted monetary gains.
C) Because of the adverse impacts to water quality.
D) Because it promotes erosion.
E) Because forest recreation and tourism provide more jobs and income than timber harvesting.

PC#45 and PC#244 - The Forest-wide Goals (2005 Forest Plan, pages 1-1 to 1-6) clearly illustrate our intentions to manage the Forest to provide a wide variety of goods and services, in a multiple-use, sustained-yield context, and to do so in a manner that restores, maintains, and enhances the health and functioning of the natural communities present on MTNF. Both active and passive approaches to ecological restoration were considered. The selected alternative will promote a healthy and biologically diverse forest.

The 2005 Forest Plan does not authorize any site-specific decisions, but instead contains programmatic direction that will sustain ecological integrity and productivity. In Chapter 3 of the FEIS (pages 3-11 to 3-18), the conceptual framework for ecosystem management, and its application to the Mark Twain National Forest are described. Specifically, on page 3-13 of the FEIS: "Management designed to maintain or reproduce key ecosystem components, structures, and processes is the management approach most likely to sustain ecosystem integrity and productivity."

The Mark Twain National Forest's desire to contribute to the conservation of globally significant natural communities and their associated wildlife is seen in the goals and objectives statement of the 2005 Forest Plan (pages 1-1 and 1-2) and ecosystem sustainability sections of the FEIS (pages 3-10 and Appendix D). The remainder of Chapter 3 clearly shows the balance of managing the Forest while protecting the unique features that make the Ozarks such a special place.

NFMA and MUSYA require that the Mark Twain National Forest be managed in a multiple use context. Congress has already determined that the public interest in the National Forest, including the Mark Twain NF, lies in providing for multiple uses of the land, including timber, water, wildlife, range, and recreation. Neither statute mandates certain uses or prohibits harvesting, mining, or road construction. Congress has delegated tot eh Forest Service the task of determining which uses are appropriate. At the programmatic level of decision-making, the Forest has not authorized any harvesting, mining or road construction. For example, the 2005 Forest Plan does not decide when, where, or how timber will be harvested. The plan sets the proportion of probable methods of timber harvest (15 U.S.C. Sec. 1604(f)(2)), but does not dictate whether even or uneven-aged harvest methods will actually be used on the ground. Thus, in the words of the commenter, the 2005 Forest Plan does not "implement" either even or uneven-aged timber harvesting. The choice of harvest method is a site-specific decision best determined during project decision-making, with site-specific decision best determined during project decision-making, with site-specific environmental analysis.

We agree with the commenter that the "greatest good for the greatest number for the longest time" (Pinchot, Breaking New Ground, p 326 (1947)) is not well-served by short-sightedness or a focus upon monetary gain. Thus the FEIS contains an economic analysis, including the contribution of timber and recreation, that depicts the long term effects (FEIS, page 3-325 to 3-336) of the proposed programmatic framework. The 2005 Forest Plan takes a long-term, forward-looking perspective on resources and sustainability of activities that may be allowed on the Forest. The 2005 Forest Plan's provisions for protection of the soil resource (2005 Forest Plan, page 2-5) is a good example. Soil is quickly lost and takes a long time to restore. At the programmatic lee, the Forest took a hard look at the Forest-wide effects of the planning framework and disclosed those effects (FEIS, pages 3-249 to 3-265). It may be that some future project-level decisions may result in soil erosion, so the 2005 Forest Plan includes comprehensive mitigation measures to minimize adverse soil effects and ensure that the Forest is productive into the future. Future site-specific analyses will examine soil impacts and determine if additional mitigation is required to ensure that the productivity of the Forest is not permanently impaired. In the 2005 Forest Plan, the Mark Twain National Forest forged a compromise of divergent views and took a long-term view towards conservation of all resources to provide for use of the Forest now and protection of the Forest for future generations.

General Theme 4 - Alternatives

Theme 4.1 - Alternatives

PC# 2 - The Mark Twain National Forest should select Alternative 3.
A) Because of increased use of ecosystem management and prescribed burns.
B) Because it avoids motorized use.
C) Because it provides preservation and restoration of forest and wildlife.
D) Because it provides the best balance of both management and production goals for the Mark Twain National Forest.
E) Because it provides the best balance between restoration of natural communities and production of traditional forest commodities.
F) With an expansion of prescribed burning.

PC# 40 - The Mark Twain National Forest should select Alternative 1.
A) Because it would have the least negative financial and social impact on surrounding communities.
B) Because it would provide for forest and environmental health.
C) As the preferred alternative.
D) Because it offers an opportunity for restoration on a more cautionary and sensitive scale.

PC# 41 - The Mark Twain National Forest should select Alternative 2.
A) Because private forests will provide timber.
B) Because of its focus on restoration.
C) To develop more wilderness areas similar to Hercules, Devils Backbone and Paddy Creek.
D) But don't cut trees left after restoration thinning, and designate old growth in restoration areas.

PC# 44 - The Mark Twain National Forest should select Alternative 4.
A) Because it emphasizes traditional forest management over ecosystem restoration.
B) To allow for Natural Community Restoration at a more measured and proportional rate than that proposed in Alternative 3.

PC# 54 - The Mark Twain National Forest should not select Alternatives 1 or 2.
A) Because there is too much emphasis on endangered species and habitats.

PC# 145 - The Mark Twain National Forest should not select Alternative 1.
A) Because it could negatively affect wildlife species that need early successional habitat.
B) Because it does not provide for timber harvest.

PC# 146 - The Mark Twain National Forest should not select Alternative 3.
A) Because of its negative effects on wildlife.
B) Because it does not allow for enough timber harvest.
C) Because of its emphasis on pre-settlement conditions.
D) Because of its increase in the acreage of savannah.
E) Because its "single purpose" designations are not consistent with the intent of the Multiple Use and Sustained Yield Act.
F) Because it will cause economic damage to Howell County.
G) Because it will not create a healthy forest.
H) Including the creation of a pine woodland.

PC# 148 - The Mark Twain National Forest should select Alternative 5.
A) Because it provides for a sensible level of economic and social maintenance.
B) Because it will maintain recreational opportunities.
C) Because numerous acres of forest land will not be targeted for burning and allow for regeneration.
D) Because producers will be allowed more latitude when it comes to land management.
E) Because continued use of the 1986 plan will ensure the best mix of timber production, recreation, wildlife management and protection of sensitive areas and plant and animal species.
F) Because the planned management activities in the 1986 plan have not had time to take effect.
G) Because the data does not indicate that Alternative 3 is needed.
H) To provide equal treatment for a variety of multiple uses, especially timber production for commercial use.
I) Because continuation of the existing Forest Plan provides the best mix of resource management activities on the Mark Twain National Forest.
J) Including increasing existing harvest ratios.
K) Because it allows for multiple use sustained yield across all management areas.
L) To economically benefit Texas County.
M) With clarification of the true meaning of temporary openings to not exceed 40 acres.
N) With some standard of reasonable scientific interpretation in relation to endangered species prior to withdrawal of timber sales and payment of contract damages.

O) Because too many inconsistencies are found throughout the draft DEIS and the FLMP to support changing from the present management to ecosystem restoration as proposed in Alternative 3.
P) With no reduction in the average annual allowable sales quantity from the current level of 105 million board feet per year.
Q) With no restrictions regarding timber harvest or other forest use for the protection of sensitive species such as the Indiana bat.
R) With no burning of thousands of acres for hazardous fuel reduction.
S) With a standard that mandates a temporary opening shall no longer be considered a temporary opening when the stand has reached a height of 10 feet.
T) With modifications of management restrictions concerning intermittent stream areas.
U) Because it suitably addresses the leadership role of the forest in both short term and long term production of wood raw material.

PC# 149 - The Mark Twain National Forest should not select Alternative 5.
A) Because it does not focus on enough ecosystem restoration.

PC# 259 - The Mark Twain National Forest should select Alternative 3 or 4.
A) Because they address a broad spectrum of ecosystem issues, provide for sustainable forest habitat, maintain and enhance wildlife habitat, provide diverse recreational opportunities, support local economies and compliment management of adjoining state and private forest lands.

PC# 282 - The Mark Twain National Forest should not select Alternative 2.
A) Because of its emphasis on ecosystem sustainability over timber sustainability.
B) Because the ASQ would be lowered to 99 MBF/year
C) Because saw timber would be lowered to 38.5 MMBF/year.
D) Because the creation of several thousand acres of savannahs and more open forest stands will reduce timber production over the long term.
E) Because prescribed burns will damage oak stands, small stemmed trees, and be detrimental to the oak and pine forest sustainability.

PC# 356 - The Mark Twain National Forest should not select Alternatives 2, 3, or 4.
A) Because they propose restoring large acreage to natural community conditions.

PC# 357 - The Mark Twain National Forest should consider support for Alternative 2 with the following changes:
A) Do not cut trees left after restoration thinning.
B) Designate old growth in restoration areas.
C) Keep all of Lower Rock Creek in the non-motorized recreation category.
D) Reduce the Allowable Sale Quantity.
E) Allow greater uneven-aged management, including single tree selection.
F) Reduce the amount of even-aged management.
G) Better reflect conservationists' concerns and better maintenance of native wildlife viability, restoration of ecosystems, protection of special and roadless areas, protection of water quality, and provision of low-impact recreation.
H) Count woodland and savanna toward early successional habitat.
I) Address the off-road vehicle problem in the plan, not in a separate study.
J) Increase enforcement of illegal off-road vehicle use.
K) Maintain roadless areas as roadless.
L) Do not allow any new mining.
M) Close roads that cause the most erosion and habitat fragmentation.

PC# 358 - The Mark Twain National Forest should not select Alternative 4.
A) Because it allows more timber to be harvested.
B) Because less land is allocated for restoration purposes.

PC# 2, 40, 41, 44, 54 145, 146, 148, 149, 259, 282, 356, 357, 358 - Many people wrote in and voiced an opinion in clear support of or opposition to one or the alternatives presented in the Draft EIS. Many of these opinions were offered with supporting reasons. Some were written as votes, stating a position, but lacking a substantive argument. It is important to note that comments are not reviewed as if they were votes. The Forest Plan Revision process under NEPA, while open and inclusive, is not a legislative process. Each comment was individually read and reviewed by the Content Analysis team for specific content. Due to the volume of public comments, not all of the details of these comments are included here. Individual comments and public concern statements were reviewed and used by the forest specialists to revise and improve the EIS and Forest Plan between draft and final version. Examples of specific changes are noted below.

Although old growth is not designated in the restoration areas (Management Prescriptions 1.1 and 1.2), a new standard has been added to the Final Forest Plan that states "Distribute activities across the landscape to so that the full range of variable conditions (from regeneration openings to areas exhibiting old growth characteristics) is present for each natural community" This clarifies the intent to have old growth characteristics present across the landscape in Management Prescriptions 1.1 and 1.2.

Open woodlands and savannas certainly provide habitat conditions that are suitable for many shrub and some shrub/grassland plant and animal species. In recognition of that, the 2005 Forest Plan will be changed to include savannas and open woodlands as types of shrub, grass, forb habitat that are key habitat components (2005 Forest Plan page 2-7).

General Theme 5 - Timber Supply

Theme 5.1 - Suitable Lands Determination

PC# 128 - The Mark Twain National Forest should clarify whether or not all productive forest lands on slopes greater than 35% are placed in the 700 Land Use Class.

PC# 203 - The Mark Twain National Forest should not reduce acres suitable for timber production.
A) For old growth purposes.
B) Because if they were suitable in the 1986 plan, they should be suitable now.
C) Because lands in the category at risk for ecological collapse may lose their capability of being managed for a sustained timber yield.

PC# 237 - The Mark Twain National Forest should remove from the timber base the seven sensitive areas and riparian areas along perennial streams.
A) Including old growth.
B) And classify intermittent watercourses as Watercourse Protection Zones.

PC# 267 - The Mark Twain National Forest should remove ecosystems from the timber base after they are restored under management prescription 1.1 and 1.2.

PC# 128, 203, 237, 267 - The process to determine land suitable for timber management (Appendix B-4, B-5 and Figure 2) identified approximately 10,000 acres of lands with slopes greater than or equal to 35% (Land Suitability Class 700). These areas were coded as LSC 700 in the Forest's vegetation database. Only code 500 is considered suitable land for timber management. All other codes are considered unsuitable and unavailable for timber management

Figure 2 of Appendix B in the FEIS shows type of lands classed as unsuitable for timber management. Unsuitable lands include old growth, riparian glades, watercourse protection zones (IMZ on the chart) and other classes. Land Suitability Class (LSC) 700 lands are a

combination of steep slopes, isolated tracts of land with no access or economically marginal for management. Lands with slopes over 35% were identified using other methods and removed from the timber base. The remaining LSC 700 lands less than 35% slope were also removed. Although the 1986 Forest Plan designated old growth, the lands were not taken out of the suitable land base, even though timber production was not planned in these areas. The 2005 Forest Plan is correcting this error and removing old growth out of the suitable land base. In the past we have not logged in the seven sensitive areas and don't plan to in the future; therefore, to determine an accurate ASQ we have taken these lands out of the suitable land base.

Suitable timberlands are lands where timber harvesting is a scheduled management practice over a long period. Suitable lands can change for many reasons. For example, a newly identified threatened or endangered species could require more shortleaf pine old growth be removed from the suitable base to meet habitat requirements; or if industry begins using helicopter logging for lands with steep slopes, these lands may be returned to the suitable base and scheduled for harvest.

In 1986, the Forest determined the suitable timber base to be 1,282,500 acres, 88% of the forest, for scheduled timber management activities. In response to several national issues and lawsuits, the Forest conducted an analysis of suitable lands in late 1994 and early 1995. It was determined at that time 948,100 acres were suitable timber lands. These acres were reduced from the original 1,282,500 due to steep slopes, removal of designated old growth areas, riparian areas and some of the areas allocated to management prescriptions 6.1 (Sensitive Areas), 6.3, 8.1, and 9.1 (2430/1930 Letter to Regional Forester, March 3, 1995). The 1986 Forest Plan was not amended and the ASQ was not calculated on the new acre base. It was determined that this work would be done when the plan was to be revised. Although the 1986 Plan was not amended, project work recognized and used the new suitable lands. In effect, old growth areas have been out of the suitable timber base since 1995.

The ASQ for the 2005 Forest Plan Revision was determined from the suitable acres of 997,100.

Theme 5.2 - Allowable Sale Quantity

PC# 204 - The Mark Twain National Forest should reduce the Allowable Sales Quantity.
A) To avoid re-entering compartments too early.

PC# 205 - The Mark Twain National Forest should maintain the Allowable Sales Quantity.
A) Including an adoption of a more vigorous timber harvesting program to meet the Allowable Sale Quantity level called for in the current plan by marketing more "green" wood and by the salvage of trees impacted by Oak decline.
B) Including old growth.
C) Because a reduction would have a negative impact on industry and economy.
D) Including utilization of small diameter trees and harvesting dead oaks.
E) Including a tactful approach to the utilization of small round wood.
F) Including an increase in the Allowable Sales Quantity.

PC# 204, 205 - The National Forest Management Act (NFMA) gives guidance on the amount of harvesting that should occur on national forests. Section 13 of the Act limits the amount of harvest to a quantity that is equal to or less than that which could be removed annually in perpetuity on a sustained-yield basis. The ASQ is a maximum capacity of the land to growth timber volume on a long term sustained yield basis under a given management scenario (Forest Plan). ASQ is not a target. ASQ can be analyzed and recalculated at any time and applied through a Forest Plan Amendment or Revision. The capability of the land to produce timber products under a Forest Plan does not change. The circumstances and rules on

how the Plan would be implemented can change. These changes may increase or decrease the amount of volume sold, but do not change the biological capability of the land to grow trees. A description of the timber harvest scheduling analysis is found in Appendix B. As part of the analysis, all NFMA requirements are met by use of software constraints, in model construction, and in the resulting analysis.

The ASQ for the 2005 Forest Plan Revision is 103 MMBF per year. That is less than 2% under the 105 MMBF per year ASQ level of the 1986 Forest Plan. This amount of reduction equates to less than normal fluctuations in the market, and the charge that it would adversely impact Forest Products Industries and the local and state-wide economy is unrealistic.

General Theme 6 - Timber Management

Theme 6.1 - Less logging

PC# 65 - The Mark Twain National Forest should reduce timber harvesting.
A) Including clear-cutting or even-aged management.
B) Including commercial timber harvesting.
C) Because studies and polls show that tourism and ecological values take priority ahead over timber harvesting.
D) Including in restoration areas.
E) As specified under Alternative 3.
F) To recognize other uses of national forests.
G) To avoid perceptions that harvests are "compensating" for budget cuts.
H) Including even-aged management adjacent to or across recreation trails.
I) Including shelterwood.
J) Including seed tree cuts.
K) Because of the impacts of reduced oak and hickory on wildlife.
L) Because of the impacts on tourism.
M) To include only uneven-aged management.
N) Because the high levels of cutting in the new plan are recreating the conditions for the same mismanagement and opposition as the 1986 plan.
O) Including even-aged management on less than ten acres.

PC#65 - As discussed in the FEIS (pages 3-326 through 3-336) forest-related industry, which includes tourism, recreation, minerals, and wood products, are secondary industries in Missouri. In most cases, the Mark Twain National Forest is not the only source of resources upon which these industries depend. Non-market values used for this analysis are those values assigned in the 1990 Resource Planning Act Program and include many tourist and ecological uses. From an economic and social standpoint, the greatest overall benefits tend to result from a diversified base of employment and recreational activities. (See page 3-334 of the FEIS.) Many of those who provided comments under this concern are against any type of commercial harvest of timber on the National Forests, especially clear-cutting and any other form of even-aged management. The effects of Alternative 1, which has no commercial harvest of timber, were analyzed in the FEIS. Please see Appendix D Harvest Methods, response to PC#208 (Theme 6.6) for additional information on regeneration harvest methods, and response to PC#190 (Theme 6.6) for additional information on even-aged and uneven-aged management.

The size of a regeneration opening would be a project level decision. Regeneration openings include those created by uneven-aged management, which would be less than 10 acres, as well as by even-aged management, which could be up to 40 acres in size. It is expected that most clearcuts would be in the range of 15 to 40 acres. The commenter expressed concerns about the edge effect created by smaller openings. Across the eastern US, cowbirds are a

major problem for neotropical migrant songbirds, and one of the reasons they are is the fragmentation of forested habitat. However, reviewing Frank Thompson's work at North Central Forest Research Station (NCFRS) and the research they have done in the Midwest, including Indiana, Illinois and Missouri, a different picture emerges. The places where cowbirds are heavily impacting nesting neotropical songbirds are in the highly agricultural landscapes of southern Illinois and Indiana. In Missouri, where we have 70% or more forest cover, cowbird parasitism is relatively low, even for those birds that are heavily parasitized in the fragmented forests of other Midwest states. The landscape situation seems to be the determining factor in whether or not cowbirds are a big problem.

The MOFEP study also has data that seems to corroborate NCFRS data and conclusions. Our Missouri forests are theorized to be "source" populations of some species of neotropical songbirds - in other words, our birds reproduce and our excess birds go to "sink" forests in the highly fragmented landscapes of Illinois and Indiana. Sink populations do not reproduce enough to sustain their population and depend upon inputs of birds from other areas to persist. More research on nest success and bird movements is needed to substantiate this theory. MOFEP has also discovered that some "forest interior" neotropical songbirds (like wood thrush) even bring their fledglings into recent clearcuts to forage for insects.

Frank Thompson and Rick Clawson (MDC lead for bird studies on MOFEP), who many consider to be two of the leading experts in neotropical songbirds in Missouri, have indicated that a variety of regeneration opening sizes and composition are necessary to provide for the needs of many native breeding species, and that in a primarily forested landscape, cowbird parasitism is within acceptable limits. Small gaps in the canopy are preferred by hooded warblers, while blue-winged warblers and prairie warblers need the larger sized openings.

The Partners in Flight list of species of concern, as well as the US Fish & Wildlife Species of Concern for our area both include many species that depend on shrublands (regeneration openings). In fact, they are one of the groups of birds that collectively are having the greatest declines. Forest interior birds in our region are somewhat of a concern, but not nearly as much as grassland and shrubland birds.

However, across our Forest, we have a wide variety of ownership patterns, and this must be taken into consideration when deciding what types of activities are necessary or appropriate in each specific project area. Areas within the Poplar Bluff, Cassville, Houston/Rolla, and Cedar Creek units may not be within a 70%+ forested matrix.

It is not a matter of all one size regeneration harvest or none, but of careful placement, design, and consideration of what we are doing and why. Under a system of natural disturbances, there is a reverse J curve distribution of opening sizes – there are a large number of small openings created by individual tree mortality or small groups of trees that die from insect/disease/early or late frost/fire/drought/age/etc; then a moderate number of medium sized openings created by large patches of trees dying; and a small number of large openings created by high intensity and large area fires, windstorms or tornadoes. Our management should seek to imitate this pattern of disturbance in the 2.1 management prescriptions, and should express itself as we manage natural communities in the 1.1 and 1.2 management prescription areas to achieve a range of variability in structure and composition.

When deciding where and what kinds of regeneration are needed, we need to evaluate things such as where our regeneration areas are proposed in relation to the overall forest cover, and their relationship to cowbird attractants, such as pastures and feedlots. If enough small regeneration openings can be achieved through other than silvicultural treatments, that is fine. If there are enough naturally occurring small openings through oak mortality, etc., that also

would be fine. These factors would be documented in the project file when developing a proposed action and alternatives for project areas.

PC# 192 - The Mark Twain National Forest should only allow timber harvesting for the benefit of forest preservation.

PC#192 - We do not agree with this comment. Timber harvesting is used for the benefit of multiple goals and objectives. The MTNF considers markets for timber products while pursuing the goal of providing timber and wood products to help support sustainable local industry and economic interests. However, the first priority is to manage for ecosystem health and sustainability. See also response to PC# 243D (Theme 7.4).

Theme 6.2 - Cumulative Effects for Timber

PC# 69 - The Mark Twain National Forest should reconsider the increased use of chip mills.
A) Because the current number of chip mills is adequate.
B) Because they are not an appropriate use of forest resources.
C) Because of forest impacts.

PC# 158 - The Mark Twain National Forest should address the impacts of public and private lands timber harvesting on wildlife, and the Forest's timber production on non-timber forest products in their cumulative effects analysis.
A) In determining forest management priorities.
B) On middle and late successional stages.

PC#69 and 158 - A survey of the special forest product program was conducted on the MTNF in 1999. This survey showed a negligible number of permits issued for non-timber forest products.

The Annual ASQ for the 2005 Forest Plan is 103 MMBF. Of that, 43.5 MMBF is sawtimber. The remaining 59.5 MMBF is small roundwood. Much of the roundwood product on the forest is not currently being utilized. Full production of the two existing chip mills would likely utilize a large amount of these products and help reduce stocking as well as aid in tree species management. Since sawtimber prices are much greater than roundwood prices, it is not likely that sawtimber products would be sent to chip mills now or in the foreseeable future (See pges 3-47 and 3-48 in the FEIS).

The FEIS discusses timber removals on all land ownerships. The number and kinds of mills that should or should not be in Missouri is outside the scope of this analysis. The FEIS does discuss the number and types of mills that exist and changes to the number and types since 1946. Overall, net annual growth on all ownerships of timberlands, in Missouri from 1989 through 2003, exceeds both mortality and removals.

PC# 501 - The Mark Twain National Forest should address the impact global warming will have on the ecosystem of the forest.
A) In order to make decisions regarding timber harvesting practices.
B) In order to make decisions regarding biodiversity monitoring.

PC#501: See response to PC# 318 (Theme 25.3)

Theme 6.3 - Commercial harvest

PC# 17 - The Mark Twain National Forest should prevent resource damage as a result of commercial timber harvest.
A) Because lumber companies have a much bigger impact on the forest than off-road vehicle users.

PC#17 - Standards and Guidelines in the 2005 Forest Plan insure protection of the forest, including the streams and ecology of the area. The forest would not be managed for short-term monetary gains. The main premise in developing the Allowable Sale Quantity is sustained yield.

The Forest Service manages for multiple-use objectives such as diversity of plant and animal communities, recreation, conservation of soil and water resources, and threatened and endangered species, as well as production of forest products.

PC# 206 - The Mark Twain National Forest should allow commercial timber harvest on public lands.
A) Including harvest of dead and dying timber to reduce beetle infestations and fuel hazards.
B) Because it provides employment and business opportunities.
C) Because it helps pay for road development and maintenance which provides for visitor access and enjoyment of national forests.
D) Because it provides for fuel reduction and for maintaining healthy, vigorous stands of timber, and for the greatest diversity and health of animals.

PC#206 - The 2005 Forest Plan does allow commercial harvest of timber, including salvage of dead and dying timber (See Salvage on page 2-27).

PC# 207 - The Mark Twain National Forest should not allow commercial timber harvest on public lands.

PC#207 - Alternative 1 has no commercial harvest. Alternative 1 was considered in detail in the FEIS.

PC# 279 - The Mark Twain National Forest should address what will happen if they cannot sell the small wood proposed in Alternatives 2 and 3.

PC#279 - The effects of intermediate thinning are described in the FEIS (See page 3-55). In Alternative 1 where only a small amount of intermediate thinning is projected, stands in the rest of the forest would become overstocked and would stagnate. Forest health and species diversity would decline. The effects would be much the same in Alternatives 2 and 3 if markets for wood from intermediate thinnings do not exist and cannot be developed, and funding to do the work cannot be secured. Efforts would be made to develop markets that could take advantage of this resource and enable the achievement of intermediate thinning activities, or to accomplish this work in other ways.

PC# 379 - The Mark Twain National Forest should address threats to forest health in a timely manner.

PC# 383 - The Mark Twain National Forest should support a plan that allows harvesting of mature and dead timber and allows thinning, including prescribed fire.
A) For hazardous fuels reduction.

PC#379, PC#383 - Alternatives 2, 3, and 4 strive to restore and maintain healthy ecosystems and provide a healthier balance of shortleaf pine and white oak. This includes the use of timber management activities and the use of prescribed burning. Decisions on oak decline and forest health management actions would be made after site-specific evaluation.

The 2005 Forest Plan does allow commercial harvest of timber, including intermediate thinning and salvage of dead and dying timber (See Salvage on page 2-29). Forestwide Standards and Guidelines on 2-29 of the 2005 Forest Plan state the following: "Salvage timber resources damaged by natural or man-caused disturbance events when salvage activities are compatible with overall resource goals and objectives, management prescriptions, or to protect public safety."

PC# 397 - The Mark Twain National Forest should make sawlog production a priority.
A) In order for the Mark Twain to meet its responsibility for significant contribution to the ecological and economic well-being of the region.

PC#397 - One of the goals of timber Management on the Mark Twain is to provide timber and wood products to help support sustainable local industry and economic interests. However, the type of wood products removed from the Mark Twain depends on the individual project objectives. Sawtimber is the most removed product followed by small roundwood. Stands in the sapling, poletimber and small sawtimber (< 11 inches DBH) classes need to be thinned. Thinning allows species selection, and trees will grow to sawtimber size in a shorter time period when thinned.

PC# 503 - The Mark Twain National Forest should carefully examine the long-term marketing potential, for both oak and pine, and plan their timber management prescriptions accordingly.

PC# 503 - The MTNF will consider markets for timber products while pursuing the goal of providing timber and wood products to help support sustainable local industry and economic interests, along with other multiple use goals and objectives.

Theme 6.4 - Salvage

PC# 88 - The Mark Twain National Forest should salvage burned and storm-damaged timber and require payment for the value of the timber from anyone who tries to stop the salvage.
A) Because salvaging the timber is an emergency situation.

PC# 201 - The Mark Twain National Forest should add a provision to Alternative 5 to allow for dealing with emergency timber sales.
A) Because failure to deal with emergencies leads to a loss of jobs, product, and money.
B) Including salvage activities.

PC#88, PC#201 - It is beyond the scope of this analysis to set Forest Service policy on salvage. The Mark Twain must follow Forest Service policy during emergency situations, no matter which alternative is chosen. This policy is set forth in Forest Service Manual 2400 – Timber Management, Chapter 2430 – Commercial Timber Sales, Section 2435 – Salvage Sale Program.

PC# 184 - The Mark Twain National Forest should clarify if salvage timber harvesting would count towards the 20 percent limit specified in Management Prescription 1.2.

PC#184 - It is clearly stated on page 3-9 of the 2005 Forest Plan that "Salvage harvests are not subject to the 20% limit on timber harvest." Salvage harvests are not scheduled. It is possible that in a particular management area there would be no salvage during the plan period. However, catastrophic events such as tornados, fires, insect and disease outbreaks, etc, could occur. Salvage harvests may be necessary to prevent the spread of insects or disease, to reduce fuels and decrease the risk of wildfire, to address safety concerns from falling trees and branches, and to salvage forest resources.

There is a limit of 20% in Management Prescription 1.2 for "scheduled" timber harvest during each decade of the plan period. These timber harvests are scheduled to help move the forest towards the desired condition, and address concerns such as natural community restoration, wildlife needs, etc, which may or may not be met by salvage operations.

Theme 6.5 - Even-age Management (EAM)

PC# 124 - The Mark Twain National Forest should avoid prematurely clear-cutting next to past clear-cuts.
A) By using an age of 15 years to declassify temporary openings.

PC#124 - The standard that describes the requirement to declassify temporary openings has been changed in the Final to read as follows: A temporary opening shall no longer be considered a temporary opening when the stand has reached a height of 15 feet**.** We amended the height from 10 to 15 feet in response to the concerns that 10 feet high might still be perceived visually as an opening and could lead to too many adjacent regeneration cuts.

PC# 398 - The Mark Twain National Forest should use the shelterwood method for timber harvest.
A) Because it retains the greatest canopy coverage, thereby retaining the opportunity for capturing future growth on residual trees, retains some structural integrity of the canopy, meets multiple wildlife habitat goals, and is the least aesthetically objectionable of the even-aged management regeneration cutting methods.
B) Including variations that retains a large tree component in a stand while opening the stand for new growth

PC#398 - The Mark Twain does plan to use the shelterwood method where appropriate. The shelterwood system as practiced on the Mark Twain is technically a two-aged system because of the amount of reserve trees and reserve tree groups that are retained in the stand. Forestwide Standards and guides require a minimum of 7% to 10% of all even-aged harvest units to be retained as reserve trees.

Theme 6.6 - Uneven-age Management (UAM)

PC# 123 - The Mark Twain National Forest should not refer to cuts less than or equal to two acres as regeneration.

PC#123 - Regeneration cuts less than or equal to 2 acres on the MTNF would normally be part of a stand managed under the group selection method. "In group selection trees are removed and new age classes are established in small groups. The width of the groups is commonly approximately twice the height of the mature trees with smaller openings providing conditions favorable for tolerant regeneration and larger openings providing conditions suitable for more intolerant regeneration" (Dictionary of Forestry published by the Society of American Foresters).

PC# 126 - The Mark Twain National Forest should restrict the use of uneven-aged cutting to 6.3 and recreation areas.

PC#126 - Uneven-age timber management is a tool that can be used throughout the forest as needed as a result of analysis. The guideline refered to by the commenter encourages use if needed to achieve riparian management goals and to minimize damage to riparian habitats.

PC# 190 - The Mark Twain National Forest should consider practices used by Pioneer Forest and discussed in related papers and reports.
A) Including timber harvest methods.
B) Because they are profitable and advantageous.
C) Including not using seed-tree cutting.

PC#190 - The Mark Twain has considered practices used by Pioneer Forest. In fact, one of the Timber Management Goals of the current plan was to "Apply and evaluate the uneven-aged management system on selected areas to determine the long term feasibility of using this system for management on the Forest." A Vegetation Management Review was conducted on the Forest in 1994 by a team of scientists. Review Team members included Dr. Paul Johnson and Dr. Frank Thompson, USDA Forest Service North Central Forest Experiment Station; Dr David Graney, USDA Forest Service Southern Forest Experiment Station; Dr. Ernie Wiggers and Dr. David Larson, University of Missouri; and Douglas Ladd, The Nature Conservancy. The report concluded that single tree selection as implemented by Pioneer Forest may entail risks unacceptable to the Forest Service. The report recommended that group selection should be the method of choice when uneven-aged management was implemented on the Mark Twain. During the 17 years of management under the 1986 plan, we have applied uneven-aged management regeneration harvests to 66,593 acres, or an average of 3,917 acres per year. The effects of even-aged and uneven-aged management are analyzed on page 3-51 through 3-52 of the FEIS. The 2005 Forest Plan contains no restrictions or requirements on the type of regeneration method that must be used. Decisions on the type of management will be made at the project level, and will be based on a site specific evaluation of stand conditions, management objectives, natural community type, and desired condition.

There are many differences between Pioneer Forest and the Mark Twain National Forest. The Forest Service works under NFMA (National Forest Management Act) and its implementing regulations. The Forest Service must also follow direction in Forest Service Manuals and Handbooks in all aspects of its management. Multiple-use goals, objectives, management area prescriptions, and standards and guidelines all define the Mark Twain National forest's management direction. In addition, site conditions on Pioneer Forest differ from those on the Mark Twain National Forest. In the opinion of the managers of Pioneer Forest, their lands were always closed forests, rather than the closed or open woodlands that make up a large part of the Mark Twain. They also believe that their lands were never cut over during the early 20th Century but were purchased as "virgin forest," and therefore not subject to many of the abuses suffered by the lands acquired by the US Forest Service to become the Mark Twain National Forest.

In the interior highlands, not all stands are suitable for application of uneven-aged silviculture. Of stands that are ecologically suitable for conversion from even-aged to uneven-aged condition, efficiency of conversion depends greatly on stand condition at the beginning of the conversion process (Loewenstein and Guldin 2004). For example, some landowners in the region, most prominently the Pioneer Forest in Salem, MO, have had great experience in creating well structured uneven-aged upland oak stands, but these stands had their origin largely as poorly stocked cutover stands that were rehabilitated through judicious tending or residual growing stock (Loewenstein 1996, Loewenstein and others 2000).

There are some who would prefer that the Mark Twain National Forest use only uneven-aged management, as practiced by Pioneer Forest. Others, however, prefer that the Forest use only even-aged management. NFMA simply requires that land and resource management plans contains the "proportion of probably methods of timber harvest within the unit necessary to fulfill the plan." 16 U.S.C. Sec 1604(f)(2). NFMA does not require that timber harvest

methods be chosen at the forest plan level. Thus, the 2005 Forest Plan does not authorize any timber harvest, nor does it decide when, where, or how timber will be harvested. The 2005 Forest Plan considers a full spectrum of silvicultural methods, recognizing that local decision-makers need the discretion and flexibility to choose the most appropriate method during future project development. Using site-specific data and analysis and after further public involvement, the Forest will determine what the appropriate harvest method is for each site-specific proposal. The 2005 Forest Plan does not prohibit or authorize harvesting in accord with the methods used by Pioneer Forest; it merely established the framework for future decision-making. The planning record documents the Forest's hard look at the methods and results of Pioneer Forest.

PC# 208 - The Mark Twain National Forest should reduce even-aged management and focus on uneven-aged management.
A) To provide higher quality and more permanent early successional habitat.
B) Because single-tree selection is sound, environmentally sensitive, sustainable, and more economically productive than even-aged management.
C) Because although short term costs of even-aged management seem lower, the long term costs are higher.
D) And not use plan habitat goals as an excuse for practicing even-aged management.
E) Including a reduction in the amount of even-aged management in restoration areas.
F) Because it allows individual species as well as individual trees to fully develop and mature within the forest.

PC# 209 - The Mark Twain National Forest should use even-aged management.
A) Only for restoration purposes.
B) To manage Oak-Hickory forests.

PC#08 and 209 - Some comments under this concern indicate a basic misunderstanding of the 2005 Forest Plan and the FEIS. To begin with, even-aged management has been practiced on the Mark Twain for many years, even though one comment suggests abandoning plans to introduce clear cutting and even-aged management to the Mark Twain.

One comment suggests "To do away with the current ban on clear cutting would be a mistake." There is no "ban" on clearcutting and none is expected in the future. However, direction in the Forest Service Manual 2400 – Timber Management, Chapter 2470 – Silvicultural Practices 2471.11 states "Apply clearcutting only where it has been found to be the optimum method of regeneration to meet multiple use objectives."

The 2005 Forest Plan's focus on restoring natural communities is not being used to justify removing existing restrictions on clearcutting, and removal of those restrictions is not a goal, as charged in one of the comments. Restrictions on clearcutting in the 2005 Forest Plan remain the same as those in the 1986 Forest Plan.

There are no plans to do away with selective cutting (uneven-aged management) as one comment states. However, there are plans to drop some management prescriptions in the 1986 plan that requires the use of uneven-aged management in certain areas.

One comments states that "clearcutting and similar logging methods would more than double, from an average of 4305 acres/year from 1990 to 2004 to a projected 11,270 acres per year." These projected acres in the 2005 Forest Plan include all types of regeneration harvests, and represent an increase of less than 1% from the projections in the 1986 Forest Plan. It is important to understand that these projections assume full funding levels, and don't take into account circumstances such as the discovery of cultural resources to be protected, appeal of NEPA documents, natural catastrophes such as wildfires and tornados, and a myriad of other situations that could arise. It is also important to realize that the projections do not determine the amount of even-aged or uneven-aged management. Although there are some comments

listed under this concern that urge the USFS to use the even-aged management process to manage our Oak-Hickory forests, we recognize that many who commented under this concern would prefer reducing or eliminating even-aged management and moving towards the exclusive use of uneven-aged management. However, we do not believe that would be appropriate. Under the Timber Management standards and guidelines on page 2-27 it is stated: "Use silvicultural systems, harvest methods, and intermediate treatments to move the forest towards the desired condition. Base the decision on which type of systems, methods, and treatments to use on a particular site on management objectives, natural community type, stand conditions, and the silvical characteristics of the species present or desired." The focus is not on any particular type of management, rather it is on the type of management that would be best for a particular site.

Theme 6.7 - Forest Health/Oak Decline

PC# 60 - The Mark Twain National Forest should reconsider using oak decline as a reason for timber harvest.
A) Because oak decline is part of the natural process of succession.
B) Including salvage timber harvesting.

PC#60 - Some have commented that the Forest Service needs to cease its program of salvage logging in response to the phenomenon of oak decline because they believe oak decline is part of the natural process of succession. They further believe that the natural process of succession should be allowed and would cause no threat to the health of the forest if left alone. Others comment that the Forest Service needs to continue its program of salvage logging, and they believe oak decline is clearly not part of the natural process of succession.

Forestwide Standards and Guidelines on 2-29 of the 2005 Forest Plan state the following: "Timber resources damaged by natural or man-caused disturbance events should be salvaged when salvage activities are compatible with management prescriptions or to protect public safety."

PC# 134 - The Mark Twain National Forest should consider that to revegetate forests with red and black oaks is to set them up for oak decline in the future.

PC#134 - The 2005 Forest Plan would strive to restore and maintain healthy forest ecosystems and provide a healthier balance of shortleaf pine and white oak (see page 3-57 of the FEIS). See also response to PC# 3 (Theme 1.18).

Theme 6.8 - Measuring units

PC# 66 - The Mark Twain National Forest should review the consistency of harvesting measurement units in the Draft EIS.

PC#66 - Forest Service direction requires the use of cubic foot volume in all timber sales.

PC# 263 - The Mark Twain National Forest should compare timber harvest acreage using volume not acreage.
A) Including methodology used to obtain calculations and numbers.

PC#263 - In uneven-aged management the area under management is considered for regeneration or improvement cut during each cycle. Depending on site-specific conditions, approximately 15 to 20% of the unit would be harvested for regeneration each cycle. However, trees on the entire area would be subject to improvement cuts to meet stocking objectives. For example: when an entry to a 200-acre area under uneven-aged management is prescribed, the entire area is coded as an uneven-aged harvest.

In even-aged management, an intermediate thinning on 40 acres would be considered a commercial thinning harvest of 40 acres—even though only a percentage of the total trees in the stand would normally be harvested.

In even-aged regeneration harvests, the entire stand would be counted. For example: a 30-acre clearcut would be counted as a 30-acre sale—even though reserve trees would remain in the stand.

The commenter continues with the question "What evidence does the Forest Service has that these ecosystems can be recreated with these changes to the land." There is compelling evidence that the restoration work proposed by the 2005 Forest Plan will work. However, in some cases the land may be so degraded that restoration is not feasible at this time considering available funding and personnel. The Mark Twain will concentrate restoration efforts in appropriate areas that are selected based on conservation assessments and data that point to those areas of the Forest that conserve the best, most viable arrays of ecosystems, plants, and animals (See Ecological Sustainability and Ecosystem Health beginning on page 3-59 of the FEIS).

Theme 6.9 - Prices used

PC# 71 - The Mark Twain National Forest should reconsider its use of Missouri Department of Conservation timber prices.

PC# 71- The analysis described in Appendix B is a snapshot of prices and conditions. The Missouri Department of Conservation provides quarterly price information and trends in its 'Missouri Timber Price Trends' publication. These reports include Forest Service timber sale data and are a general guide for determining market value of timber for a reporting region.

The Forest's base price information is by species, for 3 zones. Prices are pro-rated to the species and volume identified in a sale and used, along with other factors, to appraise a timber sale's value. This appraised value is what is advertised for sale to the public. The Plan's analysis is programmatic and uses average values and volumes. The Missouri Department of Conservation provides average pricing information, by region, each quarter of the year for timber sale sold during that quarter. These prices generally reflect market conditions and are a better reflection of average prices for a programmatic analysis.

Theme 6.10 - Use horses

PC# 211 - The Mark Twain National Forest should increase the use of horses for timber harvest.

PC# 211- There are no restrictions on horse-logging on the Mark Twain National Forest. Some sales on the Mark Twain require the use of draft animals for skidding, but these sales are the exception rather than the rule. Timber purchasers may use draft animals rather than mechanized equipment as long as all contract specifications are met.

Theme 6.11 - Thinning

PC# 59 - The Mark Twain National Forest should consider thinning to manage overgrown trees.
A) To control soil erosion and return nutrients to the soil.
B) For use as biomass fuel.

PC# 59 - The Mark Twain National Forest has considered thinning. See Appendix E-3 for projected amounts of pre-commercial thinning and release, and commercial thinning.

Theme 6.12 - Timber Management Standards and Guidelines

PC# 332 - The Mark Twain National Forest should change goals, standards and guidelines and review policies regarding Timber Management.
A) By changing a standard to increase the area size in which timber harvest activities would be prohibited within the prohibition edge of a sinkhole, cave entrance, or within the buffer zone for wetland features.
B) And consider that trying to say that clear-cutting is not even-aged management is dishonest and deceptive.
C) Because the amount of proposed timber harvest and Allowable Sale Quantity is too high.
D) Including restoration and salvage timber harvesting considered as part of the Allowable Sale Quantity.
E) Including a standard to address timber theft.
F) Including changing the standard to only allow non-commercial timber harvest in Riparian Management Zones.
G) Including consideration of single tree selection conducted by Pioneer Forest.
H) Including prohibiting commercial timber harvesting.
I) By making a guideline for what to base systems, methods, and treatment on a standard.
J) By making guidelines for reserve trees into standards.
K) By making the guideline for Regional Forester approval of large temporary openings a standard.
L) By making guidelines for temporary opening considerations standards.
M) By not allowing temporary openings by trails.
N) To prohibit the use of genetically improved seed or stock.
O) Including prohibiting salvage timber harvesting.
P) By removing a guideline allowing salvage when timber resources are damaged and adding a standard to allow nature to take its course when natural events occur.
Q) By changing a standard to prohibit salvage in old growth.
R) Including a discussion of why the way Pioneer Forest is successfully managed is not being considered for the Mark Twain.
S) Including a discussion of what impact different cutting methods have on visual quality, salamanders, soils, and other environmental impacts.
T) By explaining the claim that timber management activities are necessary to move the forest toward the Range of Natural Variability.
U) By addressing changes to soils and hydrology.
V) By addressing an alternative that prohibits grazing.
W) Including goals for regeneration.
X) Because standards and guidelines regarding oaks are too restrictive and do not recognize differences across ecological land types.
Y) By revising Goal 2.4 to scale the quantity of timber and wood products harvest to a sustainable level and that is in consonance with and complementary to the elements of Goal 1.
Z) Including a discussion on how timber management might differ from the past under the new ecosystem management paradigm.

PC#332A - We believe the standards and guidelines as written provide adequate protection to these features (see pages 2-10 through 2-13 of 2005 Forest Plan).

PC#332B - The Forest Service is not trying to "get around" NFMA's limitations on the size of openings created by even-aged management. The Forest Service is not being dishonest or deceptive, or trying to cover up what it is doing by playing word games. These concerns are clearly addressed in Appendix D of the Forest Plan.

PC#332C - Please see Appendix B of the FEIS. The ASQ is the estimated volume that can be harvested in each decade on a long term, sustained yield basis from suitable lands. Timber

management activities are not scheduled on unsuitable lands. However, timber management activities could take place on unsuitable lands to meet other resource objectives, such as improving habitat for threatened, endangered, or sensitive species; enhancement of natural communities; or salvage when salvage activities are compatible with management prescriptions or to protect public safety.

PC#332D - Logging for restoration on suitable lands would be scheduled timber management activities and as such would contribute to ASQ. Salvage activities would not be scheduled. Salvage would only occur as a result of events such as fires, windstorms, insect and disease outbreaks, etc. and would not contribute to the ASQ

PC#332E - Timber theft is addressed in Forest Service Handbook for Timber Sale Administration 2409.15 and in the Law Enforcement Handbook 5309.11.

PC#332F - The standard as written prohibits Timber Management in the RMZ's (unless needed to move toward the desired condition or for some salvage). This standard, and other standards and guidelines listed on 2-3 and 2-4 of the 2005 Forest Plan, would greatly limit timber management activities in the RMZ's. However, it would have the flexibility to allow commercial harvest to accomplish management activities.

PC#332G and R- Please see response to PC#190 (Theme 6.6)

PC#332 H - The effects of Alternative 1, which has no commercial harvest of timber, were analyzed in the EIS.

PC#332I - We believe it is appropriate for this guideline to remain as written. See 2005 Forest Plan, Preface-2 for a description of Forestwide Standards and Guidelines.

PC#332J - The Standard is that all even-aged regeneration harvests shall retain at least 7% to 10% of the harvest unit in reserve trees and/or reserve tree groups. The type of reserve trees and reserve tree groups to include should remain a guideline to account for site specific variation.

PC#332K - The standard is the following: "The maximum size of a temporary opening created by an even-aged regeneration harvest is 40 acres except as provided for in Management Prescriptions 1.1 and 1.2 or as noted below." Regional Forester approval on an individual sale basis after 60 days public notice is one of the exceptions.

PC#332L - We believe it is appropriate for this guideline to remain as written. See 2005 Forest Plan, Preface-2 for a description of Forestwide Standards and Guidelines.

PC#332M - The standard in the 2005 Forest Plan states, "Not more than 10 chains (660 feet) of temporary opening may occur along any 40 chains (0.5 miles) of a hiker or horse trail (including the Ozark Trail) during a decade." This is basically the same language as the 1986 Forest Plan, which we believe is adequate for trail protection.

PC#332N - The "genetically improved" seed that would be used was developed from native trees on the Mark Twain National Forest. Candidate native trees were located and evaluated for superior qualities, such as straightness and form, insect and disease resistance, and other quality characteristics. The top candidates were chosen to be part of a tree-improvement breeding program to provide quality seed for reforestation of National Forest land.

PC#332O, P, Q - We do not agree with statements such as "salvage logging should be prohibited" or "Timber resources are not damaged by natural events." Standards and guidelines in the Draft Plan will ensure the forest is not damaged by salvage logging, while utilizing timber resources damaged by catastrophes (see Salvage on page 2-29 of the 2005 Forest Plan).

PC#332 S - See response to PC#332U (Theme 6.12) and PC#200 (Theme 18.3). The EIS does not ignore the impacts of forest management to salamanders. Six salamanders were included in the Species Viability Evaluation, summarized on pages 3-62 and 3-129 through 3-160 of the EIS. Several references pertinent to Missouri Ozark ecosystems were consulted during this analysis, and the ecosystem approach used in the 2005 Forest Plan was found to provide suitable habitat, well distributed throughout the Forest for these species. Several standards and guidelines were developed specifically to provide certain habitat conditions favored by various salamander species; including provisions for downed woody material near waterholes and during forest management activities, old growth designation, maintenance of fishless waterholes for breeding, and creation of vernal (temporary) pools when maintaining roads. Potential impacts of specific treatments would be described during site-specific project analysis.

PC#332 T - See response to PC#3 (Theme 1.18).

PC#332 U - The analysis does address the impacts of logging on the soils and hydrology at a programmatic level. The general impacts of timber management activities are discussed on pages 3-257 through 3-259, 3-239 through 3-241. In general, timber management practices can possibly impact an area through increased erosion and compaction, and soil productivity can be altered. Standards and guidelines have been developed to minimize any adverse affects to the soil and water regimes of the Mark Twain National Forest, while providing opportunities to enhance and restore the ecosystem. Site-specific responses will vary based on types of harvesting systems employed as well as the actual site conditions; these aspects would be addressed and evaluated during project level analysis.

PC#332 V - See response to PC#75 (Theme 15.1) and PC#269 E (Theme 19).

PC#332W - Goal 2.4 has been edited to read as follows, "Use timber management, where appropriate, to restore or enhance degraded natural communities, sustain healthy and productive forests, and reduce hazardous fuels to reach the desired condition of the forest."

PC#332X - We believe the Standards and guidelines are appropriate.

PC#332Y - All NFMA requirements are met by the spectrum models use of Non-Declining Yield (NDY), Long Term Sustained Yield (LTSY), Perpetual Harvest and ASQ<=LTSYC Link constraints. Please see Forestwide Standards and Guidelines, and Appendix B of the FEIS.

PC#332Z – Please see Timber management section starting on 3-51 of the FEIS.

PC# 349 - The Mark Twain National Forest should give greater attention to stand structure and regeneration in the plan.
A) Because they are key to forest sustainability, wildlife habitat, and forest health.
B) Because they can be used to achieve many of the restoration goals, and can have significant impacts on how and when fire is used.
C) Including allowance for more site specific or ELT prescriptions rather than broader landscape or LTA prescriptions.

PC#349 - See Introduction under Forestwide Standards and Guidelines on page 2-1 of the 2005 Forest Plan.

See Goal 2.4 Timber Management, which has been edited in the final to read, "Use timber management, where appropriate, to restore or enhance degraded natural communities, sustain healthy and productive forests, and reduce hazardous fuels, to reach the desired condition of the forest."

General Theme 7 - Ecosystem Management

Theme 7.1 - Passive Management

PC# 43 - The Mark Twain National Forest should protect and restore natural ecosystems and ecosystem processes.
A) To maintain native wildlife viability.
B) To restore ecosystems.
C) To protect roadless areas.
D) To provide low impact recreation.
E) To provide habitat for the Ivory billed woodpecker.
F) Including Terrestrial Natural Communities.
G) By using fire for site-specific restoration.
H) To pre-European settled conditions.
I) Not using even-aged management or repeated burning.

PC#43 A, B, C, D - Many commenters believe that a "passive approach" to various forest management and public use activities is the best way to sustain forest health, productivity, species viability, biodiversity and quality recreational experiences. The Multiple-Use/Sustained Yield Act and National Forest Management Act allows for maintenance of various types of forest roads, silvicultural practices, prescribed burning and livestock grazing on a sustained yield basis. These vary by goals, objectives and management prescription standards and guidelines. Management Prescription's 1.1 and 1.2 delineate 438,000 acres of the Mark Twain National Forest toward emphasis on intensive ecosystem restoration. These decision items respond to the need for change issues regarding loss of fire-adapted natural communities, restoration of shortleaf pine woodlands and recovery of wildlife associated with now diminished habitats. As the FEIS indicates (pages 3-70 through 3-73), the majority of lands administered by the Mark Twain National Forest are out of Historic Range of Variability for healthy functioning ecosystems. Ecosystem restoration or enhancement (as outlined in the FEIS) requires characterization of desired conditions compared to today's current conditions. Because proven trial and error ecosystem restoration in the Midwest requires intensive work, the Mark Twain National Forest (as do other federal, state, local governments and private conservation organizations) must employ a strategic conservation strategy for prioritizing ecosystem restoration efforts. The FEIS discloses the effects of both passive and active restoration. Passive restoration may apply to a few Missouri natural communities. Forest management activities are conducted in a manner that mitigates any degradation while enhancing or restoring forest health. Passive restoration can be employed alone in lieu of or prior to active restoration providing select natural communities are moving toward desired conditions. We point to the efforts of the Mark Twain National Forest, Missouri Department of Conservation, Missouri Department of Natural Resources, Missouri Prairie Foundation and The Nature Conservancy—all which employ a variety of active management techniques to overcome the threats and dysfunctions of degraded ecosystems. Certain exceptions might occur where passive actions include closure of trails, old roads or postponement of prescribed burning where long burn intervals occur (for certain bottomland or mesic upland forest types).

PC#43 B, E, F & H - The MTNF has reviewed the ecosystem concepts referenced in Angermeier and Karr (Bioscience Vol. 44 No. 10, 1994) and have incorporated it in the FEIS. In response to F and H, the intent of achieving the ecosystem restoration goal is to consider desired conditions in the context of pre-European natural communities as explained in Chapter 3 under Ecosystem Sustainability. In response to E, the 2005 Forest Plan provides for the restoration of old growth bottomland hardwood forests along riparian zones. However, the Mark Twain National Forest contains little, if any, suitable habitat for the Ivory-billed

woodpecker since historically it primarily inhabited swamps in southeastern Missouri (Jacobs 2001).

We believe the 2005 Forest Plan Conceptual Framework for Ecosystem Management (FEIS and 2005 Forest Plan Summary) captures the vision of restoring ecosystems based on contemporary ecosystem restoration principles. Such an approach, the revised standards and guidelines and new management prescriptions are designed to enhance forest health, restore ecosystems, and improve water quality.

PC#43:- A, G, H, I: We agree that the fine-grained Guyette study for the Current River continues providing valuable information and evidence regarding the significance of fire and its application to resource management. However, we also recognize its limitations. Guyette et al (2002), which is cited by the commenter, also states that "Anthropogenic, or human-caused, fire has influenced ecosystem processes for millennia, and at broader scales has been an important determinant of landscape character….(with several citations)" Guyette references a "strong correspondence" between human population density based on the number of archaeological sites. At least 45,000 archaeological sites are recorded across Missouri; thus, the Guyette research does not discount any fire at all prior to Native American migrations into the Current River region. Further, Guyette qualifies the application of the four stages identified by their research as limited. They cite the example of their fire histories for an oak savanna in Missouri where continuous fine fuels contribute to a consistent mean fire interval, with no population effect evident before Euro-American settlement. They state that fire frequency tends to be independent of human population density. How the Mark Twain National Forest will use this information, and other evidence/experience in restoring ecosystems, will be adapted to disturbance variations occurring across different landscapes. For example: Guyette fire frequencies are taken into consideration for the Current River Hills, but other factors dictating how fire will be applied include vegetation, management indicator response in moving toward desired conditions.

Other limitations to fire scar research exist. Fire scars alone do not necessarily equal fire frequency (Pyne 1984). Whether a tree registers a fire scar depends on varying fire intensities. A fire of greater intensity would kill or consume a tree while less intense fires may not register scars in certain years. Low intensity ground fires moving through fine grasses (especially frequent fires) would have not produced widespread tree scarring. Additionally, most of the signature trees that contained fire scar data are today gone due to the nearly complete clearcutting of Missouri's original forests, woodlands and savannas. Even relict trees predating the effects of European settlement are rare. At best, fire scar data is only one piece of information in formulating fire regimes, and perhaps offers a conservative estimate of actual fire frequency. Other additional studies examine charcoal in bogs (King and Allen 1976), pollen in sinkhole ponds (Denniston et al. 1998), presence of open land-adapted wildlife (Bielmann and Brenner 1951) botanical studies (see history and list of floristic studies in Yatskievych 1999) and the role of lightning (Nelson 2005). Ecologists, through experimental burning, have concluded that vegetation and wildlife contain ecophysiological fire-adapted characteristics. Simply stated, we know that frequent burning is needed to maintain prairies, savannas, pine and oak woodlands, glades and other Missouri natural communities.

Further, we disagree with reference to a "few 19th century written accounts" providing that few references a small number. The number of accounts is quite extensive as chronicled by Bielmann and Brenner (1951), Ladd (1991), Nigh (1992), Nelson (1997), Nowacki (2002), McClain and Elzinga (1994), Williams (2000) and Pyne (1982) among others. These references contain many additional citations on the role of Native Americans and their use of historical fire.

Current activity projections estimate that the total area subject to one or multiple burns for purposes of restoring natural communities would be 79,800 acres (see Table E-3 of Forest Plan). Much of the 78,404 acres also subject to Hazard Fuels Treatment-Mechanical will likely overlap with the 79,800 acres. This amount of annual burning represents about 1.6% of the Mark Twain National Forest.

The 2005 Forest Plan incorporates an added standard under the Wildlife Management section of MP 1.1 and 1.2. It says that activities will be distributed across the landscape so that the full range of variable conditions is present for each natural community, and that the predominant age of areas representing old growth character should be at least 25% above the rotation age. A significant amount of older age classes will be balanced with other variable age groups of vegetation to mimic historical natural communities.

PC#43 G - As explained in the FEIS, many of these former fire-adapted natural communities are underrepresented due to post-European overexploitation of resources and fire suppression. A variety of environmental and ecological assessments point to the now relatively rare and threatened vegetation assemblages and their associated species of conservation concern. The FEIS has listed these contemporary assessments on 3-61. We cannot ignore assessments and characterization of the biological component. Too many plant and animal species (including endemics, relicts, disjunct, characteristic and restricted plant and animal species) occur in suites or assemblages that are adapted to fire-mediated natural communities. The 1982 Planning Regulations (CFR 219.19) require that Forest Plans provide direction to manage fish and wildlife habitat to maintain viability of populations of plant and animal species on national forest lands. The ecosystem sustainability approach covered in Appendix D provides the rationale and methodology for how the Forest Plan revision will satisfy this requirement. As the conservation assessments and other documents (also see Appendix D-2) substantiate, the Mark Twain National Forest contains globally imperiled natural communities and habitats that, without management, would continue to degrade (see Affected Environment page 3-64 of FEIS) and result in the continued loss of biodiversity. In response to the comment regarding limited budget, the Mark Twain National Forest has commenced projects under the existing plan that are compatible with revised plan objectives for ecosystem restoration. Projected management activities shown in Table E-3 are based on anticipated budget projections.

PC#43 H - We agree that restoration does not mean going back to a fixed point as stated in the FEIS page 3-16: “When the term pre-European settlement is used in the context of restoring natural communities, the primary reference is one of understanding what they were and how they functioned before the process of modern ecosystem degradation began.”

PC#43 I - Commenter expressed concern about the level of even-age management and prescribed burning. The projected acres treated to restore various natural community types are given on Appendix E of the 2005 Forest Plan. The total acre range for the seven natural community types is from 6% to 10% of the total Forest land base. Of these acres to be treated, the Mark Twain National Forest projects regeneration cuts in upwards of 34,500 acres for Alternative 3 during the first decade for purposes of treating a variety of natural community types in MP 1.1 and 1.2 across the Forest. These regeneration acres were initially figured using the rotation ages of the various forest types. Subsequently, the desired condition descriptions (see Table A-1, Appendix A of the Forest Plan); standards and guidelines under Vegetation Management pages 3-3 and 3-4 and 3-6 and 3-7 of the 2005 Forest Plan will provide guidance in how regeneration is used during project analysis. The total regeneration acres will be applied to move current altered vegetation patterns toward more desirable conditions, particularly for forested stands and woodlands. Regeneration cuts also help establish the full range of habitat structure for shrubs, oak regeneration, young forests and

establishment of grass/forb groundcover. Technically, no "true" even-aged management would be practiced in the forest plan revision, as it would all either be two-aged or uneven-age management. At least 7-10% of the regeneration harvest unit are retained in reserve trees and/or reserve tree groups (see page 2-28 of Forest Plan standards and guidelines). Reserve trees should include combinations of the largest, long-lived species (pine, white oak, post oak, etc), standing dead trees and cavity or den trees to achieve desired condition. Reserve trees may be selected to mimic age-class patterns, canopy openness and basal areas as specified for the respective natural community type. Even-age regeneration cuts may be as large as 40 acres, or even 500 acres within the Ava, Cassville, Houston, Rolla, and Willow Springs units to mimic spatial patterns of characteristic natural community types as determined during project analysis.

PC# 116 - The Mark Twain National Forest should provide clear criteria for restoration.
A) Including working with current ecological processes in the Ozarks.
B) Including activities that do not rely on intensive commercial timber harvesting.
C) To identify areas that would be available for some type of restoration, and clear and enforceable standards and guidelines for implementing such restoration.
D) Including restoration activities other than timber harvesting, chemical killing agents, and heavy machinery.
E) Including the impacts of timber harvesting on fragmentation.

PC# 116 A, B, C, D - The range of alternatives provide for a diversity of desired conditions and corresponding public use/resource protection in response to social, economic and ecological needs and issues. It should be noted that timber production nationwide has been reduced dramatically since the National Forest Management Act was written. This parallels the trend on the Mark Twain National Forest, which we feel reflects contemporary priorities and values. The planning process and corresponding new Forest Plan outlines desired conditions based on a framework of sustaining and restoring ecosystems. The use of silvicultural practices in conjunction with prescribed burning, control of exotic species and other methods are tools from which to best emulate historic disturbance processes. Further, how restoration work is planned and conducted on the ground is guided by an implementation document based on expert knowledge about ecosystem restoration.

PC# 116 A, B - An Ecosystem Restoration Implementation Guide for the Mark Twain National Forest is being drafted that incorporates ecosystem restoration criteria based on nearly 30 years experience by experts in state, federal and non-profit conservation organizations, and contemporary guidance/research. Ecosystem restoration follows county-wide assessments of current ecosystem dysfunctions and biodiversity integrity (see natural heritage inventories listed in Nelson 2005) and statewide ecoregional assessments listed in on page 3-61 of the FEIS. These assessments associate the loss of globally threatened natural communities and their associated species of conservation concern with the loss of historical natural processes. Restoration treatments on the Mark Twain National Forest are guided by describing the desired conditions for healthy natural communities. Standards and guidelines, and mitigation measures are applied to avoid or minimize negative effects. Many of the restoration planning criteria are components of both Forest implementation and statewide Comprehensive Wildlife Strategies. The intent of achieving the goals for Management Prescription 1.1 and 1.2 are primarily aimed at the priority of restoring ecosystems. All management tools (silvicultural, prescribed burning, use of herbicides, etc) are used to achieve specific desired conditions centered on healthy ecosystems.

PC# 116 D - Use of herbicides and pesticides particularly apply to treatments of problematic non-native invasive species and insect diseases (see response to PC# 101, Theme 7.14). We should employ control strategies that are aggressive, environmentally safe, and efficient on exotic species introduction and proliferation. While non-native invasives did not appear as a

major need for change issue, we recognize that they are a major threat to biodiversity, forest health and productivity and sustainability. Non-native invasives are listed as one of the four primary threats to Forest Service lands in the 2004-2008 USDA Forest Service Strategic Plan. We expect to be able to use a spectrum of tools to control invasive species, including mowing, competition, grazing, prescribed burning and herbicides. However, we are required to analyze the effects of these tools, which may result in the development of mitigation measures to prevent adverse impacts.

PC# 116 E - The intent of the Effects on Ecosystem Restoration on Fragmentation section of the FEIS was to discuss how fragmentation of non-native or altered landscapes incapable of natural regeneration, and unnatural succession (current condition) caused by loss of natural processes has moved the functionality and distributional/structural patterns of natural communities away from the Range of Natural Variability. For discussion regarding the effects of logging on fragmentation, see response to PC# 299K (Theme 8.8).

Theme 7.2 - Supports Ecosystem Management

PC# 183 - The Mark Twain National Forest should increase the use of ecosystem management on the Mark Twain National Forest.
A) To protect, manage and restore glade, savanna, woodland, prairie and fen natural communities.
B) Including a description of ecosystem management.
C) By rebuilding soils.
D) By letting nature heal itself.
E) By not removing cut vegetation.
F) By increasing the rotation period.

PC#183A - The Mark Twain National Forest appreciates the support of the Missouri Native Plant Society in increasing ecosystem management.

PC#183B - The habitat needs of many species are provided when there are a variety of age-classes and successional stages distributed across the landscape through time. The FEIS (page 3-95) shows that there are currently 37,000 acres of early successional habitat on the Mark Twain National Forest, which represents a 42% to 66% reduction over the last 15 years. This means that viability standards are not being met for the 1986 Plan. The 1982 Planning Rule (36CFR219.19) requires that the Forest provide widely distributed habitat so that native vertebrate species can interact with others in the planning area. Projected management activities will accommodate restoration of this underrepresented habitat and the early seral vegetation stages associated with underrepresented fire-adapted natural communities. However, this will occur within the limited boundaries of MP 1.1 and 1.2; thus, it is essential that the Forest provide early successional habitat in MP 2.1 and elsewhere. The Forest will count some of the early successional habitat created in restoration of savanna and open woodland along with early successional openings elsewhere.

PC#183C: The FEIS discusses the effects of all activities on soil resources in Table 48, page 3-263 of the FEIS. The summary states "Overall the cumulative effects on soil of activities on the Mark Twain National Forest, if standards and guidelines are implemented, should remain negligible." Also, the intent of moving toward desired conditions for various natural communities is to restore/recover soil characteristics associated with the greater variety of historical natural communities. Many soil series reflect their development under historic vegetation conditions and natural processes that are far removed from the historic range of disturbance variability.

PC#183C, D, E, F - The MTNF agrees with the commenter that global climate change is likely occurring. Among the abundance of studies on the interplay of climate and vegetation,

many seem to overwhelmingly point to complete deforestation, conversion of carbon-rich soils to agriculture and burning of carbon fuels as primary contributors to climate change. We believe the uncertainty about possible climate change effects on Midwestern vegetation is too great to propose broad-scale changes to vegetation or forest management practices. In fact, Missouri's vegetation has been far worse off following the exploitative practices of European settlement through the 1930's (see response to PC#318 (Theme 25.3)). The Timber Supply environmental effects section shows that average net growth far exceeding removal rates on the Mark Twain NF, and is not expected to change significantly in the foreseeable future. We believe the rates of climatic change are likely to be slow enough that our ability (if any) to exert significant influence will not be significantly compromised by the direction of management our Plans establish for the next 10-15 years.

PC# 186 - The Mark Twain National Forest should continue its focus on natural community restoration.
A) With the exception that once restoration is complete, the white oak, post oak, and pine trees should not be cut.
B) Including management of landscape areas identified in the Ozark Ecoregional Conservation Assessment under natural current restoration prescriptions.
C) Including protection for neo-tropical migrant bird species and regional bird conservation efforts.
D) Including priority given to fens.

PC# 186 A - The final revised Forest Plan will incorporate an added standard under the Wildlife Management section of MP. 1.1 and 1.2. It will say that activities will be distributed across the landscape so that the full range of variable conditions is present for each natural community, and that the predominant age of areas representing old growth character should be at least 25% above the rotation age. What this means is that a significant amount of older age classes will be balanced with other variable age groups of vegetation to mimic age-class structure for historical natural communities. The Forest will employ uneven-aged management techniques along with other methods appropriate to site specific evaluation of stand conditions, management objectives, natural community type and best suited to achieving the desired condition. Decisions on the type of management will be made at the project level.

PC# 186 B and D - As explained on page 3-61 of the FEIS, Management Prescriptions 1.1 and 1.2 were developed in response to information provided in the Ozarks Ecoregional Conservation Assessment. Objectives 1.1a and 1.1b identify treatment of fens during the plan period (see Table 1-1 on page 1-2 of the 2005 Forest Plan).

PC# 186 C - The Mark Twain National Forest actively participates in the Missouri Bird Conservation Initiative. Changes in goals, objectives, management prescriptions and standards and guidelines reflect the need for change to manage/restore natural communities important to a wide variety of species of conservation concern (including neotropical birds) and underrepresented natural communities (savannas and woodlands). Also see response to PC# 380 (Theme 7.9).

PC# 251 - The Mark Twain National Forest should manage natural resources with a long term approach.
A) Because short term goals reduce the functions of trees including habitat for animals and carbon dioxide scavenging.
B) To protect the integrity of life support systems for the benefit of all living things.
C) To protect lands as natural habitat.
D) To provide a balance between the environment and resource production.
E) With consistent budgets.
F) With dedicated staff.

G) With monitoring of applied activities.
H) With the ability to change management approaches when conditions and information warrant.

PC#251 A - One of the goals of timber management is to provide timber and wood products to help support sustainable local industry and economic interests. The analysis shows that much of the timber on the Mark Twain National Forest consists of small overstocked roundwood, which needs to be thinned. Thinning allows for species selection and the achievement of desired conditions for enhancing or restoring natural communities. With respect to carbon dioxide scavenging, see response to PC# 318 (Theme 25.3).

PC#251 B -We feel that the existing balance of management allocations given under Alternative 3 provides the best blend of goods, services and values for the public while allowing the National Forest to conserve important plant and animal species, and maintain healthy ecosystems. The ecosystem sustainability goals and objectives were developed in response to restoring and protecting biodiversity for the benefit of society.

PC#251 C - All of the alternatives, except Alternative 5, incorporate the ecosystem sustainability approach to management by allocating various amounts of Forest lands to manage and restore underrepresented natural communities. Current budget sources provide opportunities to treat lands and move toward desired conditions to improve forest health and ecosystem integrity.

PC#251 D - We feel that the existing balance of management allocations given under Alternative 3 provide the best blend of goods, services, and values for the public while allowing the National Forest to conserve important plant and animal species, and maintain healthy ecosystems.

PC#251 E, F, G, H - We concur with the comment that 2005 Forest Plan multiple goals and objectives are an ambitious undertaking for the agency. We believe we can make great strides toward meeting the goals and objectives based on the projected management activities. Also, realize that some of the objectives, particularly for ecosystem restoration, will require several decades to accomplish.

Theme 7.3 - Fire Regime

PC# 132 - The Mark Twain National Forest should consider timber harvest instead of burns.
A) Because of costs and economic advantages.
B) Because it can most often achieve desired results with far less impact to air, soil, and water.

PC#132 - Prescribed burning costs range from $13 to $81 per acre with costs per acre significantly reduced for treatment of larger burn areas. Costs are as low as $4 per acre on the Ouachita National Forest in Arkansas, primarily resulting from increasing burn unit size. Prescribed burning has many additional benefits on the Mark Twain including reducing the risk of damage caused by catastrophic fires, habitat improvement to wildlife and restoration of fire-adapted natural communities. Timber harvesting also continues to be an important activity on the Forest used to provide forest products, reduce fuel hazards and restore healthy natural communities. Carefully planned prescribed burns are also used for timber site preparation and can serve as an efficient alternative to labor intensive pre and post harvest treatments. For example, select thinning of 20-year-old regeneration stands can cost $60 per acre. Treatment types will be determined on a site-specific basis, considering environmental factors, cost, and the most effective methods to achieve the objective.

Theme 7.4 - Forest composition

PC# 193 - The Mark Twain National Forest should reconsider using pine trees for reforestation.
A) Because of negative impacts to wildlife habitat.
B) By reducing the amount of acreage being converted to pine.
C) In the Eleven Point District.

PC# 193 -A number of commenters want the MTNF to reconsider using pine trees for reforestation. Some have concerns about all the oak and hardwood trees being cut and replanted with pine, and possible detrimental effects to wildlife. Not having any pine on the MTNF is not realistic. The 2005 Forest Plan states in Goal 1 that it will "Maintain, enhance, or restore site-appropriate native natural communities, including the full range of vegetation composition and structural conditions." Further, Objective 1.1a reads that "Within Management Prescription 1.1 areas, apply management activities to move natural communities towards restoration in the distribution amounts shown in Table 1-1." An estimated 600,000 acres of shortleaf pine once occurred on the MTNF, part of a larger 6.6 million acres in southern Missouri. Today, only 500,000 acres is left in scattered stands across the state; a net loss of about 6.1 million acres. Much of the historical range of shortleaf pine, white oak, and post oak has shifted toward black oak, scarlet oak, and redcedar (see Figure 32 on page 3-69 of the FEIS). While the plan proposes to move toward a healthier balance of shortleaf pine and white oak in many areas, it does not propose to eliminate oaks, or to clearcut everything and replant only with shortleaf pine. The Mark Twain National Forest does not manage for pure pine plantations (as was done extensively in the 1930's through 1950's), rather it will re-seed or plant seedlings only on sites where shortleaf pine historically occurred, and in mixtures of oak or hickory hardwoods.

One commenter stated that the National Forest is going to convert 129,000 acres of oak hardwood forest to shortleaf pine forest. The Forest projects somewhere around 112,700 acres of regeneration harvest treatments per decade (see Table E-3). These regeneration harvests, along with other thinning treatments, will be widely distributed across the Mark Twain National Forest. This is less than 1% per year of the total forest acreage with regeneration cuts. Only a small part of this one percent would be clearcut acres—and clearcutting would only be used if it was determined to be the optimum method. At least 7% to 10% of the clearcut harvest unit would be retained in reserve trees and or/reserve tree groups, and any riparian areas or watershed protection zones in the stand would be protected.

Table E-4 estimates the range of acres of natural community types to be treated for restoration during decade 1. Open and closed woodland contain a total of 78,100 to 95,700 acres. Of this amount, approximately one half may contain sites where shortleaf pine once historically occurred. Appendix A-Terrestrial Natural Communities of the Revised Forest Plan provides descriptions of desired conditions for target natural communities that compliment Forestwide Goals and Objectives Tables 1-1 and 1-2 (page 1-2 of the Forest Plan). The desire is to treat approximately 30,000 acres in separate project areas on the Eleven Point Ranger District and 15,000 acres in the Poplar Bluff Ranger District during the plan period. It is the desire to restore viable portions of the Mark Twain National Forest to shortleaf pine-oak woodland based on the present-day rarity of this natural community type. Much work has started on both districts to move hardwood stands toward shortleaf pine. Based on interpretations of historic land survey records and local site evaluations, we envision that many project sites will contain mixtures of oak hardwoods and shortleaf pine, because historic land survey records indicate such mixtures occurred. Our estimates are that few sites contained pure shortleaf pine stands; these mostly occurring on upland ridges, plains and southwest-facing slopes. Initial analysis of the Pineknot Project on the Eleven Point

Ranger District estimates that historically 80% of the entire 10,000 plus acre site was dominated by shortleaf pine. However, local inclusions of pure or mixed oak occurred, especially in north and east-facing slopes and along headwater drainages. The expectation is that shortleaf pine may increase to approximately 60% dominance leaving sufficient oak mixtures. Also, comments were made that shortleaf pine woodlands contained little food sources for wildlife such as quail, wild turkey and white-tailed deer. However, on the contrary, when supplemented with thinning and frequent prescribed fire, these sites respond readily to fire and thinning with measurable increases in grass/forb cover and diversity. Examples of this recovery can be seen at Pineknot on the Eleven Point Ranger District and Cane Ridge on the Poplar Bluff Ranger District.

PC# 243 - The Mark Twain National Forest should sustain oak and pine forests.
A) By using even-aged management.
B) Without heavy-cut regeneration targets in Lower Rock Creek Area.
C) By designating old growth restoration zones.
D) By writing prescriptions that address black and scarlet overstock.

PC#243A - The Forest-wide Standards and Guidelines state on page 2-27 "Use silvicultural systems, harvest methods, and intermediate treatments to move the forest towards the desired condition. Base the decision on which type of systems, methods, and treatments to use on a particular site on management objectives, natural community type, stand conditions, and the silvicultural characteristics of the species present or desired." In some cases, even-aged management would be used. However, in some cases management objectives, stand conditions, etc. may indicate that the use of uneven-aged management would be most effective. As a result of the impacts described on page 3-58 of the FEIS, relatively short lived scarlet and black oaks now dominate where once longer-lived pine, white and post oaks were found. What was once savanna and open woodlands are now thick with undesirable brush and small diameter trees. These changes, along with the suppression of fire, have resulted in lower plant and animal diversity. A move towards a healthier balance of shortleaf pine and white oak will reduce the long term effects of oak decline that the Forest now suffers from due to an overabundance of black and scarlet oak.

PC#243B,C - The 2005 Forest Plan incorporates an added standard under the Wildlife Management section of MP 1.1 and 1.2. It says activities will be distributed across the landscape so that the full range of variable conditions is present for each natural community, and that the predominant age of areas representing old growth character should be at least 25% above the rotation age. A significant amount of older age classes will be balanced with other variable age groups of vegetation to mimic historical natural communities. The Forest will employ uneven-aged management techniques along with other methods appropriate to site-specific evaluation of stand conditions, management objectives, natural community type and best suited to achieving the desired condition. Decisions on the type of management will be made at the project level. Also, we wish to clarify that technically, clearcutting as practiced on the Mark Twain National Forest is clearcutting with reserves or two-aged management, in which varying numbers of reserve trees are not harvested to attain goals other than regeneration (see Forestwide standards and guides, Timber management, page 2-28 of the 2005 Forest Plan).

PC#243D - The 2005 Forest Plan has flexibility to allow managers to use the type of treatments necessary to move the forest towards the desired condition. Prescriptions written to leave all the best white oak and pine wouldn't be very effective in areas with insignificant amounts of those species, although prescriptions could be written to favor white oak and pine in appropriate areas. In 1897, the Organic Act established the national forests to, among other things, furnish a continuous supply of timber. The Draft Forest Plan Revision does

designate permanent old growth areas on the forest. However, timber harvests would be scheduled in areas suitable for timber production (See Table E-3 in Appendix E for Projected Management Activities). The proposed shift towards a healthier balance of shortleaf pine and white oak would be a gradual process. Goals and Objectives, and Standards and Guidelines found in the Draft Forest Plan Revision would help provide the range of natural habitats necessary to support populations of existing native plant and animal species, restore and manage natural communities, provide specialized habitats, support recovery of Federal and State listed species, and protect and manage habitat for other species of concern.

Theme 7.5 - Does not support Ecosystem Management

PC# 144 - The Mark Twain National Forest should consider changing the actions proposed in Management Area 1.1 in Alternative 3.
A) Because the proposed action will reduce hunting in the area.
B) Because of the potential effects that this proposed action will have on wildlife, cultural traditions and the local economy.
C) Because it could destroy or greatly reduce the number of turkey, squirrels, whitetail deer and other animals in the area.
D) Because the Agency should keep it's commitments to the previous plan and the people it made promises to.

PC# 144 A and C - We disagree with the comment that the proposed action will reduce hunting in the area. Management Prescription 1.1 is intended to provide a greater diversity of natural community structure commensurate with the variety of historical natural communities that were once present. The 2005 Forest Plan standards and guidelines for MP 1.1 and 1.2 will emphasize treatment of under-represented natural communities, and distribute activities across the landscape to emulate historical vegetation patterns. High integrity shortleaf pine and mixed pine-oak natural communities are underrepresented on the Mark Twain National Forest according to conservation assessments. See also response to PC# 366L (Theme 1.9). Restored high integrity natural communities (see discussion on "Defining High Quality Natural Communities" in Nelson 2005) attract abundant wildlife, and would not affect hunting opportunities.

PC# 144 B - See response to PC# 193 (Theme 7.4).

PC# 144 D - the Mark Twain National Forest has already moved toward management/restoration of this rare natural community by amending the 1986 Forest Plan by reallocating over 10,000 acres known as Pineknot at the Eleven Point Ranger District. As pointed out in the Ozarks Ecoregional Conservation Assessment, additional areas of viable shortleaf pine-dominated natural communities are needed to address concerns for the loss of globally distinct natural communities (see page 3-70 of the FEIS.) Also, standards and guidelines are in place under the Forestwide Vegetation Management, Timber Management and specific MP 1.1 and 1.2 from which to guide project planning that would assure mosaics of terrestrial types.) We disagree with the statement that this would simply undo the work. Rather, one of the important premises regarding today's management of our National Forest is adaptive management from which we should adjust and change direction in response to new information and need for change. Response to PC# 193 also explains how this shift would be gradual and continue allowing for a diverse forest.

PC# 212 - The Mark Twain National Forest should not use an ecosystem management approach to forest management.
A) Because historical information from one time period should not be used as a reference for present or future conditions.
B) Because it is bad science.
C) Because it will drastically reduce that amount of timber that can be harvested from the Mark Twain.
D) Because there are significant elements that have been added to current conditions.
E) Because regeneration cutting is the most efficient process for the Ozark Region.
F) Because using fire to mimic the historic burning practices of Native Americans will halt the recovery process of National Forests.
G) Because there are significant elements that are no longer in the ecosystem.
H) Because of the inability to control the complete ecosystem.

PC# 212 A - See response to PC# 43 A, B, C, D, H. (Theme 7.1)

PC# 212 B - As the conservation assessments and other documents (also see Appendix D-2) substantiate, the Mark Twain National Forest contains globally imperiled natural communities and habitats that without management would degrade (see Affected Environment page 3-64 of FEIS) and result in the continued loss of biodiversity. These assessments and many other documents (see citations listed in Nelson 2005) point to continued ecological degradation. Abrupt changes in those historical ranges of variability for disturbance processes, especially fire suppression, are resulting in a loss of native species, and because there are no longer mechanisms for recolonization by other conservative plant and animal species adapted to new prevailing environmental factors, the overall effect is one of continued decline and loss (Ladd 1991). We further strongly disagree that the literature cited in Nelson (2005), the 25 natural features inventories conducted by the Missouri Department of Conservation, the references cited on page 3-61 of the FEIS, and the efforts of the Missouri Department of Conservation's Comprehensive Wildlife Strategy and Missouri Natural Areas Program contributing to the analysis are "bad science".

PC# 212 C - We disagree that there will be a drastic reduction in timber production during the planning period. The difference in estimated Allowable Sale Quantity between Alternative 3 and Alternative 5 (current plan) is 20 million board feet or 2% of the difference. Actual current condition harvest on the Mark Twain National Forest is considerably lower than the ASQ amount given for Alternative 3.

PC# 212 D - The Ecosystem Sustainability approach to management takes into account the challenges, threats, and risks to the historic range of variability for natural communities and ecosystems. We disagree with the commenter that there is no proof from which to change direction. The context for defining and describing ecosystem health is based on The Terrestrial Natural Communities of Missouri (Nelson 2005), The Missouri Biodiversity Report (Nigh 1992), Ozarks Ecoregional Conservation Assessment (Ozark Ecoregional Conservation Team 2003) and the Missouri Natural Areas Program (see Appendix D-2, D-21). Achieving desired conditions for currently degraded natural communities is based on the first two key indicators listed on page 3-63 of the FEIS. As indicated in the discussion, 25 years of ecosystem restoration experience among federal, state and local/private conservation organizations, and research/monitoring demonstrate the successful reversal/healing of degraded natural communities.

The Multiple-Use Sustained Yield Act of 1960 requires that NFS lands be managed to provide a continuous flow of goods and services by providing a sustainable framework based on social, economic and ecological systems. We believe that the 2005 Forest Plan reflects upon a new paradigm shift toward a programmatic/permissive document that facilitates rapid response to changing conditions like hazardous fuels, forest health, new science, adaptive

management, and increased monitoring. Further, the range of alternatives provide for a diversity of desired conditions and corresponding public use/resource protection in response to social, economic and ecological needs. This includes designated wilderness, natural areas, special areas and a new management prescription emphasizing ecosystem restoration in addition to general forest management that emphasizes production of forest products.

PC# 212 E - See response to PC#208 and 209 (Theme 6.6). We concur that regeneration cutting can be an efficient process, even when restoring natural communities in Management Prescriptions 1.1 and 1.2. The proposed plan activities project some 34,500 acres of regeneration cut treatments in these prescriptions.

PC# 212 F - The goal of the Mark Twain National Forest is to Promote Ecosystem Health and Sustainability and to maintain, enhance, or restore site-appropriate native natural communities, including the full range of vegetation composition and structural conditions (see goals statement page 1-1 of 2005 Forest Plan). To accomplish this goal, the MTNF must restore prescribed fire since most present day degraded natural communities and many species of conservation concern are associated with fire-adapted natural systems. The ecosystem sustainability goal statement is consistent with the goals outlined in the Missouri Biodiversity Report jointly published by the Missouri Department of Conservation and Mark Twain National Forest (Nigh 1992).

PC# 252 - The Mark Twain National Forest should not rely on arbitrary timelines for restoration.
A) Such as a pre-European settlement conditions.
B) Because of the impacts on timber production.

PC# 252 - See response to PC#112 B (Theme 3.1)

Theme 7.6 - Use Native Species

PC# 178 - The Mark Twain National Forest should use native species for restoration work.
A) Rather than naturalized species and listed in Management Prescription 5.1.
B) Including landscaping projects.
C) Including Mark Twain National Forest superior trees.

PC# 178A, B- See response to PC# 312 (Theme 7.11.)

PC# 178 C - This "genetically improved" seed was developed from native trees on the Mark Twain National Forest. Candidate native trees were located and evaluated for superior qualities, such as straightness and form, insect and disease resistance, and other quality characteristics. The top candidates were chosen to be part of a tree improvement breeding program to provide quality seed for reforestation of national forest land.

Theme 7.7 - Use of pre-European settlement conditions

PC# 346 - The Mark Twain National Forest should state why they intend to manage the forest toward a pre-European settlement condition.
A) Including an explanation of why ecosystem health was believed to be better prior to European man's arrival.
B) Including quantified societal costs and benefits of restoring the ecosystems to obtain public support.

PC# 346 A - The commenter suggests stating in bold why the Forest intends to manage toward the desired future condition as described in Part III: References to Range of Natural Variability: Page D-7 of the FEIS. The MTNF will clarify this portion of the FEIS to address the suggestion. See also response to PC#387 (Theme 7.7).

PC# 346B: The Biodiversity of Missouri (Nigh et al. 1992), Endangered Species Act of 1973, National Forest Management Act, Multiple-Use, Sustained Yield Act and many other laws are enacted in response to Society's desires to protect plant and animal species, and ecosystems for many benefits and values. The Biodiversity of Missouri report, Missouri Department of Conservation website, Missouri Species and Communities of Conservation Concern (I.D. #: NAT 329, 2005), NatureServe website and Precious Heritage of the United States (Wilcove et al. 2000) all discuss threatened species and ecosystems in the context of destroyed or altered historical ecosystems. It is the specific Missouri vegetation condition (desired conditions for terrestrial natural communities, Nelson 2005) that harbor many species of interest and conservation concern.

PC# 396 - The Mark Twain National Forest should explain how Native American's influence created a great diversity in both plant and animal communities, and that this great diversity is a benchmark of ecosystem health.
A) Including a list of reasons why the preferred alternative is the best process to restore ecosystem health.

PC# 396 - Please see the reference to fire in FEIS, Appendix D-13 and D-22. The presence of fire as one factor among other disturbance processes that is a significant disturbance agent for creating this benchmark, not just exclusively Native Americans. Fire did result from other sources.

PC# 387 - The Mark Twain National Forest should consider that fire alone cannot restore communities and that fire is not the only element affecting historical natural communities.

PC# 387 - As explained in the FEIS, the affected environment was altered by abrupt changes in the historical ranges of variability for disturbance processes, especially fire suppression. Ecological and ecoregional conservation assessments (listed on page 3-61 of the FEIS) explain how fire suppression is resulting in loss of biodiversity. There are no longer mechanisms for recolonization by other conservative plant and animal species adapted to new prevailing environmental factors; thus, the overall effect is one of continued decline and loss (Ladd 1991, Nigh et al.1992). Many plant species found now in degraded open land natural communities are faithful to a narrow range of ecological conditions, and sensitive to degradation associated with post-European settlement. In another words, little evidence exists from which to demonstrate that many ecologically confined native plant species could have the capacity to rapidly migrate, recolonize and accrue the species richness found in remnant natural areas today. These natural communities, and their associated plants and animals, are globally distinct and only occur elsewhere across the planning area in small relict patches. Finally, most importantly, federal and state conservation agencies and non-profit conservation organizations have applied prescribed fire to all of these natural communities for the past 25 years. Monitoring fire effects demonstrates the success of maintaining habitat diversity for the recovery of viable populations of otherwise hundreds of species of conservation concern and a narrow range of many other restricted plant and animal species.

Theme 7.8 - Effects on timber supply

PC# 347 - The Mark Twain National Forest should provide a timeline to show how management will occur in the next ten to twenty years and how it relates to the availability of forest products.
A) Including the red oak species group.
B) To alleviate the fear that ecosystem restoration will reduce the availability of growing stock in the red oak species group.
C) And extend the discussion beyond the Allowable Sale Quantity determination.

PC# 347: It is the intent of the MTNF to move the Forest away from the red oak group and more toward dominance by white oak, post oak and shortleaf pine. Continuing to maintain large acreages of the red oak group will greatly increase the risk of future oak decline. The MTNF needs to strengthen its supply of timber products by moving toward a greater balance in the diversity and composition of its timber products. The FEIS discloses the dominance and departure of the red oak group from what tree species once dominated the Forest. Regardless of the intent to shift away from red oak dominance, the process is expected to be sufficiently slow enough to offset any major impacts to those industries and local mills that depend on red oak. Even with various silvicultural treatments, the regeneration of the red oak group is apparent. Conversions to other species are expected to occur slowly. The FEIS chapter on social and economic effects discloses the direct and indirect effects for each alternative. It explains that most local mills have adapted to the intermittent supply from federal lands by increased purchases from other sources. The analysis projects that only Alternative 1 could have the greatest effect on the timber industry.

Chapter 4 of the 2005 Forest Plan requires that the MTNF monitor and evaluate as a feedback mechanism for adaptive forest management. Certain types of data are mandatory components of every forest plan, including consideration of the effects on land, resources and communities. These monitoring requirements shall provide for quantitative estimates of performance comparing outputs and services.

Theme 7.9 - Biodiversity

PC# 380 - The Mark Twain National Forest should recognize the decline in biodiversity.
A) Including provision and protection of a wide array of habitat for native aquatic and terrestrial species.
B) Including protection for migrating songbirds.
C) In order for future generations to enjoy the diversity of the forest.
D) By spending its federal money to enhance biodiversity, not policing illegal off-road vehicle use.
E) Because biodiversity is the best indicator of long-term forest health.
F) By making the overall management philosophy of the Mark Twain National Forest, to maintain and increase native biodiversity through forest practices that restore glades, savannas, woodlands, and forests to provide habitat for native plants and animals.

PC# 380 A and F: The MTNF created Management Prescriptions 1.1 and 1.2 in response to the Ozarks Ecoregional Conservation Assessment as a strategy for conserving biodiversity.

PC# 380 B: Goal 1.4 in the 2005 Forest Plan (Page 1-3) clearly states the intent of the MTNF to provide and protect the full array of habitat conditions necessary to support all native Missouri wildlife, which is also identified as a need for change (Revision Topic 2c). Goal 1.1 clearly states our intent to maintain, enhance, or restore natural communities such as glades, savannas, woodlands, and forests (2005 Forest Plan page 1-1). The Ecosystem Sustainability goals and objectives provide for distribution of projected management activities in response to the need to restore and maintain underrepresented natural

communities. Ecological assessments (see page 3-61 of the FEIS) indicate that there is a need to restore and provide more glade, savanna, and open woodland habitat for a number of declining songbirds, as well as other plant and animal species of conservation concern associated with these habitats. This approach also will provide for the adequate distribution of forest natural communities for forest interior bird species. During analysis of potential impacts to wildlife, the MTNF completed an exhaustive Species Viability Evaluation, summarized on pages 3-62 and 3-129 through 3-160 of the FEIS. As part of this process, information on neotropical migratory birds was reviewed and evaluated. In the Missouri Ozarks, the groups of species that shows the most decline are those that need shrub or grassland habitat. Forest interior birds are doing relatively well, and in fact, are thought to be source populations that provide extra birds to sink populations in other parts of the Midwest (Fitzgerald and Pashley 2000). However, in recognition of the need for large blocks of forest cover (including all successional stages), the worm-eating warbler was selected as a Management Indicator Species for the MTNF (FEIS page 3-116).

PC# 380 C and F - Forest Service Strategic Plan (2004-2008 Revision) states: "The mission of the USDA Forest Service is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations."

PC# 380 D - The illegal use of ATV's on the MTNF is an ever-increasing enforcement problem for the MTNF given current resources. It is imperative that we continue with enforcement as a means of preventing damage to areas that provide special habitats for plant and animal biodiversity, especially streams, fens, and glades.

PC# 380 E - We disagree with the commenters statement that the 2005 Forest Plan does not address the needs of our nation in the context of protecting biodiversity. We believe that the 2005 Forest Plan represents a major paradigm shift from one of employing a timber management regime as the means of providing wildlife habitat to one driven by accomplishment of desired conditions for specified natural communities. The conservation approach and strategy was developed in cooperation with The Nature Conservancy, the nation's leading conservation organization charged with conserving biodiversity.

Theme 7.10 - Pesticides

PC# 185 - The Mark Twain National Forest should not use chemical herbicides and pesticides.
A) Because they are contributing to dead zones around the world.
B) Including use in cemeteries.
C) Because the impacts are not adequately disclosed in the Draft EIS.

PC# 327 - The Mark Twain National Forest should review standards and guidelines regarding Pesticide Use.
A) Including guidelines for use in permits as standards.
B) Including not allowing or better control of aerial application.
C) Including encouragement of non-chemical means.
D) Including hand application.
E) Including using scientifically accepted studies before using pesticides to ensure the latest precautions and risks are accounted for.

PC#185 and 327- See Forestwide Standards and Guidelines on Cemetery Management under Special Uses Management on 2-32, Pesticide Use on 2-19 and 2-20 of the 2005 Forest Plan, and the Species at Risk (SAR) section of the FEIS starting on 3-129. A Review was conducted of the Standards and Guidelines for Pesticide Use in the 2005 Forest Plan, and direction contained and in Forest Service Manual 2150 and Forest Service Handbooks 2109.14, (Pesticide Use Management and Coordination Handbook), and the Health and

Safety Code Handbook. This review confirmed that this direction will ensure that pesticide use on the Mark Twain would be safe and effective. This direction includes environmental analysis, risk assessments, and safety precautions.

Theme 7.11 - Non-native Invasive Species

PC# 187 - The Mark Twain National Forest should use natural processes for ecosystem restoration.
A) To remove exotics in favor of native species.
B) By decreasing acreage designated Management Prescriptions 1.1 (Roaded Ecological Restoration) and 2.1 (Multiple Use) and increasing acreage designated 1.2 (Roaded, Semi-Primitive Ecological Restoration), 5.1 (Wilderness), and 6.1 (Semi-Primitive, Non-Motorized).
C) While accounting for the full range of dynamic natural process rather than the restoration of landscapes.
D) Including reducing even-aged management.

PC#187 - We appreciate the support of the commenter in agreeing with methods of ecosystem restoration that favor native species over exotics.

PC# 187 - B and C: Ecosystem restoration requires active management. Without it, many high integrity natural communities will not exist (see McCarty in Nelson 2005). Dynamic disturbance processes must include the range of historical conditions under which natural communities adapted, particularly those that occurred prior to the influences of modern settlement. The impacts of post-European settlement are disclosed in the Affected Environment section of the FEIS (pages 3-64 through 3-73). The effects of various management options are disclosed on pages 3-73 through 3-74 of the FEIS. We feel that the existing balance of management allocations given under Alternative 3 provide the best blend of goods, services and values for the public while allowing the National Forest to conserve important plant and animal species, and maintain healthy ecosystems.

PC# 187 D - See also response to under PC# 43 I (Theme 7.1).

PC# 265 - The Mark Twain National Forest should not specify a set number of acres to control for noxious or non-native invasive species in Objective 1.2a.
A) Because there may be a need to control more.
B) But instead conduct a comprehensive assessment of invasive species presence, impacts, potential risks, and treatment strategies and timelines for the Mark Twain lands.

PC# 265 A: We will amend the objective to read "Control a minimum of 2,000 acres….

PC# 265 B: The goal of treating at least 2,000 acres of existing non-native invasives was derived by asking respective district ranger staff how much effort went into treating invasive species over the course of the 1986 plan. The 2,000 acre goal exceeds the estimated 1,000 acres treated during the first plan period. The Mark Twain National Forest conducted a Forestwide inventory of non-native invasive species during the 2003-2004 season to establish a preliminary baseline assessment. We recognize the need to continue such inventory work, depending on available budget.

PC# 312 - The Mark Twain National Forest should change standards and guidelines regarding non-native invasive species.
A) Including prohibition of non-native species for landscaping projects.
B) Including only planting native species.
C) Including alternative methods for eliminating non-native invasive species such as cattle and horses.
D) Including sugar water for treating non-native invasive species.

E) To address how timber harvest can stimulate non-native invasive species.
F) By adding a standard to eradicate the feral and non-native species that pose a threat to the integrity of other species in the forest.

PC# 312A, B - We respectfully disagree with the suggestion that we change standards and guidelines regarding non-native invasive species, including prohibition of non-native species for landscaping projects, and only planting native species. Using certain non-native plant species can function at lower maintenance/operational costs, are often sterile and not problem exotics. Past experience by another agency to implement such a policy demonstrated it required much labor, care and cost. Many of the non-native plant species used in the past for landscaping purposes are now widely distributed across the Forest in recreation areas. The selections pose little existing problems when compared to other non-native exotics that are inventoried forestwide. Additionally, the standards and guidelines encourage use of native species.

PC# 312C, D - See response to PC# 75 (Theme 15.1) regarding eliminating non-native invasive species such as cattle and horses. With respect to using sugar water, the new Forest Plan is permissive; thus, would allow for the use/evaluation of "sugar water" along with any other means to meet non-native invasive species or other management goals during project analysis.

PC# 312E - The commenter suggested that the analysis completely ignores the impacts of logging on NNIS. This is a programmatic, not site-specific document, and a different level of detail is appropriate. The narrative in the FEIS provides a sufficient level of detail for the deciding officer to make a rational decision. The FEIS addresses potential effects at a programmatic level and addresses effects in enough detail for the deciding official to be able to make a rational choice between alternatives. Alternative comparisons are found throughout Chapter 3 of the FEIS, and in particular, are summarized on pages 2-19 through 2-40. This request is outside the scope of the Plan decisions, or is more appropriately addressed at the site-specific project level. The ID team supports the analysis as completed and has determined that the additional information requested is not necessary for the deciding officer to make a reasoned choice between alternatives. Also, all timber harvest contracts include a requirement to clean equipment prior to logging operations to reduce or minimize the accidental introduction/spread of problem non-native invasive species.

PC# 312 F - The MTNF believes the standard for "prioritizing areas of NNIS for treatment based on threats, etc." adequately addresses the concern for eradicating feral and non-native species.

PC# 342 - The Mark Twain National Forest should take an aggressive stand on exotic species introduction and proliferation in the forest.
A) Including regular extensive monitoring.
B) Including manual removal whenever possible.
C) Including discouraged use of herbicides.
D) Including sugar water spraying as an alternative to herbicides.

PC#: 342 - We agree with the comment regarding taking an aggressive stand on exotic species introduction and proliferation. While non-native invasives did not appear as a major need for change issue, we recognize that they are a major threat to biodiversity, forest health and productivity and sustainability. Non-native invasives are listed as one of the four primary threats to Forest Service lands in the 2004-2008 USDA Forest Service Strategic Plan. We further agree that monitoring is the critical element from which to assess the seriousness of non-native invasives, identify needs, consider adaptive management and then develop control strategies. Regarding manual control, the US Forest Service must take into account budget and personnel constraints, efficiency and effectiveness in choosing among the various

treatments. The Forest Plan is permissive in that it provides flexibility for the treatment of non-native invasives and allows for disclosure of effects during project planning. The commenter discourages use of pesticides. Standards and guidelines for pesticide use (See pages 2-19 and 2-20 of 2005 Forest Plan) are adequate to address this comment. With respect to sugar water spraying, see response to PC# 312 (Theme 7.11).

Theme 7.12 - Allow use of clover

PC# 13 - The Mark Twain National Forest should consider allowing the use of clovers in revegetation efforts.
A) Because clovers can be a positive addition to limited early successional habitats in a forest dominated landscape.
B) Because clovers provide high protein forage that is utilized by a wide array of wildlife and harbors high insect densities that are utilized by a variety of wildlife.
C) Because clovers have never been considered to be an invasive species.

PC#: 13 - The intent of vegetation guidelines under the Non Native Invasive Species standards and guidelines (Forest Plan 2-2) is to encourage use/revegetation of local native species for temporarily disturbed sites that are expected to return to native vegetation, including utility corridor right-of-ways, mechanical firelines, timber loading/staging areas, rehabilitation, etc. We will amend the standard under non-native invasive species management to include use of non-native species for other purposes including artificial openings and improved cool season pasture.

Theme 7.13 - Remove invasive species

PC# 57 - The Mark Twain National Forest should remove invasive species from the Mark Twain National Forest.
A) Including Kudzu.

PC#: 57 - Goal 1.2-Non-Native Invasive Species is to "Prevent new invasions and control or reduce existing occurrences of non-native invasive species." A proposed standard under Non-Native Invasive Species Management on page 2-2 of the 2005 Forest Plan includes criteria for prioritizing areas for treatment. This includes examining the relationship of non-native invasive plants (like Kudzu) to boundaries. Nothing in the 2005 Forest Plan would restrict or limit decision makers in treating non-native invasive species that might threaten private property.

Theme 7.14 - Oppose legislation

PC# 101 - The Mark Twain National Forest should oppose invasive species legislation and regulation.
A) Because it has no solid, scientific definition.
B) Because existing laws are sufficient.

PC#: 101 - We respectfully disagree with the commenter. Invasive species is not simply a buzzword, or an excuse for other actions. Invasive species are real plants and animals that threaten the existence or health of both native plants and animals and, in many cases, crops and domestic animals. The 2005 Forest Plan direction for management of non-native invasive species is found on page 2. All existing laws and regulations would be followed. Creating or opposing federal policy regarding non-native invasive species is outside the scope of Forest Plan decisions.

General Theme 8 - Wildlife

Theme 8.1 - Management Indicator Species (MIS)

PC# 142 - The Mark Twain National Forest should include more species on the list of Management Indicator Species.
A) Including avian species such as whippoorwill, quail, and turkey.
B) To get a more comprehensive approach to managing forests for ecological health.
C) To assess management practices on species that are most reliant on old growth and other habitats uniquely provided by the Mark Twain National Forest.
D) Including amphibians such as frogs and salamanders.
E) Because the few species selected leave fish, amphibians, reptiles, and terrestrial mammals unrepresented.
F) Including more forest-interior species such as the cerulean warbler and species listed in association with the worm-eating warbler.
G) Including indicators for water quality such as the Topeka shiner, Blacknose shiner, the Rainbow darter, and the Ozark hellbender.
H) Including indicators for water and caves such as the cave salamander and grotto salamander.
I) Including large predators such the black bear.
J) Including the Indiana Bat.
K) Including Management Indicator Species habitat as a key indicator.
L) And require counting to determine population levels.
M) Including representative species dwelling in all the major community types evident in the forest.

PC#142 – CFR 219.19(a)(1) requires that "certain vertebrate and/or invertebrate species present in the area shall be identified and selected as management indicator species and the reasons for their selection will be stated." MIS are selected because their population changes are believed to indicate the effects of management activities. (36 CFR 219.19 (a)(1). Five categories of species are identified in CFR 219.19(a)(1) that shall be considered and selected where appropriate. These categories range from the most imperiled species (i.e. federally endangered or threatened) to species so abundant that they are "commonly hunted, fished, or trapped"; thus the NFMA regulations allow considerable discretion in the selection of MIS.

The 1986 Forest Plan has 13 MIS. Many of these species are generalist species that are not effective at indicating effects of Forest Service management activities, particularly on species restricted to or highly dependent on special habitats. The MTNF MIS list has been revised to better reflect viability concerns and an emphasis on sustaining healthy and diverse natural communities. By selecting a limited but appropriate set of management indicators, MTNF can focus inventory and monitoring efforts where needed. The change to MIS is a means of better reflecting changes in habitat composition and quality, and indicate effects of management on national forest lands. Four of the five species selected as MIS for MTNF are avian species

No indicators were selected for caves, riparian or aquatic communities or for old growth or early successional forest. Monitoring of conditions for these habitat components will be done by methods other than MIS. Thus, the species that are reliant on these habitats could be assessed through habitat.

The revised list of indicators selected represent a wide range of species, including but not limited to: northern long-eared bat, Indiana bat, whip-poor-will, wood thrush, Kentucky warbler, ovenbird, yellow-billed cuckoo, four-toed salamander, gray squirrel, southern flying squirrel, evening bat, Luna moth, brown-headed nuthatch, prairie warbler, pine warbler, field sparrow, yellow-breasted chat, dickcissel, Ozark woodland swallowtail, painted bunting,

collared lizard, roadrunner, western pigmy rattlesnake, Missouri tarantula, fox squirrel, black bear, wild turkey, deer, eastern wood peewee, great crested flycatcher, osage copperhead, timber rattlesnake, three-toed box turtle, Missouri woodland swallowtail, swamp metalmark, ringed salamander, four-toed salamander, Hine's emerald dragonfly, Ozark snaketail dragonfly, and Ozark emerald dragonfly.

PC# 281 - The Mark Twain National Forest should conduct additional analysis for Alternative 1.
A) By clarifying how natural levels of old growth can be restored.
B) By providing explanation of how the Forest can thin itself out.
C) Including Oak Decline.

PC#281 – Page 3-57 of the FEIS estimates 400,000 acres of MTNF are at moderate to severe risk of oak decline. We have no real indication how much of this will result in mortality. However, as areas succumb to oak decline or other natural disturbances resulting in regeneration and creation of 0-9 age class these areas may counted toward regeneration habitat. Under normal circumstances we estimate 1-2% of natural regeneration per year. Additional discussion of impacts of oak decline and salvage on wildlife has been included in the FEIS.

Historic old growth conditions were highly variable resulting from the effects of moderate to high frequency, but low intensity fires. Old-growth in fire-dependent forest types may not differ from younger forests in the number of canopy layers or accumulation of down woody material. Artifact old growth (which could occur within our wilderness areas and other sites with no management) occurs across much of the forest in stands that currently meet the age class definition of old growth and which differ in composition and structure from the historic range of natural variability. Native grazers and Native Americans (both currently not a driving force on the landscape), provided disturbance to the forest, which we try to emulate through prescribed fires and other management tools. With limited timber and burning activities occurring in Alternative 1, these historic conditions would not be similar to the range of natural viability. The FEIS discusses the historical setting on pages 3-7 through 3-8, historical disturbance regimes on pages 3-17 through 3-18, and describes how the environment has been shaped by past events on pages 3-59 through 3-89. The impacts of no management and Alternative 1 are discussed in the FEIS on pages 3-74 through 3-76, and 3-80 through 3-82.

PC# 522 - The Mark Twain National Forest should evaluate the sub-watershed species predictor work compiled by Missouri Resource Assessment Partnership.
A) Because a homogenous Management Indicator Species list across all Mark Twain National Forest Districts may limit flexibility, or may establish unattainable objectives.

PC#522 - Pages 3-115 through 3-116 document the procedure and criteria that were used in the selection of the revised MIS list. We feel our process was sound and followed the intent of the law. The selection of the MIS focused on species and natural communities considered most likely to provide an indication of the Forestwide effects of management in response to the need for change issues. See also response to PC#142 (Theme 8.1)

Theme 8.2 - Fishless ponds

PC# 58 - The Mark Twain National Forest should provide small, fishless pools for amphibian breeding populations.
A) To ensure that native amphibians remain a part of national forests.

PC#58 - Page 2-14 of the 2005 Forest Plan allows for the construction of waterholes only where limited or lacking. Maintenance of existing ponds on the forest is priority over new construction. The current number of ponds on FS lands is approximately 1.3 per square mile,

which is above the 1986 Forest Plan standards and guidelines. These ponds will be maintained to provide habitat for amphibians. Maintenance of existing ponds within MP 1.1 and 1.2 is permitted. In addition, page 2-38 provides for the construction of temporary pools at the end of outlet ditches whenever possible. This will provide an opportunity to provide temporary fishless pond habitat on ridgetops, where they may be lacking. Also, drainage features have an option to provide for retention of runoff water in small pools. The coarse-filter/fine filter approach to ecosystem sustainability allows for addressing individual species needs in the event that ecosystem management does not provide for the needs of such species of concern. We recognize that some wetland habitat and historic disturbance processes have changed and are not as suitable for a host of aquatic plant and animal species. The Historic Range of Variability for widespread diverse habitats, the ecological health of natural communities, species migration patterns and other factors no longer sustains the former abundance and distribution of all wildlife area wide; thus, the best chance for many species of conservation concern to survive may only exist on protected public lands. Therefore, the 'No new wildlife ponds shall be constructed' standard in MPs 1.1 and 1.2 has been changed to read 'New wildlife waterholes shall only be constructed if site-specific analysis demonstrates a long-term, landscape-level viability concern for TES, RFSS, or species groups (such as hertofauna), and such concerns cannot be addressed through waterhole construction in other areas of the Forest (i.e. 2.1 Management Prescription)."

Theme 8.3 - Aquatic Habitat

PC# 81 - The Mark Twain National Forest should reconsider standards regarding trout occurrence.
A) Including trout in Greer Spring Branch.
B) By maintaining its position regarding not introducing them to streams where they did not exist in August 2002.
C) Including a standard to protect nearby privately owned trout streams and populations.
D) Including adding "Aquatic Cave Habitat" to protect Typhlichthys, Typhlotriton and possible Amblyopsis.

PC#81 A - The Forest Service respectfully disagrees with the commenter's position regarding Greer Spring Branch.

PC#81 B - Comment noted.

PC#81 C - Standards and guidelines developed to prevent or minimize soil movement and to protect riparian or streamside areas (2005 Forest Plan pages 2-2 through 2-5) would also serve to prevent or minimize impacts to adjacent private ownerships. Standards and guidelines proposed for the protection of the RMZs and WPZs will minimize any impacts to the watersheds as a whole. The Mark Twain National Forest does not have any authority to conduct or influence activities on private lands. Project level impacts would be address in the cumulative effects sections of environmental impact statements and assessments.

PC#81D - While not specifically mentioned in the Aquatic Habitat section, cave streams, springs and other subsurface waters that may harbor Typhlichthys, Typhlotriton, and possibly Amblyopsis are protected through a variety of standards and guidelines. Pages 2-13 through 2-15 of the 2005 Forest Plan show standards and guidelines associated with management of caves, springs, sinkholes and other karst features. Standards and guidelines associated with water and soil management are found on pages 2-2 through 2-5 of the 2005 Forest Plan.

PC# 297 - The Mark Twain National Forest should review standards and guidelines for fishing impoundments.
A) Including making joint Missouri Department of Conservation and Mark Twain National Forest Fisheries Management Plans available in an appendix.
B) Including control of aquatic species as a standard.
C) Including adding the following "fish populations may be impacted when watershield grows to a nuisance level. Cover for young fish and aquatic invertebrates is reduced when other plants are crowded out by watershield."

PC#297 - The Need for Change (NFC) did not propose any additional changes in direction for fish and aquatic management. The Forest Plan was recently amended to incorporate goals and management direction for fish and aquatic species into the Forest Plan. The amendment provides for protection of aquatic ecosystems, restoration of degraded aquatic ecosystems and recovery of threatened and endangered aquatic species, and enhancement of aquatic resource user opportunities by increasing system productivity, improving user access and/or associated amenities, and providing environmental education and interpretation. The only changes were those needed to explain or clarify direction in the existing plan, removing items that do not pertain to the six Forest Plan decisions, or removing direction that can be found elsewhere, such as in the Forest Service Directives System. These changes do not represent a change in the direction, goals or objectives in the Plan. See also response to PC# 306 below.

PC#297 A,B - Management of specific Mark Twain National Forest lakes for fisheries has been an on-going cooperative effort between the Missouri Department of Conservation and US Forest Service for many years. The intent of this standard is to recognize that partnership and make clear our intent to continue it into the future. However, proposals for management activity on National Forest lakes, whether by MDC or USFS, would be evaluated site-specifically and documented in the appropriate manner. Any management direction recommended in the Fisheries Management Plans would require site-specific analysis to address any project level effects.

PC#297 C – The references to the impacts of watershield to fish populations has been removed. It is recognized that watershield can indirectly affect fish populations by affecting breeding grounds and smaller insects and fish that are food sources.

PC# 306 - The Mark Twain National Forest should change standards and guidelines regarding Streams and Rivers.
A) Including making heavy equipment guidelines into standards.
B) Including making the removal of large woody material a standard rather than a guideline.
C) Including the groundwater connection between the Eleven Point River Basin and the Current River Basin.
D) Including prohibition of timber harvest in the viewshed of a float stream.
E) Including requiring surveys to determine the presence or absence of rare mussel species before any work is done in streams.
F) Including removing the requirement that hydraulic control structures be designed to mimic the appearance of natural habitat features.
G) Including removing the requirement that Aquatic Habitat enhancements be designed to mimic natural habitat features.

PC#306 – A "guideline" is a course of action that should be followed in most circumstances. They provide important resource protection. However, guidelines relate to activities where site-specific factors may require some flexibility. Deviations from a guideline must be analyzed and documented in a project level analysis but do not require a Forest Plan amendment while deviations from a "standard" require a Forest Plan Amendment. The statements referred to on page 2-10 of the 2005 Forest Plan are guidelines.

They state that we need to look into all options, and limit the visual impact of the aquatic habitat improvement to an area, while still providing the support that is needed. Large woody material is vital in the riparian areas to provide a source of wood in the streams. In many locations across Missouri, the historic volumes of large woody material (LWM) in the streams are not present. Wood in many Ozark streams is essential to habitat formation, channel stability, etc. As a guideline, removal of woody material from streams could occur if there is a public risk. Again, site-specific analysis would need to be completed.

PC# 306 A and B – See response to PC#306 above.

PC# 306 C – The EIS does not mention the groundwater connection between the Eleven Point River basin and the Current River basin, because the document is a forest wide programmatic document. It is not practical to discuss the interactions between all 70 5th digit HUCs that are found within the Forest. During a project level analysis the impacts of management associated with those watersheds would be analyzed. Implications of management outside the Forest are discussed in the cumulative effects section of each resource area.

PC# 306 D –In Management Prescription 6.3, page 3-42, a standard exists to protect the viewshed from the river. Management prescription 6.3 is designed to provide management of eligible rivers to maintain or enhances their outstandingly remarkable values, free-flowing character, and potential for recommended classification (page 3-41 of the Forest Plan.)

PC#306 E - Standards and guidelines have been added to the Forest Plan to protect mussel species. (See page 2-8 of the Forest Plan.)

PC# 306 F and G - The intent of the guideline referred to is to limit the visual impact of hydrologic control structures while still providing the support that is needed. The same guidance is used on page 2-10 of the 2005 Forest Plan when referring to habitat improvement structures.

PC# 374 - The Mark Twain National Forest should remove the "Aquatic" section contents of the Forest Plan until they consult with the Missouri Department of Conservation. A) Because the inclusion of a table and aquatic standards appears to represent a change that could significantly affect future trout management on Forest Service properties.

PC#374 A - Amendment #27 of the 1986 Forest Plan, dated August 2002, included a standard and guideline to "Intensively manage for naturalized trout species, including put-grow-take, in streams where they now exist." Table 2-2 on page 2-11 of the 2005 Forest Plan specifies those streams that meet the criteria outlined in Amendment #27, i.e. those that were actively being managed for trout as of August 2002. The 2002 Amendment also includes a standard and guideline to "Manage for native species in those streams where trout do not exist, trout (native or naturalized) will not be introduced into these streams." The standards in the 2005 Forest Plan, including Table 2-2, are not changes in management direction from the 1986 Forest Plan. However, to eliminate any misunderstanding of the intent of Table 2-2, it has been changed in the 2005 Forest Plan to remove the "Management" column. We understand that MDC has made changes in management of trout in these stream sections, and that additional changes may be made to these segments in the future.

Theme 8.4 - Downed wood

PC# 125 - The Mark Twain National Forest should encourage removal of downed wood.

PC# 125 - The Mark Twain National Forest has an active firewood permit program. Both commercial and personal use permits are available for purchase from the local ranger district

offices. While the removal of some downed woody material is appropriate, much should be left in place. The approval of firewood permits and commercial firewood sales are considered valuable management tools that are often used when consistent with meeting project areas management objectives. Permits are also issued to clean up downed wood following timber sales and felling contracts. Those interested in procuring firewood can inquire at respective Ranger Districts to the availability of sites to collect firewood.

However, the Mark Twain National Forest recognizes the need to provide for down woody material habitat component across the landscape (Goal 1.4), both terrestrial and aquatic. A number of species within the MTNF are dependent on down woody material. Direction for regeneration areas provides a guideline (pg 2-9) to leave downed woody material on-site whenever possible. Downed woody material provides shelter, humid retreats and foraging areas for numerous amphibians and reptiles in forests, woodlands and savannas, as well as riparian areas (PARC 2002). Most amphibians, including salamanders, show a positive association for wood debris (deMaynadier 1995), both in regeneration areas and older stands. Of the 87 species that prefer old growth habitat, 35 require the down woody material component of old growth (MDC 1986). Downed woody material is vital in the riparian areas to provide a source of wood in the streams. In many locations across Missouri, the historic volumes of large woody material (LWM) in the streams are not present. Wood in many Ozark streams is essential to habitat formation, channel stability, etc.

Theme 8.5 - Effects of land conversion

PC# 246 - The Mark Twain National Forest should consider the effects of permanent land conversions on fish and wildlife resources.

PC# 246- Additional analysis of effects of permanent land conversions from road and trail construction, parking lots and new recreation facilities on fish and wildlife has added to the FEIS.

Theme 8.6 - Regeneration habitat

PC# 7 - The Mark Twain National Forest should emphasize the creation of large blocks of unbroken forest canopy.
A) Because large unbroken blocks of forest are rare in this region.
B) Because large unbroken blocks of forest provide critical habitat for a large number of species.

PC#7 - Goal 1.1 and 1.4 of the 2005 Forest Plan clearly state the Forest Service's intention to move toward management of natural communities as the primary method of providing wildlife habitat on the Mark Twain National Forest.

Openings created by natural disturbances are normally distributed in a "J" shaped curve – where there are many small openings, some medium-sized openings, a few large-sized openings, and those regeneration openings are not permanent. Standards and guidelines in the 2005 Forest Plan for regeneration openings recognize the need to have a full range of opening sizes (2005 Forest Plan pages 2-28 and 2-29; 3-7; 3-11; 3-34 and 3-38).

Many native wildlife species require openland habitat. In fact, some of the steepest declines in neotropical migratory birds are grassland or shrubland species. After almost 20 years of management under the 1986 Forest Plan, only about 7% of the MTNF is in permanent openland habitat and about 93% in forest cover – most in large blocks. We feel that management of some openland habitat is important to contribute to maintaining viability of those species which use openland habitat. Standards and guidelines which are found throughout the 2005 Forest Plan for soil and water protection, for use of pesticides, and

protection of other sensitive resources are designed to prevent or minimize adverse impacts to other resources when conducting forest management activities, such as maintaining openland habitat.

While this commenter prefers recreation associated with large forested blocks, other commenters have indicated their preference for recreation associated with openlands or edge habitat. The 2005 Forest Plan provides a wide range of recreational opportunities and experiences.

PC# 248 - The Mark Twain National Forest should adopt the old plan's minimal viable regeneration percentage requirements that are lower than the new proposed high requirements.

PC# 308 - The Mark Twain National Forest should change standards and guidelines regarding regeneration habitat.
A) By prohibiting regeneration habitat harvests.
B) Including standing dead trees guidelines as standards.
C) Including cavity or den trees guidelines as standards.

PC# 326 - The Mark Twain National Forest should replace regeneration openings with natural openings for terrestrial wildlife habitat.

PC# 341 - The Mark Twain National Forest should provide more analysis of forest regeneration.
A) By comparing effects of natural versus man-made disturbances on early successional habitat.
B) Including effects on wildlife.
C) Including effects of timber harvest and prescribed fire.
D) By considering temporary affects as "significant".
E) By considering establishment of standards for protecting rare species and key habitat.
F) Including contributions by natural processes and oak decline.

PC#248, #308, #326, #341 – We have reviewed the guidelines pertaining to percent of regeneration openings in MP 2.1, 6.1, and 6.2, and agree that they should be changed in two ways.

First, these guidelines do not describe limitations or permissions for implementation of on-the ground activities. Rather, they describe a desired condition to be met in the future. Including these as guidelines could imply that each project should provide regeneration areas, but this is something that could only be determined on a site-specific, project level basis. Therefore, the guideline regarding regeneration openings is part of the desired condition described for each of these management prescriptions, and as such will help form the purpose and need for site-specific projects. Second, we have revised the desired percentages of regeneration areas for MP 2.1 and 6.1 by reducing them to 8-15 % for MP 2.1 and 1-5% for MP 6.1. Any natural regeneration which might occur across the forest will be accounted for within this amount. The regeneration guidelines outlined in the 2005 Forest Plan are based on the 1986 Forest Plan and represents what we feel are appropriate for species requiring early seral habitat. Regeneration areas are a primary source of early successional stages in a forest environment and are a controlling factor in population density for some species. Natural openings (natural grasslands) are covered under the 'Grassland Habitat' section.

Natural disturbances (wildfire, wind, and storms) maintained early successional habitat prior to European settlement. Fire suppression has substantially reduced the amount of early forest habitat, resulting in a decline of numerous early successional species.

Because the Forest recognizes the important contributions that early successional natural communities make to biodiversity at the landscape scale, early successional habitat continues to be a strong emphasis in the 2005 Forest Plan. Approximately 7.5% of the total forest per decade is proposed for regeneration cuts. Additional early successional areas will continue to be created through natural processes such as blow-downs, fires and other natural processes. Scientific literature shows that shrub-dominated areas (regeneration areas) are important to a number of neotropical migrant bird species such as the prairie warbler, blue-gray gnatcatcher, blue-winged warbler and yellow-breasted chat.

For the 1986 Forest Plan, Forest Service and MDC professionals developed the wildlife standards and guidelines over a period of time. Pattern Recognition (PATREC) Models were constructed for the 1986 Plan to determine habitat objectives for each MIS. These models provided a method to identify important habitat characteristics for MIS and using habitat conditions, to provide estimated population capabilities. These models, along with rotation ages and age classes, were used to determine age class percentages for each management prescription. The regeneration openings guidelines are not only to provide for species viability, but to improve the long-term distribution of age classes. The FEIS includes additional effects of management activities on early successional habitat and species.

See response to PC#281 (Theme 8.1) concerning oak decline and early successional habitat.

More detailed discussions of the impacts of early successional forest types to bird species are available in the planning record.

PC# 368 - The Mark Twain National Forest should count woodland and savanna conditions towards meeting early successional wildlife habitat.
A) By considering requirements used by Arkansas' Quachitau National Forest.
B) By considering those conditions that exist on nearby private land.
C) And recognize that provision of early successional habitat on adjacent private lands should be balanced by providing greater amounts of old-growth habitat.

PC# 368 A, B, C - The Forest Service has fully recognized that savanna and many open woodlands provide the type of shrub/grass habitat preferred by many Ozark plant and animal species. Goal 1.1 (2005 Forest Plan page 1-1) clearly shows the intent of the Forest Service to manage native natural communities across the Forest. Goal 1.4 (2005 Forest Plan 1-3) further clarifies the intent to restore and manage natural communities, such as savannas and open woodlands, as the primary method of providing quality habitat.

Management prescriptions 1.1 and 1.2 were developed specifically to target restoration of these natural communities in areas of high biodiversity. Appendix A of the 2005 Forest Plan describes these areas. Within these areas, restoration and enhancement will provide the majority of early successional shrub-grass habitats. No set amount of any particular habitat type has been designated, since each area of the landscape is unique and restoration activities will determine where and how much of each natural community and successional stage is present over the long-term. In other areas of the Forest (primarily Management Prescription 2.1), shrub-grass habitats will be provided primarily by creating regeneration openings. Both types of habitat are important to assure that shrub/grass habitat is well-distributed across the Forest.

Open woodlands and savannas certainly provide habitat conditions that are suitable for many shrub and some shrub/grassland plant and animal species. In recognition of that, the 2005 Forest Plan has been changed to include savannas and open woodlands as types of shrub, grass, forb habitat that are key habitat components (2005 Forest Plan page 2-8).

PC# 399 - The Mark Twain National Forest should seek to restore early successional habitat on lands harvested in the recent past (0-15 years), and abstain completely from

harvesting mature forests to re-create early successional habitat.
A) Because there are enough early successional forests to reach habitat goals.

PC# 399 - We respectfully disagree with the commenter that there is a problem with the way MTNF approaches succession, early successional habitat and disturbance, and that forest management as practiced on MTNF will result in eroded soil and an unproductive forest. The 2005 Forest Plan is designed to provide the full range of habitat conditions needed by native Missouri plants and animals using a variety of management techniques and practices. These are not flawed simply because the commenter disagrees with their use on public lands. The FEIS clearly describes the rationale for developing Management Prescriptions and standards and guidelines based on ecological sustainability (FEIS pages 3-59 through 3-63). See also Appendix D of the FEIS, and Appendix A of the Forest Plan.

Although the commenter implies that MTNF is a wasteland of early successional areas and lacks mature forest, the facts are that after almost 20 years of implementation of the current Forest Plan, only about 2.5% of the Forest is in early successional habitat created by regeneration harvest (0-9 years old), while about 74% is in mature forest cover (>= 50 years old).

Theme 8.7 - Scientific basis for analysis

PC# 293 - The Mark Twain National Forest should provide scientific evidence supporting claims that alternatives meet minimum viability needs of wildlife and plants.
A) Including how prescribed burns help and harm different species.
B) Including how discussion of how and why human activities are needed to mimic historic disturbances for restoration.

PC#293 - The effects analysis for wildlife and plants was based on a huge body of scientific information as well as the professional integration of this knowledge with the practical experience of managing Ozark ecosystems. The body of knowledge is contained in databases managed by the Forest Service and Missouri Department of Conservation; and scientific research as documented in published papers, theses, doctoral dissertations, and in unpublished files. As an example of the kinds of information used, please see Chapter 6 – References in the FEIS. Boxes of additional information are found in the Project Record. Monitoring of oak decline conditions has been accomplished through analysis of Forest Inventory and Analysis (FIA) data, aerial photography, and field inspections.

Theme 8.8 - Wildlife Standards and Guidelines

PC# 298 - The Mark Twain National Forest should change standards and guidelines for caves and abandoned mines.
A) By describing recommendations made by the Cave Research Foundation for public scrutiny.
B) Including making guidelines for locations of new trails into standards.
C) Including standards maintenance of gates.
D) Including changing standards for caves suspected as used by Indiana or gray bats to include fall swarming areas.
E) Including new standards for impacts that affect the climate of caves.
F) Including the need for new gates depending on bat species use.
G) Including periodic monitoring to detect trespass and vandalism.
H) By clarifying its intent regarding firelines.

PC# 298 A, B, C, D, E - The intent of including the standard regarding Gardner's inventory and evaluation of cave resources was to insure that managers would consider those recommendations when proposing activities near a cave. To avoid confusion, this standard has been removed from the 2005 Forest Plan.

We agree that older gates that alter airflow should be replaced. However, at the present time, there is only one gate on MTNF which may not meet current standards, and the bat population at that cave is steady. There is nothing in the 2005 Forest Plan that prevents us from replacing older gates. Those decisions would be made on a site-specific basis after considering all relevant information. However, the suggested change, to add "or replace" has been made in the 2005 Forest Plan.

The minimum 20 acres of old growth and additional 130 acres of mature forest or woodland around gray or Indiana bat caves is designed to protect the microclimate of cave entrances. Impacts to gray and Indiana bat caves are discussed in the Biological Assessment for the 2005 Forest Plan.

The guidelines which the commenter suggests be made standards were developed by the ID team, considering a wide variety of factors. After lengthy discussions, the ID team determined that these were more appropriately guidelines than standards. A guideline must still be followed, unless the rationale for not following it is explained in the appropriate NEPA document.

PC# 298 F, G - We agree that new gates may be needed to protect a variety of cave resources. The 2005 Forest Plan does not prohibit construction of new gates. The decision to protect a cave with a physical closure would be made on a site-specific basis, after considering all relevant information. The 2005 Forest Plan does require that any structure placed at a cave entrance be constructed to allow free passage of bats and not alter airflow (2005 Forest Plan page 2-12). We have also added two new standards and guidelines to the 2005 Forest Plan that address monitoring of cave gates.

PC# 298 H - Firelines would be constructed either 50 to 100 feet from the entrance of caves or mine shafts. The intent is to minimize ground disturbing activities with in the immediate vicinity of the openings.

PC# 299 - The Mark Twain National Forest should change goals, standards and guidelines regarding Wildlife Management.
A) Including a standard for monitoring Hines' Emerald Dragonfly.
B) Including age-class wildlife management objectives.
C) Including artificial openlands.
D) Including timber harvesting impacts.
E) Including old growth habitat, and accounting for natural succession.
F) Including how information was collected regarding early successional habitat.
G) By assessing impact of 500 acre cuts.
H) By assessing impact of harvest on salamanders and other species.
I) By protecting large oaks for woodpeckers.
J) By including clear goals for maintaining and strengthening viable populations of native species.
K) By addressing the fact that the numbers of some native species populations may be abnormally high, due in part, to past forest management, and that their maintenance at that level may be detrimental to native species with less vigorous numbers.
L) Including goals for the Indiana Bat.
M) Including making the guideline for signage at accesses to rivers or lakes where eagles may be present a standard.

PC# 299 A - Monitoring and evaluation of TES habitat and the effects of forest management activities is included in Chapter 4 of the 2005 Forest Plan.

PC# 299 A, B, C, D, E, G - The purpose of identifying desired conditions for a range of variability of structures, composition, basal area and ground cover is to recognize that the

landscape of southern Missouri naturally supports a variety of habitat conditions, from openings to open woodland, from glades to riparian bottomland forest, and from early successional forest to old growth. Maintaining openland habitat has nothing to do with "getting the cut out", but is a recognition that some artificial openlands may provide habitats useful to species that depend on open conditions. The 2005 Forest Plan clearly states the intention to emphasize the restoration and management of natural grasslands (2005 Forest Plan page 2-9) as the preferred means of providing openland habitat, and that maintenance of artificial openlands is limited to specific areas and situations. Artificial openlands are not the same as clearcuts, and it appears that the commenter has confused the two.

Restoration cuts up to 500 acres would be done only to restore savanna conditions in very limited circumstances. The effects of this type of management are disclosed in the FEIS on pages 3-76, 3-90, 3-121, 3-137, and 3-150.

Specific direction contained in the Healthy Forest Initiative and Healthy Forest Restoration Act applies only to projects conducted under those authorities. This direction is to maintain or contribute toward restoration of structure and composition of old growth stands according to pre-fire suppression old-growth conditions characteristic of the forest type. The old growth contribution of each site-specific project is appropriately addressed during project analysis. The 2005 Forest Plan direction for old growth habitat is found on page 2-8 and 2-9, and shows that MTNF is maintaining and contributing toward old growth structure and composition across the Forest, regardless of the funding mechanism or authority.

PC# 299 E,F,H,I - Big Oak Tree State Park is managed by the Department of Natural Resources, not the Forest Service. The type of large, swamp habitat that the ivory-billed woodpecker was found in does not occur on MTNF. The state of Missouri has not changed their status (extirpated) for ivory-billed woodpecker since its discovery in Arkansas.

The FEIS does not ignore impacts of forest management to salamanders. Six salamanders were included in the Species Viability Evaluation, summarized on pages 3-62 and 3-129 through 3-160 of the FEIS.

Early successional habitat for the 1986 Plan was defined as 0-9 age class, normally created through regeneration harvest. Monitoring of oak decline conditions has been accomplished through analysis of Forest Inventory Analysis (FIA) data, aerial photography, and field inspections.

Old growth designations under the 2005 Forest Plan will be made on a site-specific basis considering all relevant factors, including previous designations. The Forest Service has recognized dead and downed woody vegetation and dead snags as important habitat components. The 2005 Forest Plan includes these components in Goal 1.4 – Wildlife and Aquatic Habitat (page 1-3), and contains standards and guidelines to provide these components across the landscape (pages 2-8, 2-9, 2-15, 2-27 and 2-28). In addition, providing snags and downed woody material was identified as one of the conservation approaches needed to contribute to viability of all species and the ability to meet this conservation approach was assessed (FEIS pages 3-131 through 3-160).

While the Forest Plan and EIS do not specifically discuss every species individually, the Species Viability Evaluation for MTNF started with over 1600 plant and vertebrate and invertebrate animal species that could occur on MTNF (including all those species mentioned by the commenter). An ecosystem level (coarse-filter) approach was used to insure habitat availability for most species, resulting in Forest-wide standards and guidelines. For some species or some habitat components, a species level (fine-filter) approach was needed to insure specific habitat components, resulting in species specific standards and guidelines. In

addition, Management Indicator Species and Management Indicator Communities represent other species, including many of those mentioned by the commenter (FEIS page 3-116).

PC# 299 J, K, L - Goal 1.4 clearly states that the Forest Service supports recovery of Federal and State listed species (which would include any reintroductions proposed by US Fish and Wildlife Service), protection and management of habitat for regionally listed species, and protection and management of habitat for other identified species of concern. Because the Mark Twain National Forest is only a fraction of the land in Missouri, maintaining viable populations of any species, is not normally feasible on National Forest lands alone. The Mark Twain National Forest's contribution to sustaining viability of all native species, including those federal or state listed, is to provide the range of natural habitats that is appropriate for those landscapes that occur on National Forest lands. This is the "coarse-filter" approach that is widely considered the most effective way of maintaining viable populations of native species (see Introduction to Ecological Sustainability and Ecosystem Health in the FEIS).

PC# 299 K - The commenter has provided no evidence to support their contention that "Many species have unnatural population levels due to things like logging." To our knowledge, there are no native species that have unnaturally high population levels on MTNF. Based on breeding bird surveys, research, and personal observations, cowbird levels on MTNF are not abnormally high (FEIS page 3-124), and in fact, do not pose the same level of threat to other native bird species that is found in more fragmented, agricultural landscapes. (FEIS page 3-138; Clawson et al. in Shifley and Kabrick eds. 2000; Fitzgerald and Pashley 2000).

The maintenance of Indiana bat roost trees is a priority on the Forest, as shown on page 2-6 and 2-7 of the 2005 Forest Plan. In addition, through informal consultation with US Fish and Wildlife Service, standards and guidelines for occupied roost trees have been changed in the 2005 Forest Plan to provide additional protection.

PC# 299 M - Educational signing along rivers and lakes where eagles may be present was carefully considered and was determined to be a guideline to provide flexibility to address site-specific conditions. In some areas, signs may call undue attention to eagles actually increasing the risk of disturbance, and in others, signs may be appropriate to minimize impacts. Those decisions are properly made after site-specific analysis and consultation with US Fish and Wildlife Service. Guidelines must be followed, unless the rationale for doing something different is explained in project specific analysis.

PC# 303 - The Mark Twain National Forest should change standards and guidelines regarding vegetation management.
A) By clarifying the Running Buffalo Clover standard.
B) Including making guidelines for leaving snags, dens, cavity trees, and downed woody debris into a standard.

PC# 305 - The Mark Twain National Forest should change standards and guidelines regarding cliffs, rock bluffs, and outcrops.
A) Including making all of the guidelines into standards.
B) By clarifying "Natural Heritage Database".

PC# 303 A - Commenter is correct that this standard is awkwardly worded. The intent was to introduce some disturbance into potential running buffalo clover habitat. However, there are currently no known sites of this species on the Mark Twain National Forest. In the 2005 Forest Plan, this standard has been deleted. If running buffalo clover is discovered on the Forest in the future, we would consult with the U.S. Fish and Wildlife Service to develop appropriate standards or guidelines to be added to the Forest Plan in an amendment.

PC# 303 B and 305 A- A "guideline" is a course of action that should be followed in most circumstances. They provide important resource protection. However, guidelines relate to activities where site-specific factors may require some flexibility. Deviations from a guideline must be analyzed and documented in a project level analysis but do not require a Forest Plan amendment while deviations from a "standard" require a Forest Plan Amendment. In the case of dealing with snags, dens, cavity trees, and downed wood, and those dealing with cliffs, rock bluffs, and outcrops, the intent is to keep these components and minimize disturbance to them wherever possible, recognizing that there are some situations in which it is not possible.

PC# 305 B – The "Natural Heritage Database" referred to in the plan is the one created and maintained by the Missouri Department of Conservation.

PC# 307 - The Mark Twain National Forest should change standards and guidelines regarding grassland habitats, glades, and openlands.
A) Including conversion to use of fescue natural grasslands.
B) Including guidelines for firefighting as standards.
C) Including guidelines for maintaining artificial openlands as standards.
D) Including wildlife plots.
E) Including removal of some guidelines for maintaining artificial openland.
F) Including greater protection of glades containing numerous endemic species.

PC#307– A "guideline" is a course of action that should be followed in most circumstances. They provide important resource protection. However, guidelines relate to activities where site-specific factors may require some flexibility. Deviations from a guideline must be analyzed and documented in a project level analysis but do not require a Forest Plan amendment while deviations from a "standard" require a Forest Plan Amendment.

The ID team feels that the standards and guidelines sufficiently protect natural grasslands, including glades, native prairies and seeded or planted native grass sites. The ID team also feels that not all non-native openlands can be feasibly converted to natural grasslands, that there may be a need to non-native openlands (wildlife food plots), and that some non-native openlands may meet objectives of other resources.

The standard requiring at least 30% of the seed to be native forbs when converting non-native openlands to natural grassland allows for up to 70% of the seed to be in the form of a crop.

Theme 8.9 - Comparison of Alternatives

PC# 4 - The Mark Twain National Forest should conduct a more thorough comparison of alternatives.
A) Including Range of Natural Variability.
B) Including how much habitat is available on private land.
C) To address neotropical migrants and salamanders.

PC#4 - The FEIS addresses potential effects at a programmatic level and addresses effects in enough detail for the deciding official to be able to make a rational choice between alternatives. Alternative comparisons are found throughout Chapter 3 of the FEIS, and in particular, are summarized on pages 2-19 through 2-40. The commenter's requests for additional analysis have been considered by the ID team. Many of the requests are outside the scope of the Plan decisions, or are more appropriately addressed at the site-specific project level. The ID team supports the analysis as completed and has determined that the additional information requested is not necessary for the deciding officer to make a reasoned choice between alternatives.

Theme 8.10 - Species Tracking

PC# 377 - The Mark Twain National Forest should use a broad base of species tracking.

PC#377 - The Forest Service agrees that well-planned data collection is essential to effective forest management. However, even well planned data collection can be time-consuming and expensive. Therefore, when identifying items to be monitored and evaluated (see Chapter 4 of the 2005 Forest Plan), the ID team carefully considered the applicability of the information that would be gathered, and chose monitoring items that complied with laws and regulations, or that would provide useful information regarding forest management that would help us make better decisions in the future. MTNF continues to work with NCFRS and other partners to develop and implement an effective monitoring strategy.

NFMA and the planning regulations do not require that the Forest must use any particular type or method of species tracking. With regard to which species are monitored, a March 2005 Chief's Appeal Decision (#04-13-00-0014, *et al.* at page 6) notes that:

> NFMA regulations do not require that [Management Indicator Species] be selected to represent every management activity proposed within a planning unit. Forests are required to use a deliberative process for the selection of [Management Indicator Species] and to state the reasons for their selection.

See also Forest Service Manual 2621.1. Likewise, there is no NFMA or regulatory requirement that management indicator species be selected to represent every major habitat type, from particular categories (e.g. sensitive species), or selected because another Forest selected it. Neither NEPA nor NFMA require MIS to vary by alternative. Even though a species was not selected as a management indicator species, it may still be monitored under other programs or efforts (e.g. annual breeding bird surveys, or as part of compliance with Terms and Conditions of Biological Opinions). The interdisciplinary team for the 2005 Forest Plan followed a deliberative process to select management indicator species. (FEIS, page 3-115 and project record).

Monitoring provisions in the NFMA regulations provide considerable discretion to the local decision-makers to determine what to monitor and how best to accomplish the task (*see* 36 CFR 219.11(d), 219.12(k), 219.19(a)(6); see also Forest Service Manual 2621.5). Indeed, the terms monitoring and monitoring plan are not defined in NFMA or its regulations. The 2005 Forest Plan, Chapter 4, contains monitoring and evaluation direction in compliance with all monitoring and evaluation requirements of the NFMA regulations. Our intent is to ensure that the monitoring and evaluation strategy is implemented and funds are requested to ensure that monitoring is completed in a timely fashion. Monitoring is a priority and every effort will be made to ensure that funds are available to implement the monitoring strategy. The programmatic monitoring strategy does not contain or dictate monitoring indicators for site-specific projects.

Although some may prefer an even broader base of species tracking, given limited time and resources, monitoring is tailored to provide the Forest with the information needed to track resource conditions. A primary goal of monitoring is to provide information for future programmatic decision-making, i.e. to determine when and how future programmatic adjustments will be made. At the programmatic level of decision-making, the species tracking is sufficiently broad to inform the decision-maker as to current conditions and the need to adjust the Plan.

There will always be another animal or resource attribute to monitor and evaluate. Things that can be monitored are limitless; money and people to monitor are not. Under the discretion provided by NFMA and its regulations, the 2005 Forest Plan sets for a wildlife

monitoring framework that will accomplish the primary purpose for which it is intended - the tracking of resource conditions under the framework of the 2005 Forest Plan. Making the species tracking broader will not enhance the Forest's ability to evaluate the 2005 Forest Plan and will likely divert scare resources away from other more important resource monitoring. The Forest has considered the request to broaden the base of species tracking and concluded that the existing monitoring is sufficient; additional monitoring would produce a small gain at considerable marginal cost.

General Theme 8A - Old growth

Theme 8A.1 - Maintain and/or increase Old Growth

PC# 174 - The Mark Twain National Forest should protect old growth areas.
A) To protect recreational uses.
B) To protect wildlife habitat.
C) By reducing timber harvest
D) In combination with pine and glade restoration and reduction in number of roads.
E) By using uneven-aged management.
F) By reducing the number of road miles.
G) Because there is only eight percent of the forest in old growth stage.
H) Including designations in restoration areas.

PC# 174 - The amount of permanent old growth to be designated is what we feel to be the minimum needed to contribute to viability of species. This will provide the larger blocks needed by forest interior birds, as well as down woody material, snags, multi-layered structure and canopy gaps on which other species are dependant. In addition to the old growth designated in MPs 2.1, 6.1 and 6.2, Wilderness, riparian areas, recreation areas, steep slopes and other unsuitable lands could contribute to old growth acres as they mature.

With natural community restoration in MPs 1.1 and 1.2, old growth stands will develop naturally. A standard is being added to MPs 1.1 and 1.2 to provide for the full range of variable conditions from regeneration openings to areas exhibiting old growth characteristics within each natural community and with the predominant age of areas representing old growth character at least 25% above the rotation age. Therefore, significant amount of older age classes will be balanced with other variable age groups of vegetation to mimic age-class structure for historical natural communities.

Uneven aged management does not create any more old growth than even aged management. Under either silvicultural system, the amount of old growth is dependent on how the system is applied.

Although the 1986 Forest Plan designated old growth, the lands were not taken out of the suitable land base, even though timber production was not planned in these areas. The 2005 Forest Plan is correcting this error and removing old growth from of the suitable land base. In the past we have not logged in the seven sensitive areas and do not plan to in the future; therefore to determine an accurate Allowable Sale Quantity, we have taken these lands out of the suitable land base.(see Timber Supply, Lands suited to timber production, page 3-25 of the FEIS). Classification of lands suitable for timber management is a different process from the determination of what acres will be designated as old growth.

Theme 8A.2 - Do not designate Old Growth

PC# 175 - The Mark Twain National Forest should not designate any additional areas as old growth.
A) Until a reasonable approach for the long term management of old growth areas is

established.
B) Because it cannot be harvested and is expensive to renew.
C) including a set percent of old growth for given harvest levels that are below growth rates.

PC# 175 - We respectfully disagree that additional old growth designation is not necessary. Many species of wildlife in Missouri prefer the vegetative and structural characteristics that can only fully develop in old growth (FEIS page 3-91, 3-96 and 3-97). In the preferred alternative, about 4-5% of MTNF would be designated old growth.

Although current laws and regulations don't mandate management for old growth conditions, various laws have provisions to sustain viable populations of native plants and animals, as well as maintaining and enhancing the diversity of plant and animal communities. In Missouri, at least 87 animal species use old growth habitat and the characteristics it provides. The limited amount of old growth required for permanent designation would provide the minimum requirements of these species. Stands and blocks of stands are being designated as old growth, so that when the sites achieve the characteristics representative of old growth communities such as large trees, down woody material, snags, multi-layered structure and canopy gaps, these stands will remain to provide habitat for the old growth dependent species. The revised plan provides standards and guidelines allowing management activities to meet these desired characteristics. Not permanently designating areas as old growth could result in a continual harvest of older, larger sawtimber stands that have attained old growth characteristics, resulting in a loss of habitat attributes and possibly reducing species viability.

Some areas, such as steep slopes and other unsuitable lands (that are already taken out of the suitable acres) will be designated as old growth, thus reducing the overall acreage that will be taken out of timber suitability.

Long-term management for old growth consists of retaining old growth areas and allowing them to regenerate naturally. Prescribed burning and silvicultural activities could occur to enhance old growth characteristics. Like other seral stages and forest types, old-growth forests are dynamic forests that do not last forever.

Page 3-93 of the FEIS does not state that we will be designating 11-19% (depending on alternative) in MP 1.1 and 1.2 as permanent old growth. There are no standards or guidelines in MP 1.1 or 1.2 addressing the designation of permanent old growth. We have added standards and guidelines in these two management prescriptions that provide for the full range of variable conditions (from regeneration openings to areas exhibiting old growth characteristics) to be present for each natural community and that allow the predominant age of areas representing old growth character be greater than 25% above the rotation age used for timber management. This would provide for a more balanced age class distribution across the MPs.

Designation of old growth areas is needed to ensure that the areas are identified, designed for, and available across the forest for wildlife needs. Rotation ages and the amount of regeneration harvest that may occur may result in old growth stands scattered across the forest; but these stands are not managed for old growth conditions and may not meet large, contiguous area requirements.

Theme 8A.3 - Manage Old Growth

PC# 129 - The Mark Twain National Forest should be consistent in its removal of understory.

PC#129 -Current stand data for MTNF shows approximately 3,600 acres over 175 years of age. We recognize that the standards in the 2005 Forest Plan on page 2-27 (also on pg 2-9)

concerning activities allowed in 175-year-old stands can be read differently from the next standard allowing activities in regular old growth stands. While some stands may show an average age less than 175 years, they may contain scattered, widely spaced 175-year-old groupings (especially post oak) that once represented open woodlands or savannas. These may be reevaluated and included under the standard excluding 175 year old stands. We have rewritten the two standards concerning harvest within old growth stands and areas over 175 years of age to clarify them.

Additional standards and guidelines within MP 1.1 and 1.2 have been added to provide for the full range of variable conditions from regeneration openings to areas exhibiting old growth characteristics.

PC# 177 - The Mark Twain National Forest should provide a clear management approach for old growth areas.
A) By increasing rotation ages.
B) By describing how old growth will be managed in the future.
C) By decreasing rotation ages for red oaks.

PC#177A, C - Rotation ages are used in forest management to guide how the forest will be managed and used to determine harvest scheduling. Many factors are used to develop rotation ages such as species, site class, and overall management objectives. The objective of timber management by itself is to achieve the highest economic returns the site can produce in the shortest period. For the Mark Twain NF, other factors such as ecosystem restoration, wildlife habitat objectives, visual objectives, etc. are also considered. The only restriction to setting a rotation age is found in Section 6 of the National Forest Management Act of 1976 "… prior to harvest, stands of trees throughout the National Forest System shall generally have reached the culmination of mean annual increment of growth …" This applies to regeneration harvests and not thinning or salvage operations. For the Mark Twain NF, culmination of mean annual increment (CMAI) for Shortleaf Pine and mixed oaks is 40 to 50 years old. From a purely silvicultural viewpoint, we normally would not regenerate a stand until 40 to 50 years old.

The physiological maturity or forest type groups for Missouri is shown in the table below (1920 Letter to the files 1983, data provided by Ivan Sanders, Silviculture and Ecology of Oak-Hickory Forest Ecosystems, Project Leader, North Central Forest Research Station). Difference in physiological character may not always be accompanied by morphological differences.

Black – Red oak Group	130-150 years old
Scarlet oak	85 years old
Shortleaf Pine	100 years
White oak group	200-250 years

For intensively managed shortleaf pine and oak-pine stands, the economic rotation would usually be 70 years or less, but on good sites the rotation may be as long as 90 years. (Timber Management Guide for Shortleaf Pine and Oak-Pine Types in Missouri, K.A.Brinkman and N.F.Rogers, Research Paper NC-19, 1967). Oak species in general terms have been managed on 80 to 100 year rotation (RB NC-30, 1972) with individual species such as scarlet oak being managed for a 70-year rotation.

See also response to PC# 43 (Theme 7.1) regarding old growth in MP 1.1 and 1.2

PC#177 B -We are unsure where the commenter came up with 189,000 acres being designated to develop into "natural community" old growth over the next 100 years. However, Forestwide standards and guidelines and management prescriptions contain direction addressing the management of old growth areas. Objectives for old growth would

provide 80,000 to 120,000 acres permanently designated as old growth within MP 2.1, 6.1, and 6.2. These areas would be managed to enhance natural communities and old growth characteristics. The FEIS discusses various old growth characteristics (pages 3-91 through 3-92) in which characteristics of some old growth stands or areas will fall outside of the Historic Range of Variability due to lack of management, as artifacts of resource exploitation following European settlement or due to unnatural succession. The effects of "no management" are discussed in on pages 3-74 and 3-75 of the FEIS. Standards (page 2-7 of the 2005 Forest Plan) allow for silvicultural activities in old growth only when the objective is enhancement of natural communities and old growth characteristics. These determinations are made during project analysis.

PC# 350 - The Mark Twain National Forest should consider that designating old growth as part of the suitable timber base is a more viable plan that to do nothing with the old growth areas.

PC#350 - Although the 1986 Forest Plan designated old growth, the lands were not taken out of the suitable land base, even though timber production was not planned in these areas. The 2005 Forest Plan is correcting this error and removing old growth from the suitable land base. In addition, acreages of old growth which overlapped with riparian areas, steep slopes, cave areas, recreation areas, sensitive areas and other nonsuitable lands were not added twice to the unsuitable acres.

There is a clear management approach for old growth areas. See page 2-7 of the 2005 Forest Plan for Forestwide Standards and Guideline for Old Growth. Rotation ages would be extended indefinitely where permanent old growth is designated and old growth characteristics are present.

Based on the 1986 Forest Plan and the judgment of professional wildlife biologists with the Forest Service and Missouri Department of Conservation, we feel that a range of 8-20% of designated old growth is appropriate. The best available scientific information states that old growth is necessary for species viability, but does not give a percentage or acreage needed.

Theme 8A.4 - Old Growth Standards and Guidelines

PC# 309 - The Mark Twain National Forest should change standards and guidelines regarding old growth habitat.
A) By clarification of criteria including community type representation requests.
B) Including how age of a stand will be determined.
C) Including prohibiting the selling of trees.
D) Including prohibition of salvage.
E) Including impacts of salvage on old growth.
F) Including exceptions for minimum size areas for adjacent areas.
G) Including an account of contiguous old growth habitat provided by the wilderness acreage.
H) Including leaving cut trees in place unless directly over a road or trail
I) Including increasing the rotation ages for timber management.

PC#309 - Page 3-107 of the FEIS discusses the acreage percent that wilderness and other areas, such as recreation areas, eligible rivers and special areas, would provide towards old growth and large patches.

The minimum old growth acreage is the combined acreage of all stands designated as old growth. Therefore, if a small stand (less than 15 acres) is adjacent to wilderness, roadless or existing old growth areas, its acres would increase the area.

Standards and guidelines for wilderness areas (MP 5.1), recreation areas (MP 7.1), special areas (MP 8.1), and eligible rivers (MP 6.3) provide for the continued development and enhancement of old growth characteristics and habitat conditions for old growth species. Salvage would not occur in wilderness areas. In other old growth areas, salvage would only occur when an unacceptable risk to public health or safety, or threat to forest health occurs. Otherwise, trees posing an acceptable risk would be left on site to provide down woody material which would enhance the old growth characteristics. Trees not posing a risk would remain as snags, again providing old growth characteristics.

See also response to Theme 8A.3 discussing the rewriting of standards concerning harvest within old growth stands and areas over 175 years of age to clarify them.

The Standard specifically states to "Designate areas of permanent old growth…". If we had said "Designate an area of permanent old growth…" we would understand how the meaning would be misconstrued. We feel the area meaning is clear in that we want some old growth areas designated across the landscape and in all forest, woodland, and savanna natural community types.

Dead and down woody material is a component of old growth (according to desired characteristics of this natural community) and is a management objective for old growth. Cutting within old growth areas would only be done when the objective is enhancement of natural communities and old growth characteristics.

Management prescriptions 2.1, 6.1, and 6.2 each included a standard requiring the designation of a percentage of each management area as permanent old growth. While examining these standards in response to the many comments received regarding old growth management, it became obvious that these were actually goals and objectives, not standards. Standards are by definition permissions or limitations on on-the-ground activities. Although presented as standards, these required percentages actually described a desired condition. Therefore, we changed these standards regarding old growth designation to an objective. This change will still require the designation of a percentage of these management areas as permanent old growth, because compliance with objectives is not optional, given necessary funding. This change also provides more flexibility in designating permanent old growth throughout a management area to meet the needs of a variety of species.

General Theme 9 - Threatened, Endangered, and Sensitive Species

Theme 9.1 - Indiana bat

PC# 143 - The Mark Twain National Forest should provide a description of how management of the Indiana Bat might change as a result of reducing Management Prescription 3.5 designations.

PC# 170 - The Mark Twain National Forest should change standards and guidelines for the Indiana Bat.
A) To clarify if there are areas where all suitable roosts would be removed or if a minimum number of suitable roosts will be left in all areas that are currently suitable for the species.
B) Including protection for maternity colonies.
C) Including protection during periods of swarming and staging.
D) Including an adaptive management program regarding competition with the gray bat.
E) To provide for protection of aquatic insect and other food sources.
F) Including areas of influence for hibernacula.
G) Because they are inadequate.

H) Including mist-netting and radio-tracking both females and males to determine where roost trees are located.
I) Including an increase in buffer zones.
J) Including a survey for the presence of any activity that could affect the Indiana Bat.
K) Including a comparison of the standards and guidelines with the existing plan.
L) Including how data was collected for the effects on bats.
M) To provide assurances that roosting will not be impacted by a variety of forest activities.
N) To provide more monitoring.
O) To ensure adequate roosting.

PC#143, PC#170 – The biological assessment compares the differences and similarities between MP 3.5 designations and the plan revision, and how the new standards and guidelines address the components contained within MP 3.5. FEIS, Chapter 2, Table 16 displays how each habitat need is addressed and/or provided in all alternatives. See also page 3-176 through 3-178 of the FEIS for more analysis.

Standards and guidelines for the Indiana bat have been rewritten and added to provide additional protection for the species, providing the same or better protection for the species than measures outlined in MP 3.5 Area of Influences. Edits made to the FEIS and the Biological Assessment discuss the issues of competition between gray and Indiana bats, impacts to foraging and prey species, pesticides, as well as numerous other issues affecting the Indiana bat and other threatened and endangered species within the Mark Twain NF.

PC# 168 - The Mark Twain National Forest should not restrict timber harvest.
A) Because there is not evidence of what is causing a decline in bat populations.
B) And implement research programs to better assess impacts of timber management on threatened and endangered species.
C) Because it provides jobs for Missourians and money to the state economy.

PC#168 – The only timber restrictions pertaining to Indiana bat are: identify and remove hazard trees between November 1 and April 1 whenever possible; avoid removal of suitable roost trees in the swarming and staging periods-dates to be determined individually around each Indiana bat cave; maintain trees with characteristics of suitable roosts (i.e., dead or dying with exfoliating bark or large living trees with flaking bark) wherever possible with regard for public safety and accomplishment of overall resource goals and objectives; protect occupied Indiana bat maternity and male roost trees from physical disturbance until they naturally fall to the ground; minimize human disturbance in the foraging and roosting areas of the maternity colony until the colony has left the maternity area for hibernation; maintain or enhance the site year-round by (1) maintaining an adequate number of snags, including known roost trees; (2) maintaining large live trees to provide future roosting opportunities; and (3) protect male roost trees from physical disturbance by designating a 75-foot radius buffer zone around the tree(s) during the summer season (not migration) with no ground-disturbing activity or timber harvest occurring until hibernation season begins (around November 1); prohibit skid trails within 100 feet of cave entrances.

Although these restrictions may seem to affect the entire forest, in reality most only impact a small area immediately around the Indiana bat caves and roost trees. In fact, timber harvesting is necessary to move the forest to more open woodland habitat which exhibits preferred foraging habitat characteristics of more open canopy and understory. The Mark Twain NF is currently involved in Indiana bat research, with Missouri Department of Conservation, US Fish and Wildlife Service, North Central Research Station, as well as other organizations to better determine habitat needs and uses on Mark Twain NF.

Page 3-175 of the FEIS states that Indiana bat conservation "seems to be compatible with forestry practices that maintain structural features important to their roosting and foraging needs such as snags for roosting and small openings and edge habitats, especially along streams, for foraging." (Bat Conservation International 2001).

Theme 9.2 - Hellbender

PC# 122 - The Mark Twain National Forest should provide protection for the Ozark hellbender.
A) Because of their intrinsic value.
B) With an evaluation for the presence of Ozark and Eastern Hellbenders prior to any decision to remove a river bridge and other material from the water.
C) With an evaluation for the presence of Ozark and Eastern Hellbenders prior to the construction of public accesses.
D) Including avoiding channel alternations or impoundment structures that eliminate shallow water or remove cover rocks.
E) Including erosion and sediment controls to reduce siltation.
F) Including avoiding in-stream gravel mining where hellbenders occur.
G) Including enforcing existing regulations and increase investigative leads of illegal collecting of Hellbenders.

PC#122 – Forest Plan Revision Goal 1.4 – Wildlife and Aquatic Habitat, states to 'Restore and manage natural communities as the primary means of providing quality terrestrial, karst, and aquatic wildlife and rare plant habitat.' And 'Support recovery of Federal and state listed species, protection and management of habitat for regionally listed species, and protection and management of habitat for other identified species of concern.'

In addition, standards and guidelines for riparian areas, watercourse protection zones, soil and water protection, grazing, and road construction and maintenance have all been updated. Appendix D of the Biological Assessment lists all the standards and guidelines in the Forest Plan that aid in the protection and recovery of threatened and endangered species.

Any proposal to remove a bridge or other material, construct public accesses, alter river channels, build impoundment structures or gravel mining would require a site-specific environmental analysis. Part of that analysis would include identifying any suitable habitat for threatened and endangered species, including hellbenders, and describing any effects on the species, and designing mitigation measures to reduce or eliminate those effects.

The MTNF is currently cooperating with MDC to survey streams and rivers for both the eastern and Ozark hellbenders. Our water and soil standards and guidelines, as well as the aquatic habitat standards and guidelines provide resource protection and enhancement of the hellbender habitat.

PC# 519 - The Mark Twain National Forest should consider opportunities to reduce impacts to the Ozark Hellbender even if they are not the responsible agency.
A) Including adequate fencing of streams.
B) Including portable or fixed toilet facilities/rest stops along float routes.

PC#519 - The Mark Twain National Forest currently has two members on the Ozark Hellbender Working Group, along with a member on the Watershed Protection and Improvement Committee for the hellbender. As members of the committee, we have been active in identifying threats to the hellbender, as well as identifying actions to address these threats.

Theme 9.3 - Hine's emerald dragonfly

PC# 159 - The Mark Twain National Forest should maintain riparian structure and function.
A) To benefit Hine's emerald dragonfly and Tumbling creek cavesnail.

PC#159 – Changes have been made in the FEIS to reflect the addition of Conservation Approaches to contribute to the viability of Hine's emerald dragonfly and Tumbling Creek cavesnail. These conservation approaches are: (A) Maintain riparian structure and function; (B) Maintain free-flowing streams and rivers; and C) Minimize sedimentation from National Forest lands.

In addition, two new standards restricting vehicle and heavy equipment use in fens have been added to increase protection for Hine's emerald dragonfly habitat.

Theme 9.4 - Indiana and Gray bat

PC# 182 - The Mark Twain National Forest should assess the impact of pesticides and invasive species on bats.

PC#182 – The effects of pesticide use on the prey base for Indiana and gray bats have been addressed in the biological assessment. Changes have been made to the FEIS showing that Indiana bats may benefit from control of non-native invasive species.

Theme 9.5 - Virginia Sneezeweed

PC# 166 - The Mark Twain National Forest should conduct a biological assessment of federally listed species.
A) To include the Virginia sneezeweed.

PC#166 – The federally listed Virginia sneezeweed has been included in the Biological Assessment for the 2005 Forest Plan. In addition, the species are be addressed in the effects analysis of the FEIS.

Theme 9.6 - Protect TES and at risk species

PC# 99 - The Mark Twain National Forest should provide protection of rare, threatened, endangered, and at risk species.
A) Including frogs, bats, snakes, salamanders, and other groups of species that occur on the forest.
B) Including state-listed species.
C) By making it the highest priority in the plan.
D) Because it is required by the Endangered Species Act.
E) By including strong viability standards and mandatory monitoring.
F) Including providing large spaces for black bears and mountain lions to roam.
G) Including a refuge where forest interior birds can reproduce.
H) Including undisturbed watersheds for sensitive aquatic species.
I) With detailed and enforceable standards and guidelines developed for the protection of each listed species.
J) Including a comprehensive analysis of what size of forest patches will remain after implementation of the plan, and what species are currently occupying these areas.
K) By introducing fire into Bell Mountain Wilderness to sustain and enhance Mead's milkweed.

PC# 165 - The Mark Twain National Forest should comply with the Endangered Species Act.

PC# 99, PC# 165 – Goal 1.4 of the Forest Plan provides support for the recovery of federal and state listed species, protection of regionally listed species, and protection and

management of habitat of other species of concern. The MTNF conducted course filter/fine filter approach for analyzing species viability (SVE process) for the species at risk (SAR) that occur within or downstream of FS lands or could be impacted by our activities. Maintaining species viability was a goal of every Forest Plan Revision alternative that was developed. Currently, there are conservation assessments completed for over 1/3 of the MTNF's Regional Foresters Sensitive Species. These assessments were incorporated into the SVE process. Pages 3-129 through 3-160 in the FEIS discuss the effects of the alternatives on the SAR. All 'Terrestrial and Aquatic Habitat Management' standards and guidelines developed provide for the continued viability of SAR. Chapter 4 of the 2005 Forest Plan (Monitoring and Evaluation) list the monitoring items required

PC#99 D -The Mark Twain National Forest continues to work with US Fish and Wildlife Service (FWS) and Missouri Department of Conservation (MDC) regarding the conservation and protection of endangered and threatened species. Through the Endangered Species Act, section 7 consultation with FWS, we assist with species' conservation and recovery.

PC#99 F - The eastern cougar (*Puma concolor cougar*) is listed as federally endangered in the eastern U.S. from far eastern Illinois to the east coast. The Florida panther (*Puma concolor coryi*) is federally listed in Florida and all other free-living *Puma concolor* in Florida are federally threatened due to similarity in appearence. The mountain lion is Missouri state listed as endangered, yet not federally listed or listed by the Regional Forester as sensitive. Current state evidence shows that there is no wild, self-sustaining mountain lion population in Missouri. The Louisiana black bear (Ursus americanus luteolus) is federally threatened in its historic range of Louisiana, east Texas, and southern Mississippi. All other free-living Ursus americanus within this historic range are federally threatened due to similarity in appearance. The American black bear in Missouri is neither state or federally listed, or listed by the Regional Forester as sensitive in Missouri. However, Missouri does list the black bear as a species of conservation concern (S3). If the mountain lion (*Puma concolor*) or American black bear (*Ursus americanus*) were to be listed in Missouri under the Endangered Species Act, the Mark Twain NF would consult with Fish and Wildlife Service on species and habitat protection. Black bears are known to occur on MTNF, and the ecosystem management approach of the 2005 Forest Plan would provide large areas of suitable bear habitat. Mountain lions are not known to occur as a breeding population; however, the ecosystem management approach of the 2005 Forest Plan would provide large areas of suitable cougar habitat.

PC#99 K - At the Bell Mountain Mead's milkweed site, management is constrained by Wilderness legislation. Using prescribed fire requires permission from the Regional Forester (FSM 2324.04b(2)). See also Management Prescription 5.1, Vegetation Management, 2005 Forest Plan.

PC#99 J - Forest patch sizes will range from small isolated patches to larger late successional and old growth patches, as well as wilderness areas which are thousands of acres in size. The FEIS discusses species and large patches within the old growth discussion.

Theme 9.7 - Species-specific management plans

PC# 167 - The Mark Twain National Forest should develop species-specific management plans and directives for all species whose viability is at risk and monitor the effectiveness of those plans through collective population data.
A) Including early surveys of communities targeted for restoration.
B) Including analysis of effects of forest patch size.
C) To provide protection for wild birds.
D) Because roughly one third of all Whip-poor-wills on planet Earth come from the

Mark Twain National Forest-Ozark Region.
E) Including other birds having a significant portion of their total species population on the Mark Twain such as, the Field Sparrow, Kentucky Warbler, Blue-gray Gnatcatcher, Chuck-will's Widow, Eastern Wood-Pewee, Summer Tanager, Yellow-billed Cuckoo, Blue-winged Warbler, Louisiana Water Thrush, Worm-eating Warbler.
F) With an emphasis on old growth and aquatic habitats.

PC#167 – NFMA requires that plant and animal community diversity be maintained in the context of multiple use management of the National Forests. The statutory language contains numerous qualifying phrases. These phrases, and the scientific complexity involved, indicates that NFMA diversity is a subject requiring a high level of technical expertise. It is clear, however, from the plain language of the Act that diversity is to be addressed in the light of "overall multiple use objectives." 16 U.S.C. Sec. 1604(g)(3)(B). Thus the inherent flexibility embodied in NFMA does not require the Mark Twain National Forest to adopt an alternative which provides a likelihood of species viability that precludes any multiple use compromises. To do so would be contrary to the overall mandate of NFMA, 16 U.S.C. Sec. 1604(e), NFMA regulations likewise reflect that the providing for diversity of plant and animal communities must be accomplished in a manner consistent with the multiple use context of the land and resource management plan, see e.g. 36 CFR 29.27(a)(5)(a)(6); 219.265. NFMA does not require any specific procedure for conducting a viability assessment and analysis of potential effects. The Forest has carefully considered the request to produce species-specific management plans and concluded that such plans are neither required by law, nor necessary to protect Species At Risk (SAR).

The commenters do not take issue with the substantive protection provided to SARs, but rather are concerned with the methodology used to provide for viability. We have carefully considered the commenters' methodology preferences, abut have concluded that the method used to analyze and provide for NFMA diversity in the 2005 Forest Plan is appropriate.)The commenters' concerns may be rooted in disagreements by experts concerning how best to provide for biological diversity. See Overview of Forest Planning, http://www.fs.fed.us/emc/nfma at pages 23-31.) As noted above, providing for diversity is a highly technical subject that is continually changing as scientific information becomes available. The forest is not required to conduct a viability analysis for every species, as there is no such requirement in NFMA or its regulations. Common sense and agency expertise must be applied in assessing viability. NFMA does not require the determination of a minimum viability threshold or other numeric population estimate as a demonstration that the viability requirement has been met. There is no required procedure for conducting a viability assessment and analysis of effects of the alternatives, however, the process chosen must comply with the legal requirements in 36 CFR 219.19, 219.27(a).

The Mark Twain National Forest is on the leading edge of scientific developments with regard to NFMA diversity, and has taken into consideration recent decision by the USDA Under Secretary for Natural Resources which set forth "basic principles on viability that have emerged over the years." See Appeal Decisions for Arapaho and Roosevelt National Forests, Rio Grande National Forest, and Routt National Forest, http://www.fs.fed.us/emc. The Forest has considerable discretion regarding how to provide for viability, so long as relevant factors are not overlooked, no clear errors of judgment are made, a rationale is provided for using the approach taken, and the plain language requirements of the planning regulations are met. The planning record for the 2005 Forest Plan documents compliance with these factors. As noted in the Under Secretary's decisions,

> "There are thousands of species of wildlife on the national forests; trying to provide for diversity and viability on a species-by-species basis is virtually impossible. Instead, the

> scientific community has widely accepted the use of a coarse filter/fine filter process to address biodiversity issues…."

The Forest has developed the 2005 Forest Plan based on the best scientific information available and given consideration to other methodoliges advanced by various interests. Given the broad discretion allowed the Forest under NFMA and its regulations, we have considered the views submitted in comments and concluded that the coarse filter/fine filter approach of the Species Viability Evaluation and programmatic direction included in the 2005 Forest Plna comply with all legal requirements.

Mark Twain NF used a Species Viability Evaluation (SVE) process to determine which species may have viability concerns on Mark Twain NF lands, and whether or not changes were needed to the 1986 Forest Plan in order to maintain ecological conditions that provide well-distributed habitat across the landscape that supports viability of all species. This included current status of species populations and habitats, and effects to species and habitats. Page 3-129 through 3-160 of the FEIS address species at risk (SAR) and effects from planned activities.

To evaluate potential ecological sustainability effects on SAR, the following factors were considered: threats and risks to each SAR, and whether or not those occur on Mark Twain NF lands; viability outcomes for each SAR; which species had significant viability concerns on Mark Twain NF, as well as those species that do not have significant viability concerns on Mark Twain NF; which SAR are addressed by each Conservation Approach; if Conservation Approaches are met by each alternative; habitat and population objectives for TES, RFSS, and MIS; and how well habitat and population objectives were met by each alternative.

The ecosystem and species level directions comprise the Mark Twain NF's Conservation Approaches to contribute to the viability of all species. Conservation Approaches are:

> Maintain riparian structure and function; maintain free-flowing streams and rivers; minimize sedimentation from National Forest lands; maintain hydrologic integrity of wetland and lowland forest natural communities; maintain forested landscapes (with all successional stages present); restore prescribed fire regimes and manage fire-adapted natural communities; protect the structural and biological integrity of caves and reduce human disturbance to cave systems; protect and manage known locations of species at risk; retain den trees and snags, downed woody material (particularly large size); and control non-native invasive species.

All 'Terrestrial and Aquatic Habitat Management' standards and guidelines developed provide for the continued viability of SAR. Specific standards and guidelines for elements of individual species' needs that are not fully addressed at the ecosystem level were developed.

Chapter 4 of the Revised Forest Plan (Monitoring and Evaluation) lists the monitoring items required.

Theme 9.8 - Threatened, Endangered and Sensitive Species (TES) Standards and Guidelines

PC# 325 - The Mark Twain National Forest should change standards and guidelines regarding threatened, endangered, and sensitive species.
A) To address species at risk.
B) Including an evaluation of each species with viability concerns as it relates to timber harvest and other activities.
C) To comply with the National Environmental Protection Act.
D) Including grazing impacts and comparison of native grazers to cows.
E) Including impacts of timber sales.

F) Including clarification about climate and fire impacts.
G) Including clarification about biological threats to oaks.
H) Including active and passive management.
I) Including consideration of protection of mountain lions.
J) By correcting an error regarding Coranado on page 3-49.
K) By changing a standard requiring top priority be given to the conservation and recovery of listed species.
L) By including information cited in the DEIS such as Nelson 2004.

PC# 325 A, B - Mark Twain NF used a Species Viability Evaluation (SVE) process to determine which species may have viability concerns on Mark Twain NF lands, and whether or not changes were needed to the 1986 Forest Plan in order to maintain ecological conditions that provide well-distributed habitat across the landscape that supports viability of all species. This included current status of species populations and habitats, and effects to species and habitats. Pages 3-129 through 3-160 of the FEIS address species at risk and effects from planned activities.

PC# 325 C - The Forest Plan revision, including standards and guidelines in the 2005 Forest Plan, were created using the NEPA process and were developed in coordination with the USFWS.

PC# 325 D - Range of Natural Variability for Native Grazers are discussed on pages 3-68, 3-69, 3-70 and 3-269 of the FEIS and under Animal Disturbances in Appendix D. See also responses to PC# 238, 300 and 344 (Theme 15.1). Page 88 of tne FEIS references use of glades as rangeland in Nelson (2005). This reference also provides more in-depth discussion regarding the differences between native grazers and domestic livestock (see pages 51-54 of Nelson 2005).

PC# 325 E - Pages 3-51 through 3-59 discuss the effects of timber management by manipulating vegetation structure in terms of age class and spatial patterns to simulate range of natural variability (RNV) and shifting species composition to the RNV.

PC#325 I– Current state evidence shows that there is no wild, self-sustaining mountain lion population in Missouri. If the mountain lion (*Puma concolor*) were to be listed under the Endangered Species Act, the Mark Twain NF would consult with Fish and Wildlife Service on species and habitat protection. See Response to PC#99F (Theme 9.6).

PC# 325 K - Goal 1.4 of the Forest Plan clearly states that the Mark Twain NF supports the recovery of federal and state listed species, protection of regionally listed species, and protection and management of habitat of other species of concern.

PC# 325 L - Nelson 2004 should be Nelson 2005. This has been corrected in the FEIS. The book was peer reviewed by numerous members of the Missouri Natural Areas Committee, as well as numerous other professionals and state and federal agencies, including the Forest Service.

PC# 515 - The Mark Twain National Forest should verify the scientific name of the three mussel species listed on pages 3-146 and 3-150.
A) Because the text currently reads "L. leptodon" for all three of the described species.

PC#515 -The three species discussed in the FEIS are all type of Unionid mussel species. The names referenced by the commentor are all citations from the L. leptodon Recovery Plan, and describe general effects to all Unionid mussel species. While three different mussels were evaluated, the citation to the L. leptodon Recovery Plan is correct, as that information was reviewed for all three species.

General Theme 10 - Inventory and Monitoring

Theme 10.1 - Inventory and Monitoring

PC# 338 - The Mark Twain National Forest should review standards and guidelines regarding Monitoring and Evaluation.
A) Because monitoring and evaluation requirements will provide a basis for a periodic determination of the effects of management practices.
B) Including Management Indicator Species.
C) Including the impact of timber harvesting on forest user's enjoyment of the forest.
D) Including detection of non-native invasive species.
E) Including impacts of grazing.
F) Including public opinion of how their forest is being managed.
G) Including how much money is lost cutting down the forest.
H) Including consideration of data quality requests.
I) Including procedures for managing data, reporting results, and making it available to the public.
J) Including mandatory and frequent monitoring requirements to ensure the plan will not result in damage to the forest.
K) For protection of species such as frogs, bats, snakes, and salamanders.
L) Including a standard to conduct plant and animal inventories/surveys.
M) Including monitoring the effects of timber harvesting.

PC#338 -Chapter 4 of the Final EIS contains direction for Monitoring and Evaluation. A wide range of potential monitoring items were carefully considered by the ID team. The final list, included in Chapter 4, were items selected to comply with laws and regulations, to address public issues, or provide the Forest with information that will be useful in adapting management to changed conditions. These items are not included as standards and guidelines, since monitoring and evaluation needs change. Managers need the flexibility to adjust monitoring and evaluation strategies and techniques without having to amend the Forest Plan to do so.

One of the monitoring questions regards habitat being provided for viable populations of native and desired non-native species. The species mentioned by the commenter would be covered by this item.

The commenter is correct that the 2005 Planning Rule provides additional direction to the Forest Service on monitoring of Management Indicator Species (MIS). The Mark Twain National Forest has carefully considered this direction and has determined that the most effective method of monitoring MIS would be to answer the question “To what extent are forest management activities providing habitat for Management Indicator Species?”, and the MIS monitoring item on page 4-10 of the 2005 Forest Plan has been revised to reflect this change.

Populations of all the selected MIS (and indeed most native Missouri species) occur on other ownerships as well as MTNF. It is often very difficult to determine the cause and/or significance of population fluctuations; and is almost impossible given the fragmented ownership of MTNF (pages 3-77 through 3-80 of FEIS) to determine what part of a population change is due to activities on other ownerships as opposed to those on MTNF. It is also almost impossible to determine population trends specifically for National Forest lands in the east due to fragmented ownership patterns. The direction contained in the 2005 Planning Rule is intended to allow managers the flexibility to select monitoring strategies, tools, and techniques that can begin to answer the question of how management of National Forest lands affects these species.

Based upon the best available scientific information, the revised forest plan adopts an ecosystem approach as the most efficient and effective way to manage for the broadest range of species with the limited resources available for the task. This approach is fully compliant with the requirements of the NFMA regulations.

The Mark Twain National Forest will work with our partners in North Central Forest Research Station, U.S. Fish and Wildlife Service, and Missouri Department of Conservation to develop a monitoring strategy for MIS that looks at the relationship between habitats provided on MTNF and population trends of MIS. It may include either population monitoring or habitat monitoring or a combination of the two.

General Theme 11 - Fire Management

Theme 11.1 - Rx Burns

PC# 61 - The Mark Twain National Forest should implement prescribed burns.
A) To control or attain favored habitats.
B) In the Hercules Glades Wilderness near Forsythe.
C) On a reduced number of acres to support the Healthy Forest Initiative.
D) To maintain or enhance the Mead's milkweed population in the Bell Mountain Wilderness.
E) To create more natural disturbance and succession processes, when combined with old growth designations.
F) To restore glade and savanna habitats.
G) With consideration of mosaic burns which are most beneficial to numerous species, including amphibians.
H) To both reduce wildfire hazards and sustain the synecological integrity of the fire-adapted and fire-dependent terrestrial communities which comprise the vast majority of Mark Twain National Forest.

PC#61A - Thank you for your support of the direction the Forest is proposing. The Forest is dedicated to respond to the President's Healthy Forest Initiative by restoring fire adapted ecosystems.

PC#61 B & F - Fire will always be a part of the Glade natural community. But without frequent fire, redcedar will invade the glade ecosystem and reduce species diversity. If habitat conversion from open-lands to redcedar thickets were allowed to go unchecked, the lack of fuels in the understory would lengthen fire frequency. Because the redcedar tree is an efficient competitor for sunlight and water, it restricts herbaceous vegetation underneath it. With limited ground vegetation, fuels are not sufficient to carry or transport a fire to the tree crown in a normal year. During rainy periods, the branches and leaves of mature cedar have high water content, and consequently it takes a significant amount of heat from the understory to ignite a redcedar crown. Under droughty conditions, the redcedar's resistance to fire diminishes, taking less heat to ignite and maintain a crown fire. An intense stand replacement fire may lead to serious habitat damage, accelerated erosion and private property damage. Once burned off, glade vegetation could establish itself depending on seed bank conditions. Unfortunately, redcedar seedlings would probably gain a foothold on the glade before full grass/forb recovery had a chance. Consequently, within 40 years, a full redcedar stand would once again dominate the site.

Fire not only controls redcedar, it stimulates grass/forb vegetation. The periodic removal of dead leaf material is essential to maintaining a vigorous herbaceous ground cover and to the maintenance of open glade ecosystems. Historically, dead leaf material was removed by large herbivores, (buffalo and elk,) and fire.

In savannas, redcedars readily invade the understory. Redcedars are long-lived species, up to 500 years, very competitive, and will suppress oak seedlings and outlive any existing pine and oak trees. In 100 or 200 years, redcedar will dominate the vegetative community. Without fire, redcedar encroachment occurs rapidly and results in the loss of these fire-dependent communities decreasing overall community diversity.

Forest Service researchers determined that humans are an integral part of today's ecosystem, because humans influence and are influenced by their environment (Kaufmann et.al. p.1). This is a paradox, because the extensive burning done by the Indians is what developed and maintained glade ecosystems and gave the area its unique picturesque quality. Yet, the absence of fire threatens this beauty and allows fuels to build up to dangerous levels. In 1985 Forest Service Chief Max Peterson approved prescribed burning in the Hercules Glades Wilderness. It was recognized that both natural and human-caused fire played an important role in the development of the "glades." The Chief determined that recent development adjacent to the boundary has interfered with the natural role of fire by preventing natural-caused fires from reaching the Wilderness. He reasoned that returning fire to the wilderness would help it evolve toward a more "natural condition." "Fuels and vegetative conditions that are there now, probably would not be there if humans had not stopped fire." Four burns were approved by the 1986 Forest Plan, (LRMP, Appendix E-3), three were accomplished: Pole Creek in 1987, 818 acres; Pees Creek in 1989, 1002 acres; and Coy Bald in 1991, 126 acres. The 2005 Forest Plan and FEIS does not change direction from 1986 Forest Plan direction in this regard.

PC#61C - While it may seem as though the Forest is aggressively increasing its prescribed fire program the fact remains acres treated per year for ecosystem restoration and hazardous fuels reduction will be less than .06% of the total acres.

PC#61 D - Neither the 1986 or the 2005 Forest Plan restricts management activities for specific plant communities within Wilderness boundaries. Any activities in designated Wilderness areas must comply with Wilderness legislation, and requires permission from the Regional Forester (FSM 2324.04b(2)).

PC# 188 - The Mark Twain National Forest should reconsider the use and management of fire.
A) Because of impacts to private property surround forest lands.
B) For fuels reduction.
C) Because there is discrepancy in existing literature regarding the effects of prescribed fire.
D) Because they open themselves to criticism with their contradictory attitudes toward fire.
E) Because there is insufficient information in the plan to assess whether Objective 2.2A, ensuring that 20 percent of prescribed fire coverage occurs between May and September, is appropriate.
F) By clarifying contradictory positions and justifications for application during restoration.
G) To recognize concerns about fire at the landscape level and that stand prescriptions with potential negative impacts on forest regeneration and production may create safety and liability issues.
H) Because of impacts on air quality.
I) Because of impacts on Ozark soils.
J) Because of society's expectation for forest products and economic sectors not to be degraded.

PC#188 A - Concerns noted in these comments will be covered in site specific analyses for prescribed fires.

PC#188 B - Recent literature supports that the population in Missouri will increase in the future. "Forests on the Edge" General Technical Report PNW-GTR-636 reports that growth around the Mark Twain will be moderate. More homes will be built near the forest; more people will be traveling in and around the forest. The forest would be remiss to ignore its neighbors and not provide appropriate protection from wildfire. The risk assessment, Appendix G of the FEIS, identifies those areas at risk, and focuses efforts to protect those areas of risk from wildfire, through fuels reduction projects.

PC#188 C & F - The EIS references to fire are intended to disclose effects of each alternative toward accomplishment of various goals and objectives in response to the need for change. Those changes analyze fire effects in context of ecosystem sustainability, reduction of hazardous fuels, restoring fire-adapted natural communities and comparison of other effects across alternatives. The planning team is unable to reconsider use and management of fire because the commenter did not provide specific information regarding literature discrepancies. However, we feel that the EIS adequately considered all aspects of fire effects (regarding effects on soils, water quality, wildlife, etc) from which to make planning revision decisions. Specific fire effects (as well as other management activity effects) will be disclosed during project analysis.

PC#188 D - While it may appear that there is some contradiction in our messages about fire, we feel there is not. As the prevention message has expressed since the early 1940's, uncontrolled wildfire can be bad. It kills trees, kills wildlife, and damages the soil. But, wildfire can also be beneficial. This is evidenced by federal policy changes that allow natural fires to burn as long as they are benefiting the resource. To benefit the resource a wildfire will usually burn at a low intensity. The key is intensity. There obviously is a big difference between fires that burn with 16 foot flame lengths as opposed to fires that burn with a 6 inch flame length. Fires burning with a low intensity can benefit the resource by removing fuels, and rapidly converting litter into beneficial nutrients readily available forbs and grasses. These low intensity fires generally do not damage trees, and stimulate grass and forb growth. In many cases species of forbs and grasses appear that were not apparent pre-burn. The goal of prescribed fire is to mimic these low intensity wildfires. Fires, either natural or management ignited, are allowed to burn to benefit the resource (wildlife, timber, ecosystems, etc.) There are cases where high intensity management ignited fires are used to achieve management objectives. These objectives may include site preparation for tree planting, pile burning, and opening development.

The removal of timber creates more fuel for a fire to consume and generally increases the intensity. Trees removed to reduce fuel will actually increase the fuel loading in the same manner as a timber sale. However, fuel reduction treatments are accomplished in two stages, the first stage being the removal of trees, followed up by the second stage, removing the fuels generated by harvest activities. This follow-up treatment can be accomplished by fire, or removed/ chopped mechanically.

PC#188 E - Objective 2.2A, ensuring that 20 percent of prescribed fire coverage occurs between May and September, was derived from an extrapolation of the initial treatments necessary for ecosystem restoration in 1.1 and 1.2 management areas. The greatest probability of mortality will occur to a tree when the sap is flowing during the growing season, May through September. For this reason, prescribed burns are suspended for the most part from mid to late April. Historically, most of the lightning caused fires on the Forest occur during the thunderstorm season ranging generally from March through September. To replicate the effects caused by historic lightning, the Forest wants to accomplish a small percentage of its burns in this period. Generally, these summer fires burn with a low intensity, due to high humidity and high fuel moisture, and a low rate of spread. Normally,

they do not consume more than 50% of the litter layer. They burn in more of a mosaic pattern than do spring and fall fires. This is due for the most part to high live fuel moisture values. High mortality to trees one inch and less in diameter is characteristic of summer fires. One major consideration when implementing summer fires is air quality. These burns can only be accomplished when the humidity is low and there is sufficient transport height and wind speed for adequate smoke dispersion. The FEIS has been amended to clarify the use of summer-growing season fires primarily as a restoration tool, especially for grass or grass/forb fuels in open woodlands, savannas, prairies and glades as a means of reducing woody species cover. However, other evidence does exist for the occasional occurrence of summer growing season lightning-caused fires, which the MTNF wishes to emulate. The MTNF recognizes that growing season fires do not occur in the same given point or area of the landscape on a repeated growing season basis. Also, adaptive management implies that Forest staff will evaluate and monitor management action results, then adjust management frequencies in lieu of more rigid applications of one fire frequency interval.

PC#188 G - Protection of specific stands of timber will be accomplished during site-specific analysis.

PC#188 H - Please refer to PC#513 (Theme 12.1).

PC#188I – Pages 3-259 through 3-261 in the FEIS specifically address the impacts of fire, including prescribed fires on soils in the Mark Twain National Forest. While hot burning wildfires, which are rare in the Ozarks based on fuel loading and fuel types, could in rare cases result in the loss of some soil organic matter, the cool prescribed fires that are accomplished within prescriptions can free up nutrients that were previously tied up in unburned material and make them available for uptake by plants and incorporate them in the soils. Additionally, nitrogen fixation may be enhanced, and soil nitrogen concentrations tend to increase. See also response to PC#391J (Theme 11.1)

PC#188 J - An estimated 68,800 acres per year may be treated with prescribed fire over the next decade (see Table 25, Chapter 3-196 of the FEIS). It will take several years of implementation strategy to adjust and move from 18,000 acres to 60,000 acres per year. The acreage increase across the Forest is relatively low when compared to the total Forest acreage and suitable timber base. While we know that there may be a four-fold increase in the amount of annual prescribed burns, this actually represents an average increase from the current 0.7% (10,000 acres) to 4.5% (68,800 acres) per year, which will include many re-treated acres.

Wildfires can cause substantially greater impacts to timber resources than prescribed burns; thus, prescribed burns are intended to reduce fuels to the extent that any future wildfire would have less effect on damaging timber resources. There is an assumption that all prescribed fire will damage commercial timber. This is not the case; there must be a prescription in place prior to burning that will allow fire with minimal damage to existing timber. To achieve desired conditions in meeting timber, wildlife, hazardous fuels reduction and biodiversity objectives, we of course expect some negative effects to timber resources (as in the case of red oak groups). Many of the treated acres will occur on lands unsuitable for timber production (glades, rocky open woodlands, steep slopes, pastures, natural areas). Prescribed burning can be beneficial for timber management purposes, especially for site preparation (increasing shortleaf pine, white oak and post oak) and thinning of otherwise young overstocked stands. Research continues to substantiate that the 6 million acres of shortleaf pine once occupying the southern Ozarks was primarily the result of historical fires, and that restoring portions of original pine communities must include fire to restore them. Those timber resources impacted by prescribed burning will likely still remain far below any threshold (available ASQ, local supplies, etc) that would affect the local timber industry. The

Mark Twain NF has the ability to monitor any adverse economic impacts during the plan period. Since most communities surrounding the Mark Twain National Forest do not rely heavily on timber production from federal lands (page 3-326 of the FEIS), the impact of wildland fire burning suitable timber stands would be minimal. This lack of dependence is readily apparent due to the widely distributed nature of approved projects across the entire Forest. Secondly, hazardous fuels projects are focused, using the risk assessment, to protect certain values whether structures or TandE species.

PC# 391 - The Mark Twain National Forest should review management activities regarding prescribed burning
A) Instead of clear-cutting for restoration.
B) Including providing education regarding the importance of fire in creating and maintaining native plant communities to allay fears that the public may have regarding the value of prescribed fire.
C) Because communities should be cleared back 200 yards, not miles away.
D) Including prohibiting fire within 100 feet of sinkholes along with timber management activities.
E) Because the number one cause of fire is arson.
F) Because currently there is no discussion regarding how individual sites and sites with growing young timber may be managed.
G) Including developing science for the proper fire regime for each of the terrestrial natural communities where fire is appropriate.
H) Including basing fire prescription on eastern fire models, not western data.
I) Because fuel reduction is important in areas at risk for wildfires.
J) Including disclosing the effects of fire management on insects.
K) Including a smaller pilot area with a lengthy evaluation.

PC#391 A - While fire is a very important tool in ecosystem management, harvest activities are also important. Thinning can reduce the crown cover, allowing more light to the ground and encouraging the growth of grasses and forbs. It should be noted that the regeneration cuts referenced in Table E-3 include uneven-age management harvests as well as even-age harvests.

C391 B - Please reference Appendix D of the EIS. The Department of Conservation, Department of Natural Resources, National Park Service, Forest Service, Fish and Wildlife Service, and the Nature Conservancy are all faced with the need for appropriate public education and information as their prescribed fire programs expand to meet ecosystem restoration needs. We have done a good job of making the public aware of the dangers of wildfire through our prevention programs. It may appear that we are sending a mixed message concerning prescribed fire and wildfire. We are not; there is no conflict between Smokey Bear and prescribed fire. We as resource managers must get this message to the public.

PC#391C & I- The commenter mentions a "fire prescription plan." We assume the reference is to the draft fire risk assessment documented in Appendix G of the EIS. One of the values in the risk assessment is “Potential Ignition Proximity to Interface”. There, High risk is defined by less than a quarter of a mile; Medium is defined as a quarter mile to 1 mile; and Low is defined as greater than 1 mile. The risk assessment is a guide to determine where treatments should be attempted, as well as a guide to determine the type of suppression action that should be taken. Wildfires that threaten homes will remain a high priority and receive aggressive fire suppression. Treatments to reduce the risk of wildfires to communities will also use the risk assessment to determine priorities. Simply stated: communities that have more houses per acre and are in an area where there is a history of wildfires will receive a higher priority than a single dwelling where there is no history of wildfires. Initial fire

prevention efforts of each owner's property will always remain with the landowner. "Living with Wildfire," a publication distributed by the Department of Conservation and the Missouri State Fire Marshall lends excellent recommendations to land owners to protect private homes and out buildings from wildfire.

PC#391 D - Reference the 2005 Forest Plan pages 2-16, 2-17, 2-19 and 2-31. The 2005 Forest Plan standards and guidelines prohibit firelines and skid trails from being placed within 100 feet of sinkholes.

PC#391 E - Natural fires are not included in Table 30 page 207 of the Draft EIS; however, there is discussion dedicated to natural fire (Wildland Fire Use) on page 169 under the heading of Wildland Fire Use. Lightning ignited fires, the Mark Twain's only source of natural fire, accounted for 1.4% of the fires occurring from 1984 to 2003. Arson fires and the direct effects roads have on arson fires are discussed on pages 3-206 and 3-207 of the FEIS. While there is very little information available on fuel loading in the Missouri Ozarks, there is a study that indicates the rate in which a percent of equilibrium in 1 and 10 hour fuels is reached. Guyette (1999) reported that 50 percent of equilibrium is reached in 2.5 years and 75 percent of equilibrium is reached in five years. This research would suggest a 25% build-up in total fuel loading each year after five years. Keep in mind that this is in a forest that has no disturbance such as wind, insects, or disease. The Mark Twain is a forest with a history of disturbance. From the 1980's to the current date, oak decline has killed thousands of acres of red, black, and scarlet oak. Tornados and other wind events have laid many of acres of timber to the forest floor. In the recent past, the red oak borer has devastated stands of timber on the Mark Twain National Forest. Each dying tree adds to the fuel loading, first with dead limbs and branches, and then with the entire bole of the tree. One study on the time it takes a tree to decompose is USDA Agriculture Handbook No. 553 (1979). That study (accomplished in the west,) indicated that it takes about the same amount of time for a tree to decompose as it does for it to grow. Granted, we are not in an arid climate and our species are different. But in the Ozarks an 80-year-old tree would be relatively solid after 10 years of weathering. Generally, in an unmanaged forest fuels will tend to accumulate.

PC#391 F - Protection of specific stands of timber will be accomplished during site specific analysis.

PC#391 G - Please reference page 3-197 of the FEIS. The enhancement of Fire Regime Condition Classes (FRCC) is currently under development nationally and in Missouri. Nationally, a model (Landfire Rapid Assessment) is under construction that will establish FRCC. Specialists of the Mark Twain have been involved in the model development and have insured that terrestrial natural communities specific to the Mark Twain are well represented. Fire managers, fuels specialists and ecologists on the Mark Twain have fully engaged in the development of FRCC for the past several years. Because FRCC is a measure of the departure of current vegetation in relation to historic vegetation, Dr. Jim Harlen (University of Missouri) was placed under contract to develop a historic vegetation layer based on GLO notes. Dr. Dave Cleland (North Central Research Station) has been working with the historic layer developed by Harlan and the current vegetation from forest inventory records to develop FRCC for the Mark Twain. Dr. David Diamond of the Missouri Resources Partnership (MORAP) in Columbia has been working with Harlan and Cleland to develop and refine a potential natural vegetation (PNVG) model for historical FRCC. Also, Appendix D of the FEIS indicates that "Determining fire effects and regimes for all the various permutations of landscapes across the Forest will be evaluated at the local, project level Plan implementation." The Ecosystem Management Implementation Guide also will provide direction in determining fire regimes".

PC#391 H - See response to G above. Additionally, fire prescriptions are developed after examining fire research, monitoring and applied management resulting from over 30 years of prescribed burn experience by federal, state and private non-profit conservation organizations in Missouri. These results are published in many references and presented at numerous fire and oak ecology symposia.

PC#391 J - This is a programmatic, not site-specific document, and a different level of detail is appropriate. The supporting narrative in the FEIS also provides a sufficient level of detail for the deciding officer to make a rational decision. The FEIS addresses potential effects at a programmatic level and addresses effects in enough detail for the deciding official to be able to make a rational choice between alternatives. Alternative comparisons are found throughout Chapter 3 of the FEIS, and in particular, are summarized on pages 2-19 through 2-40. The commenter's requests for additional analysis have been considered by the ID team. Many of the requests are outside the scope of Plan decisions, or are more appropriately addressed at the site-specific project level. The ID team supports the analysis as completed and has determined that the additional information requested is not necessary for the deciding officer to make a reasoned choice between alternatives.

PC#391 K - We agree that the Guyette studies continue providing valuable information and evidence regarding the significance of fire and its application to resource management. In response to establishment of pilot areas, in reality the spatial distribution and relative size of current prescribed burns pale in comparison to the amount of Missouri lands subject to fire suppression and extreme departures from historic fire regimes. This has resulted in loss and degradation of fire-adapted natural communities and habitats for plant and animal species adapted to them as documented in various ecological assessments (see DEIS, Chapter 3-61). The relative size of current prescribed burn units readily mimic prescribed burns conducted the past 25 years by the Missouri Department of Conservation, Missouri Department of Natural Resources, The Nature Conservancy, National Park Service and U.S. Fish and Wildlife Service, among others. These entities have and continue to monitor/evaluate effects from which the MTNF relies on during project analysis. Additionally, Chapter 4 of the draft Revised Forest Plan provides for monitoring and evaluation during plan implementation, and adaptive management adjustments based on monitoring results.

Please reference PC#513 (Theme 12.1).

Theme 11.2 - Fire management Standards and Guidelines

PC# 302 - The Mark Twain National Forest should change goals, standards and guidelines regarding Fire and Prescribed Fire Management.
A) Including prescribed burns.
B) Including guidelines for firefighting barriers and firelines as standards.
C) Including guidelines for erosion control measures as standards.
D) Including guidelines suppression activities as standards and clarification of "appropriate suppression response".
E) Including protection for the Indiana Bat.
F) To clarify the definition of "Forest wide forest risk assessment".
G) Including prohibition of prescribed burns on high Air Quality Index days.
H) By expanding Goal 2.11 to include recognition of need for, and provision for application of prescribed fire to wilderness areas in addition to the Hercules Glades Wilderness area that contain globally significant biodiversity features.
I) Including focusing on treating the areas near structures not cutting down the forest when reducing fire risk to communities.
J) Including providing scientific basis for burning from May through September.
K) Because projected acreage for fuels reduction is too high.
L) Because it is unclear whether or not the planned actions will result in appreciable

progress without specific objectives and rigorous on the ground assessment of pre-burn conditions and post treatment results.
M) Including a standard to implement a program that requires a plant and animal inventory before and after prescribed fire.

PC#302 A, B, C, and M - All standards and guidelines were developed by resource specialists familiar with prescribed fire management and impacts of fire on the Mark Twain National Forest. These specialists are also very knowledgeable in their particular field of expertise including hydrology, ecology, forestry, and wildlife biology. Determining the appropriate level of measure (standard or guideline) was done using the interdisciplinary team of specialists' knowledge and experience as a foundation. In some cases, scientific literature helped the specialists develop the appropriate level of measure as well as the numbers, dates, or other quantifiable criteria specific to standards or guidelines. The level of measure developed is appropriate for ensuring proper management on the National Forest. The specific distances and criteria used in the development of all standards and guidelines are scientifically sound.

PC#302 D - Please reference the Forest Risk Assessment, Appendix G of the FEIS. Appropriate suppression/management response is discussed on pages 18 - 25.

PC#302 E - See PC#168 (Theme 9.1) for discussion of protection for Indiana bat.

PC#302 F - The Forest Risk Assessment is Appendix G of the FEIS. The Forest Risk Assessment is a spatial display of the several factors that determine the relative risks from wildfires in various areas. The Forest Risk Assessment (FRA) can be used by Forest managers to
determine where fuels reduction projects should be initiated, identify projects needed to prevent fire from entering high risk areas, preposition suppression resources for initial attack, determine where modified suppression responses may be best utilized, locate areas best suited for wildland fire use, and identify private landowners and communities for participation in Firewise or other prevention programs.

PC#302 G - Please reference "Smoke Management" page 2-19 of the 2005 Forest Plan.

PC#301 H - See PC#61D (Theme 11.1)

PC#302 I - Please reference the Forest Risk Assessment, Appendix G of the FEIS. One benefit of the risk assessment is to give managers a visual guide to plan projects based on risk to communities. If an area is not determined to be in high or moderate risk then the project should not be considered for treatment. If it is determined that a dense canopy is a contributing factor in the assessment, usually redcedar or pine, then the canopy may need to be reduced. In many cases, the only treatment to reduce fuels will be applications of prescribed fire.

PC#302 J - It has been recognized that the greatest probability of mortality will occur to a tree when the sap is flowing. This occurs in the growing season May through September. For this reason prescribed burns are suspended for the most part from mid to late April. Historically, most of the lightning caused fires on the Forest occur during the thunderstorm season ranging generally from March through September. To replicate the effects caused by historic lightening the Forest wants to accomplish a small percentage of its burns in this period. Generally, these summer fires burn with a low intensity, and a low rate of spread. Normally, they do not consume more than 50% of the litter layer. They burn in more of a mosaic pattern than do spring and fall fires. This is due for the most part to high live fuel moisture values. High mortality to trees less than one inch diameter and less, is characteristic of summer fires. One major consideration when implementing summer fires is air quality.

These burns can only be accomplished when the humidity is low and there is sufficient transport height and wind speed for adequate smoke dispersion.

PC#302 K - One of the outputs of the Forest Risk Assessment, Appendix G of the FEIS, is total acres in high, medium, and low risk. There are 558,000 acres contained in medium risk, and 35,900 in high risk, totaling 593,900 acres in high and medium risk. This figure represents about 40% of the forest that is at risk for one reason or another. The Forest wants is proposing to treat around 60,000 acres a year to reduce risk due to hazardous fuels conditions. This represents about 4% of the forest to be treated yearly. While 60,000 acres will be 6 times more than the current program, it still only represents a small percentage of the acres that could be treated.

PC#302 L - Specific effects and assessment of pre-burn treatments and post treatment results are more appropriately made during site-specific analyses and follow-up monitoring.

PC#302 M - Conducting extensive plant and animal inventories would consume a disproportionate amount of funding, often resulting in inconclusiveness for adjusting current management activities. Consequently, the Mark Twain National Forest is proposing the ecosystem-based, coarse-filter management approach to address species viability at the ecosystem and landscape scale. The approach will place greater emphasis on the relationship between landscape pattern and processes, natural community measures including species richness and focusing ecosystem restoration strategically where restoration of significant ecosystems is based on conservation assessments and comprehensive wildlife strategies. By not requiring such a standard, respective ranger districts can assess and determine whether plant and/or animal inventories are essential to the project analysis.

Theme 11.3 - Effects of Fire Management

PC# 351 - The Mark Twain National Forest should consider the effects periodic burns and the effects on the loss of vegetative material to the organic layer of the soil.
A) To better describe lands at greatest risk of ecological collapse.
B) To clarify conflicts of hazardous fuel reduction, leaving woody material, and restoration.

PC#351 - Please refer to the response to PC# 188. The Forest Plan gives broad general direction. Site-specific concerns such as conflicts between leaving vegetative material or removing it will be considered in project level, site specific NEPA analysis.

Theme 11.4 - Escaped fires

PC# 113 - The Mark Twain National Forest should ensure that fire on federal land does not spread to private property and if it does, full and immediate restitution should be made to the property owner.

PC#113 - Federal land mangers take great efforts, some mandated by law, to avoid the escape of fires used by the Forest for resource management. Prescribed burning must be preceded by site-specific NEPA compliance, including public involvement. The 2005 Forest Plan is a programmatic framework for future decision-making and as such does not authorize, fund, or carry out any ground-disturbing activities, including prescribed burns.

In addition, a prescribed burn plan is written to guide and direct how particular project burns will be conducted at the site-specific level. The site-specific prescribed burn plan specifies the exact range of weather conditions that must exist before ignition can be initiated, and the numbers of firefighters that must be available to safely execute the burn. The prescribed burn plan also determines a contingency force of firefighting equipment that must be available to react to the prescribed burn should it become uncontrolled. The prescribed burn plan is

created and reviewed by fire experts and resource specialists to insure the specific burn parameter will achieve the desired results while minimizing the risks of an escape or uncontrolled burn. The Federal Torts Claims Act addresses claims for monetary damages against the United States for injury or loss of property. This liability issue is not properly considered within the scope of a NFMA land and resource management plan.

General Theme 12 - Air Quality

Theme 12.1 - Effects on Air Quality

PC# 339 - The Mark Twain National Forest should address the impacts of mechanized lawn care on air quality.

PC#339 -Please refer to page 3-339 of the FEIS under Unavoidable adverse impacts….Air Quality.

PC# 513 - The Mark Twain National Forest should consider federal regulations, policies, guidance, and Executive Orders when managing prescribed fire.
A) By utilizing the assistance of the EPA for evaluating the effects of individual prescribed fires while the Statewide Smoke Management Plan is being developed.
B) By providing detailed scrutiny through environmental assessments for individual prescribed burns .
C) To outline the steps the U.S. Forest Service's program will take for specific prescribed burns to reduce emissions, increase plume dispersion, coordinate (within the forest service as well as with other authorities), and communicate with the public to minimize the negative impacts of the prescribed burning on air quality.
D) By developing a plan to address the adverse effects of prescribed burning.
E) Including an adequate description of the level of analysis that will be undertaken to ensure the protection of human health and the environment with the implementation of the preferred alternative.
F) Including effective and timely communication to allow individuals to take any steps necessary to adjust their behavior and resultant exposure to protect their personal health.
G) By disseminating information regarding the potential impacts on air quality and as a result, human health and the environment.
H) By providing mitigation methods that could be followed by sensitive individuals.
I) Including an outline the plans for monitoring the impacts of burns, potential contingency measures and a decision hierarchy for adjusting plans in response to monitoring and actual burn conditions.
J) Including how the U.S. Forest communicates internally and with other officials to coordinate specific bums within the Forest and in other National Forests (particularly upwind in Arkansas and Oklahoma) to minimize the impact of prescribed burning on a more regional basis.
K) Including control strategies such as limiting the dates of burning to days outside the ozone window and limiting the volume of burning on the same or consecutive days on a regional basis, etc.
L) Including consideration of air quality and smoke effects on environmental justice and sensitive populations during burn planning.
M) Including specifics on how, where, and to what extent prescribed fire may be used.
N) Including working with the Environmental Protection Agency regarding mitigation for prescribed burns.

PC#513A - The Mark Twain appreciates EPA's offer and looks forward to working with EPA to evaluate the smoke impacts of individual prescribed fires.

PC#513B - The Mark Twain, like the EPA, is concerned with the effects increased burning will have on the air quality of areas such as St. Louis, Springfield/Branson, Hercules Glades

Wilderness, local communities, and other sensitive receptors. The Forest realizes the future of ecosystem and fuels management depends on how well we identify and protect both local and regional sensitive receptors. Because of this concern, the following measures have been initiated to mitigate potential impacts:

During planning, computer models such as FOFEM, VSMOKE, or SASEM are used to help estimate total emissions, smoke dispersion and downwind concentrations. •Prescribed burns are only implemented when there is a minimum mixing height of 500 meters and a minimum transport wind speed of 3 meters per second.

Prescribed burns are only implemented when the wind direction will carry smoke away from sensitive receptors such as St. Louis, Hercules-Glades Wilderness, hospitals, major highways, or other sensitive receptors identified during site-specific planning.

EPA is to be commended for using the BlueSkyRAINS approach to help formulate their comments. The Mark Twain is excited about the potential of BlueSkyRAINS to assist managers in planning and executing prescribed fires which minimize air quality impacts. We are working closely with the model developers and scientists as they work to make the model more national in scope to support fire operations.

EPA's modeling indicated a single burn burning over a seven day period (simulating several burns over a seven day period) would yield 0.1 microgram per cubic meter (µg/m3) increase of PM 2.5 at a pre-determined sensitive receptor (Hercules Glades/St Louis). The Mark Twain is also concerned about smoke impacts to non-attainment and Class I areas and, as stated above, would seek wind directions, wind speeds and mixing heights that send smoke away from these areas.

PC#513 C,D,E,F,G,H,I,J,K - An air quality analysis will be considered in appropriate site-specific NEPA analysis for prescribed burning. Smoke management analysis and implementation is tied to the Forest Plan through site-specific NEPA analysis and implemented through the site-specific burn plan. All of these plans must meet National and Regional Forest Service Manual direction. Additionally, the Forest is working to update its smoke management guidance and will use as a foundation the document: "A Comprehensive Guide to Incorporating Air Quality Effects of Prescribed Fire Management into Mark Twain National Forest Land Management Planning". The smoke management guidance for the Mark Twain will be finalized with an eye towards incorporating procedures of a state-wide smoke management plan still yet to be developed.

The Missouri DNR smoke management plan should address all prescribed burning within the state. Initial meetings with Missouri DNR and the Forest Service have occurred. The basic framework should address:

- Authorization to Burn
- Minimizing Air Pollutant Emissions
- Smoke Management Components of Burn Plans
- Actions to Minimize Fire Emissions
- Air Quality Monitoring
- Evaluation of Smoke Dispersion
- Public Notifications and Exposure Reduction Procedures
- Public education and Awareness
- Surveillance and Enforcement

The Mark Twain is not the only agency that creates smoke from prescribed in Missouri. Prescribed burns are accomplished by the National Park Service, Fish and Wildlife Service, and the State of Missouri. Adding to the number of agencies that may affect the air quality in Missouri are those agencies in adjoining states such as Arkansas and Oklahoma.

The Missouri DNR State Implementation Plan, when completed, should be the instrument to monitor and coordinate prescribed burning within the state. Until a regional plan is initiated, coordination will need to be accomplished between the Missouri Interagency Coordination Center (MOCC) and the Arkansas Oklahoma Interagency Coordination Center.

PC#513L - The Forest Service takes seriously its commitment to protect human health (including Environmental Justice populations) and sensitive air quality areas from current and future air quality impacts. These sensitive areas are considered during the planning and implementation of prescribed burns. We understand our responsibility to stay within National Ambient Air Quality Standards and to minimize impacts at non-attainment areas, Class I areas, and other identified sensitive areas. These elements are addressed at the project level of NEPA compliance and implemented through operations prescribed in the site-specific fire plan.

Prescribed burning effects and impacts are analyzed on a project level when and if a burn plan or NEPA project involving burning is proposed. Environmental justice impacts will likewise be examined diligently on a project level basis. Smoke effects to sensitive and low-income populations can not be analyzed properly at the programmatic level.

PC#513M - The EPA's comment is correct; the 2005 Forest Plan does not authorize the use of prescribed burning, it merely allows for it and depends upon further site-specific environmental analysis. Thus the 2005 Forest Plan does not contain any specific authorization of "how, when or where and to what extent prescribed fire may be used".

The 2005 Forest Plan does not authorize any ground-disturbing actions or by itself produce environmental effects. With regard to prescribed burning and other aspects of resource management, the Mark Twain Forest Plan is analogous to a zoning document and functions as a general planning tool. It provides standards, guideline, and other management direction in a framework guiding development of future site-specific decisions. Adoption of the 2005 Forest Plan does not effectuate any on-the-ground changes, e.g. prescribed burning. Nor does it dictate that any particular site-specific action causing environmental injury must occur. Before any environmental effects occur from prescribed burning, a site-specific environmental analysis must be completed. This site-specific process includes public involvement, and often a formal opportunity for notice, comment and administrative appeal. Attempting to attribute prescribed burning environmental effects to the 2005 Forest Plan alone, without reference to a particular site-specific action, takes us into a realm of speculation and conjecture and away from the NEPA's twin goals of public disclosure and informed decision-making. While the 2005 Forest Plan provides a framework for development of burning projects, extensive up-front Forest-wide effects disclosure is simply too speculative to be of much value.

In short, the 2005 Forest Plan is not the final word on prescribed burning on the Mark Twain National Forest. It does not decide where, when, or how burning will occur or not occur over all or part of the Forest. The 2005 Forest Plan is intended to be a dynamic document which will be reconsidered and amended as necessary. The 2005 Forest Plan is a framework to guide future on-the-ground prescribed burning projects, and thus the environmental effects disclosure in the FEIS is proportional to match the programmatic nature of the analysis.

PC#513 N - The Mark Twain is pleased that EPA is willing to work with the forest to identify ambient monitoring tools that can be used on prescribed burns. Our current capabilities in deploying remote, portable monitors e.g. "Datarams" or "E-Bams" are focused more on measuring particulate matter. If EPA feels more sophisticated monitoring is necessary, the Forest looks forward to partnering with EPA (and the State) to develop and implement a monitoring strategy pertinent to prescribed fire.

General Theme 13 - Riparian and Wetlands

Theme 13.1 Definition of Riparian Management Zone (RMZ)

PC# 48 - The Mark Twain National Forest should reconsider using any features other than levees as Riparian Management Zone Boundaries.

PC# 48 – One of the main purposes of the RMZs is to protect the functionality of the area. The professional judgment of the Plan revision IDT is that raised road beds and other man-made features can and do alter the hydrologic function of an area. Therefore, the functionally, diversity and habitat to be protected is already altered by this feature, and it is logical to use it as a boundary for the RMZ. With the alteration of the hydrologic regime of the area, in many cases the plant life and the functionality of the area beyond the created barrier have been altered.

PC# 79 - The Mark Twain National Forest should clarify its definition of Watercourse Protection Zones.
A) Including removing the protection of "dry-side drainages".

PC#79 - Watercourse Protection Zones (WPZ) are described in the 2005 Forest Plan on page 2-4 as those areas "along all stream channels that have defined banks and streambed, show signs of annual scour, have accumulated sediment and gravel of various sizes within the streambed, and are not included in the RMZ." The development of the definition of the WPZ was carefully made, considering a body of research dealing with effects of forest management activities in headwater streams (FEIS pages 3-218, 3-223). Additional information is contained in the Project Record. The boundaries of WPZ's will be identified through site-specific evaluation of individual conditions by District employees on-the-ground.

PC# 105 - The Mark Twain National Forest should offer greater protection from impact of mine tailings ponds, timber harvesting, grazing, and roadbuilding.
A) By extending Riparian Management and Watercourse Protection Zones to be 100 feet from streams.
B) For Riparian Management Zones and Watercourse Protection Zones.

PC# 105 – The 2005 Forest Plan does not allow timber management activities, log landings, mine tailings, equipment operations, and drilling or drilling structures in the RMZs. In the WPZ, management activities within 25 feet of the channel are prohibited, and restrictions are placed on how activities are to be carried out within the remaining 75 feet, 2005 Forest Plan pages 2-4 and 2-5. In the WPZ, drilling and associated structures and equipment operations should be avoided whenever possible. In the RMZ and WPZ, new roads are prohibited unless there is no feasible alternative. The 2005 Forest Plan has more guidance than the 1986 Forest Plan in protecting the riparian and upland waterways. All guidelines must be followed and, if in some cases they are not, the reason why must be explained in the project level NEPA document and the impacts of those actions must be disclosed.

PC# 164 - The Mark Twain National Forest should review additional documentation for forest management.
A) Including guidelines by Semlitsch and Bodie (2003) in determining Riparian

Management Zones.
B) Including a review of Journet and Logan (2005) regarding sustainable forestry.
C) Including guidelines by Semlitsch and Rothermel (2003) regarding buffer zones.
D) Including information provided at www.fs.fed.us/eng/road_mgt/overview.shtml, and the reports "Lost in the Forest: How the Forest Service's Misdirection, Mismanagement, and Mischief Squanders Your Tax Dollars", and "Seeing the Forest for Their Green".

PC# 164 A and C - The IDT worked a long time to develop the definition for RMZ and buffer zones around wetlands that is in the revised plan. Numerous scientific resources were consulted in making the final definition that encompassed the functionality and uniqueness that the Forest Service wishes to protect. These definitions for delineation were developed to protect what needed to be protected and move away from the "one size fits all" approach of fixed width buffers that are found in the 1986 Forest Plan. The proposed definitions and delineations are scientifically based and definable on the ground in the Ozarks, based on field testing. We have reviewed the Semlitsch and Bodie (2003) and Semlitsch and Rothermel (2003) references. The fixed numbers in this document does not take into account the soils, vegetation, and functionality of the area. We agree with the concept that there are areas where the protection of the riparian areas needs to be extended beyond the current 100 feet, and we believe the Forest Service is in line with that concept. The 2005 Forest Plan allows for the creation of variable sized buffers around the riparian areas for protecting their unique diversity and functionality. Page 2-14 of the 2005 Forest Plan creates buffers on the larger fens that extend beyond the 100 feet. The Forest Service recognizes and understands the concerns raised in these references and we have developed a plan that is more protective of species and habitat diversity, while considering the multiple use objectives within which we operate. The proposed plan does not prohibit the creation of larger buffers around sensitive locations at the project level.

PC# 164 B - We reviewed the policies listed in Journet and Logan (2005) and believe that our ecosystem sustainability approach remain consistent with the Multiple Use/Sustained Yield Act and the National Forest Management Act. We do not believe that any changes are warranted based on a review of the material (see project file).

PC# 164 D. We have considered the information in the references recommended by the commenter. We believe that the goals and objectives for restoring and enhancing terrestrial and aquatic ecosystems, habitat for wildlife and species of conservation concern, and standards and guidelines to protect special areas meets the intent of EPA's restoration principles (referenced in "Seeing the Forests for Their Green"). Further, the same article cites the Society of Ecological Restoration. The MTNF intends to implement specific management activities to restore Missouri's ecosystems based on principles and techniques outlined in "The tallgrass restoration handbook for prairies, savannas, and woodlands," a publication supported by the Society for Ecological Restoration. Much of the above-referenced article quotes numerous studies of the social, economic, and environmental effects of logging activities in the Pacific Northwest. The MTNF has considered and does not feel that this study is relevant to the Mark Twain National Forest, and is not aware of any similar studies for the Ozark Highlands region. With respect to the article "Lost in the Forest" on the subject of new road construction and maintenance, the FEIS makes it clear on page 3-275 that "Management emphasis will be placed on maintaining or reconstructing existing roads, rather than constructing new roads."

PC# 382 - The Mark Twain National Forest should increase the acreage of Riparian Management Zones and Watercourse Protection Zones.
A) Because cave and karst resources would be better protected.
B) Because it will decrease the degradation of water due to grazing.

PC# 382- Thank you for your support of the MTNF direction and comments

Theme 13.2 - Uses in Riparian Management Zone (RMZ)

PC# 14 - The Mark Twain National Forest should retain a percentage of larger fields as open land.

PC# 14 – Page 3-219 in the FEIS shows the increase amount of open lands that are currently found in the RMZs compared to historic amounts. Open lands will be able to be maintained in other locations on the forest. The MTNF is not proposing complete elimination of open lands. The MTNF is moving to restore areas more in line with the natural conditions for riparian areas.

PC# 49 - The Mark Twain National Forest should reconsider prohibiting construction of sanitation facilities within the Riparian Management Zones.

PC# 49 – Restricting the construction of sanitation facilities in the RMZs is a measure to help reduce the potential for waste matter entering the stream system. This standard is a continuation of current management direction for the frequently flooded riparian ecosystem (page IV–54, 1986 Forest Plan.).

PC# 50 - The Mark Twain National Forest should clarify if its intent is to prohibit mine tailings ponds within Riparian Management Zones.

PC# 50 - Prohibiting mine tailings ponds in the RMZs, as stated on page 2-4 of the 2005 Forest Plan, does not limit their construction on the rest of the Forest. The RMZs constitute about 65,000 acres out of the 1.5 million acres that make up the Mark Twain National Forest. The RMZs tend to be prone to flooding and by prohibiting tailings ponds in these areas, we are reducing the potential risk of adversely affecting water quality of the adjacent streams.

PC# 51 - The Mark Twain National Forest should allow new recreational facilities and opportunities in Riparian Management Zones.

PC# 51 – This guideline is a continuation of current management within the riparian ecosystem. It does not prohibit new development, but guides managers to consider the best location for recreational facilities, which would minimize impacts to the riparian ecosystem.

The recreation facilities that would be created in the RMZs are to be low cost and must be flood resistant (page 2-23, 2005 Forest Plan.) Continuing to build facilities in these areas, can result in very large upkeep and rebuilding costs with the flooding that these incur. Additionally new construction in these areas has the potential to increase sedimentation in the local streams in the short term and alter the hydrologic regime of the area in the long term.

PC# 227 - The Mark Twain National Forest should not construct new recreational facilities in Riparian Management Zones.

PC#227 - While construction of recreation facilities is not prohibited in the 2005 Forest Plan, it places several restrictions on what types of facilitates and the investments that may be made into those facilities. On page 2-23 of the 2005 Forest Plan there are several standards and guidelines designed to minimize human disturbance to these areas. It should be noted that while deviation from guidelines does not require a Forest Plan amendment, the reasons for and impacts as a result of not following a guideline must be discussed in the site-specific analysis and NEPA documentation. See also response to PC#51 (Theme 13.2).

Theme 13.3 - Fens

PC# 172 - The Mark Twain National Forest should clarify if the modification of beaver-created impoundments may be necessary to protect certain fen areas.

PC# 172 - The Forest can modify beaver created impoundments if necessary to protect riparian resources, including fens. On page 2-5 of the 2005 Forest Plan, the full guideline allows for modification to occur for certain reasons, including the protection of threatened, endangered and sensitive species and their habitats. The plan allows for the flexibility to manage these areas as needed to protect the resources.

Theme 13.4 - Goals for wetlands

PC# 77 - The Mark Twain National Forest should "prevent wetland degradation" as opposed to "minimize wetland degradation".

PC# 77 - After reviewing the document and considering your comment, the Plan has been changed as recommended. Goal 1.3 now reads "Prevent wetland degradation and loss, and restore and enhance wetlands when possible." Objective 1.3d was created to further emphasize the importance of wetlands. Objective 1.3d reads, "Protect and improve 900 acres of wetlands."

Theme 13.5 - Objectives for wetlands

PC# 78 - The Mark Twain National Forest should reconsider woody material loading objectives.

PC# 78 - Large woody material (LWM) has historically been a part of the Ozarks stream systems. Current LWM levels are much below suspected historic levels. LWM is naturally occurring in nature and in streams; we do not see a conflict with the guideline of creating habitat structures to be naturally appearing when possible. This is an objective designed to move stream systems back to a more natural condition.

Theme 13.6 - Riparian and Wetlands Standards and Guidelines

PC# 304 - The Mark Twain National Forest should change standards and guidelines regarding Springs, Seeps, Fens, Sinkholes, and Shrub Swamps.
A) Including making all of the guidelines into standards.
B) Including making the buffer for timber harvesting at least 200 feet from a sinkhole, cave, fen, skidtrail, or other wetland feature.
C) Including clarifying the standard regarding new roads near fens.
D) Including making into standards the guidelines that only allow fords to be used when stream bottoms can support the use.

PC# 304 A & D, PC# 321 I, M, N and PC# 322 - Standards and guidelines are permissions or limitations that apply to on the ground implementation of management practices. A Standard is defined as a course of action or a level of attainment that must be reached to achieve Forestwide goals. In general, standards limit project-related activities—not compel or require them. Deviations from Standards requires a Forest Plan amendment and must be analyzed and documented in an environmental analysis. A Guideline is a course of action that should be followed in most circumstances. However, Guidelines relate to activities where site-specific factors may require some flexibility. Deviations from a Guideline must be analyzed and documented in a project level analysis but do not require a Forest Plan amendment. We feel the protective measures for springs, seeps, fens, sinkholes, and shrub swamps should be flexible accommodate the unique, site-specific characteristic of each.

PC# 304 B – The IDT felt that 100 feet was adequate for most activities around caves and sinkholes, the buffer size does increase for larger fens and wetlands, 2005 Forest Plan page 2-14.

PC# 304 C - While we understand your comment, the MTNF must maintain the flexibility to manage the land as needed. If a new road is needed in the vicinity of a fen, there are other standards and guidelines in place to minimize the impacts of that action. Page 2-14 of the 2005 Forest Plan establishes a buffer zone around fens. Within this buffer zone, roads are prohibited unless needed to facilitate specific restoration objectives. Also any roads will be designed so the runoff does not change the natural hydrologic functioning of the fens. In locations of existing roads, if feasible, they should be altered to restore the natural hydrologic flow of the fen.

PC# 321 - The Mark Twain National Forest should change standards and guidelines regarding Riparian Management Zones.
A) Including documentation of rationale for delineations.
B) Including extension of boundaries for Riparian Management Zones to 200 feet.
C) Including clarification of desired conditions.
D) Including prohibition of grazing in Riparian Management Zones unless used to combat non-native invasive species.
E) Including prohibition of new motorized trails.
F) Including restriction of timber harvest to non commercial cut and leave.
G) Including chemical use only if it is essential.
H) Including placement of livestock distribution tools.
I) Including removal of mineral material.
J) Including livestock distribution tools and recreation facility guidelines as standards.
K) By making more stringent standards.
L) Including protection for Riparian Management Zones once they are established.
M) By writing the new guidelines as enforceable standards.
N) Including Watercourse Protection Zones.
O) By removing the prohibition on drilling as a standard and making it a guideline.
P) Because once the BLM determines that a "valuable deposit" has been discovered, the Forest Service does not have the regulatory authority to reject such a discovery.
Q) Including removing existing motorized trails and crossings, not just preventing new ones.

PC# 321 A – The delineations will be made during a project level analysis by an interdisciplinary team. This group will make the decisions based on the definitions of where the lines should fall. The IDT should be able to describe why the delineation is located where they set it.

PC# 321 B - The IDT worked a long time to develop the RMZ definition in the 2005 Forest Plan. Numerous scientific resources were consulted in making the final definition that encompassed the functionality and uniqueness that the Forest Service wishes to protect, while still providing a definable buffer on the ground. The RMZ definition allows resource managers to consider the site-specific soils, vegetation, and functionality of the area, rather than rely upon a fixed width buffer. Where the protection of the riparian areas needs to be extended beyond 100 feet, managers have the flexibility to meet this need. The RMZ definition is scientifically based and definable on the ground in the Ozarks, based on field trails.

PC# 321 C - It is not practical for a programmatic document such as the Forest Plan to determine the desired condition for every RMZ on the Forest. General desired conditions are based on the natural community types found in the RMZ (2005, Forest Plan, page 2-3). Site-specific desired conditions will be determined at a project level, using on-site characteristics,

the historic vegetation mapping, and professional judgment based on local plant responses and silvicultural methods.

PC# 321 D - Grazing in RMZs is being phased out. Grazing on existing allotments in the RMZ will be allowed to continue until the current permit expires. Livestock in these allotments must be fenced at least 100 feet from the streambank. In addition, grazing in these existing allotments will not be allowed to degrade the RMZ or its functionality (2005 Forest Plan page 2-21.) The impacts of grazing in the RMZs are found in the FEIS on page 3-243 through 3-246. In summary, livestock does have the potential to increase sedimentation and erosion, impact water quality, and affect the riparian vegetation of an RMZ. That is why these allotments will be closed at the earliest opportunity. Until that can be done, the impacts will be minimized by fencing the animals 100 feet from the stream banks, and taking measures to prevent the animals from congregating in these sensitive habitats. Monitoring requirements for grazing practices will be in accordance with the watershed health and riparian areas, 2005 Forest Plan page 4-12. The exact parameters to be measured will be developed in a monitoring plan that will provide additional guidance of how to carry out the direction in Chapter 4 of the 2005 Forest Plan.

PC# 321 E - The 2005 Forest Plan prohibits the construction of new motorized trails in the RMZs, except at designated crossings, page 2-23. Any construction of a motorized trail will follow the standards and guidelines in the transportation section, pages 2-38 – 2-42. Impacts of motorized trails are included in the analysis impacts of the transportation system in the RMZ. These are similar to those described in the impacts transportation system on the riparian area, FEIS pages 3-232 through 3-239. The inclusion of the motorized trails in this analysis is clearly stated on page 3-232 at the beginning of the section. In summary, motorized trails and roads, when not mitigated, have the potential to affect riparian and aquatic ecosystems through erosion, sedimentation, changes to channel morphology, and restricting fish passage. However, through the standards and guidelines and objectives, the impacts should be reduced over time on existing roads and trails and to avoid impacts of new construction in the long term.

PC# 321 F - Alternative 1 addresses management using non – commercial methods.

PC# 321 G - The IDT feels that the standard as written will allow for the flexibility of management needed to complete the objectives of the MTNF. The standard as written gets to the same point as the suggested re-write.

PC# 321 J - New trails and sanitation facilities are prohibited, any other facilities that would be created must be restricted to low cost and they must be flood resistant, 2005 Forest Plan page 2-23. The site specific impacts of flooding would be analyzed during the project level NEPA process. Several standards and guidelines are in place to protect the riparian ecosystems.

PC# 321 K - The IDT feels that the standards and guidelines that were developed for the RMZ will protect and enhance the riparian resources and diversity. Specific direction was not provided in your letter as what standards should be more stringent, so those can not be addressed at this time.

PC# 321 L and I –We understand your concern about sand and gravel mining operations, and the impacts that they can have on the ecosystem. The Mark Twain National Forest is not a regulatory agency and does not have the authority to regulate what is done on private lands or by county governments. The removal of such material on National Forest System lands is prohibited in stream channels or the RMZs unless needed for the protection of infrastructure or for public health and safety, 2005 Forest Plan page 2-36.

PC# 321 L –The RMZs are designed to protect the functionality of the riparian areas. The delineation characteristics (2005 Forest Plan page 2-2 and 2-3) are designed to allow for flexibility and larger protection areas when needed. The RMZ buffers are to catch and prevent sedimentation and other pollutants from reaching the streams. The 2005 Forest Plan prohibits logging, new trails, and traffic in the RMZs (page 2-3 and 2-4). Grazing animals are prohibited from being within 100 feet of the stream banks. Allotments in the RMZs are to be closed at the earliest opportunity, and any grazing is not allowed to degrade the RMZ or its functionality (page 2-21).

PC# 321 O and P – The standards and guidelines were developed by an interdisciplinary IDT, based on their knowledge and the needs of the MTNF. While drilling sites may not have a permanent long term impact, when located in the RMZ they create openings and increase the potential for sedimentation and runoff into the local stream channels. All activities are minimized and restricted within the RMZ. Providing buffers from activities in a riparian corridor is a recommendation backed by science that helps reduce the impacts to the riparian area and water resources. It helps maintain water quality. Timber activities are only allowed to move the area toward the desired condition.

PC# 321 Q - There is nothing in the plan that prevents the removal of motorized stream crossing when that is a practical and feasible alternative.

PC# 322 - The Mark Twain National Forest should change standards and guidelines regarding Watercourse Protection Zones.
A) Including restriction of timber harvesting to non commercial cut and leave.
B) Including chemical use only if it is essential.
C) Including placement of livestock distribution tools guidelines as standards.
D) Including recreational and sanitation facilities guidelines as standards.
E) Including drilling and associated structures guidelines as standards.
F) Including man-made impoundments guidelines as standards.
G) Including mine tailings ponds and water diversions structures guidelines as standards.
H) Including hydrologic control structures to mimic as much as possible the appearance and function of natural habitat features in the RMZ and WPZ.
I) Including prohibiting mining and exploration activities with the MPZ.
J) Including ensuring that there are no motorized trails within the WPZ.
K) Including ensuring that the construction of trails for hiking, horseback riding and biking should be conducted in a manner sensitive to the resource.
L) Including a standard that all ford crossings will be surveyed for mussels by a qualified biologist prior to construction of any ford.

PC# 322 A – Alternative 1 looks at providing management in a non-commercial approach.

PC# 322 I –There are restrictions to equipment operation in the WPZ. All exploratory drilling, pad construction and structures are to be avoided whenever possible (2005 Forest Plan, page 2-35).

PC# 322 J & K – All new trails and improvements in the WPZ must be done to minimize the impacts on the ecosystem (2005 Forest Plan, page 2-23.) Any construction of a motorized trail will follow the standards and guidelines in the transportation section of the 2005 Forest Plan pages 2-38 – 2-42. This includes locating all new construction outside the WPZ whenever possible.

PC# 322 L – New standards and guidelines have been added to the 2005 Forest Plan to protect mussel species (page 2-8).

PC# 369 - The Mark Twain National Forest should review policies regarding dams.
A) Because beaver dams restrict flow through spillways.

B) Including barite tailings dams.
C) Including removal of beaver dams from the spillway control structures.

PC# 369 A and C - Beaver dams created in spillway control structures can cause numerous problems to dam structures. However, they were not included in the listing of primary maintenance activities occurring on the MTNF in relation to dams, as they are not a common problem associated with spillway structures on Mark Twain National Forest lands. A guideline allows the removal of beaver-created impoundments when they affect human health and safety, private property, threatened, endangered, and sensitive species and their habitat (page 2-7, 2005 Forest Plan.)

PC# 369 B - Thank you for the noting the omission of barite tailings ponds. The analysis in the FEIS includes all tailings ponds, not just those from lead mining activities.

Theme 13.7 - Karst

PC# 365 - The Mark Twain National Forest should provide increased management of caves and karst resources.
A) Including permit systems, additional gating projects, monitoring, and road closures.
B) Including identification of the karst watershed of springs and caves before large area even-aged management approaches are instituted.
C) Including a well-designed program of dye-tracing and karst watershed delineation.
D) Including recognition of the unique character of karst geology of the Ozarks.

PC# 365 A, B, C - We share your concern for implementation challenges. Decisions regarding physical protection of caves (i.e. gating or fencing) are more appropriately made during site-specific analysis, and not at the programmatic level. The 2005 Forest Plan does require that any structure place in a cave entrance be designed to allow free passage by bats, regardless if they are federally listed or not (Forest Plan page 2-10).

Chapter 4 (Monitoring and Evaluation) of the 2005 Forest Plan includes monitoring of special habitats (including caves) (2005 Plan page 4-11) and effects on water quality and quantity (2005 Plan page 4-12). While this does not explicitly state that subsurface waters are included, it does allow for subsurface water monitoring such as dye-tracing and cave or spring recharge delineation. This item has been modified in the 2005 Forest Plan to include the word “karst” in order to make it clear.

PC# 365 SC# D - The Mark Twain National Forest recognizes the importance of cave and karst resources and the connections between surface uses and subsurface conditions, including the relationship between Big Springs and NFS lands. The 2005 Forest Plan contains standards and guidelines designed to protect both the surface expressions of karst (cave openings, sinkholes, springs, etc.) and the interconnection between surface and subsurface watersheds Chapter 4 (Monitoring and Evaluation) of the 2005 Forest Plan also includes monitoring of special habitats (including caves) (2005 Plan page 4-10). Guidance for mineral operations on National Forest lands is found on pages 2-34 through 2-36 of the 2005 Forest Plan. This guidance is designed to protect all forest resources, including karst and both surface and subsurface waters, during and after any mineral activities. In particular to karst resources, there is a standard prohibiting surface-disturbing mineral activities within 100 feet of the edge of a cave entrance, spring, seep or sinkhole.

PC# 506 - The Mark Twain National Forest should consider that Big Spring is hydrologically tied, through a mature karst system, to lands within the Forest up to 40 or more miles away, as has been verified by dye tracing.

PC# 506 – The Forest Service does recognize the importance of considering the entire landscape when planning and implementing management activities. We also recognize that the MTNF exists in a region of highly developed karst terrain and how interconnected the surface and ground waters of the region can be. Potential impacts on Big Springs from projects to be implemented on National Forest System lands would be evaluated at the site-specific level at the during project analysis.

Theme 13.8 - Protect Water Quality

PC# 161 - The Mark Twain National Forest should provide protection for waters in the Mark Twain National Forest.
A) Including keeping them clean of chemicals and pollutants.
B) Including the Ozark streams.
C) Including a watershed and groundwater program.
D) Including protection and enforceable standards for Riparian Management Zones and Watercourse Protection Zones.
E) Including Riparian areas.
F) Including requirement for a 100 foot distance from each bank for Riparian Management Zones.
G) Including a 300 foot distance from each bank for Riparian Management Zones.
H) Because a 100 foot buffer for Watercourse Protection Zones seems arbitrary and may not protect some areas and some species.
I) By eliminating or reducing even-aged management, lead mining, and expansion of roads and herbicide use.
J) Including a ban on timber harvesting in Watercourse Protection Zones.
K) Because of their use for recreation, drinking water, and species that depend on them.
L) By developing plans that reflect watershed values.
M) By fully assessing the impacts of different land uses.
N) Including a watershed restoration program to reduce management activities that harm water quality and riparian ecosystems.
O) By maintaining fully forested conditions within its boundaries.
P) By making water quality a guiding principle in the forest plan.
Q) Including 303(d) listed waters that exist in the Mark Twain National Forest.
R) Including special emphasis on protecting water quality in National Scenic Riverway areas, areas designated as outstanding water resources areas, areas with unusual or high-quality hydrologic features, karst areas and groundwater resources, and stream reaches of all classes, including headwaters and small tributaries.
S) By addressing the impacts of timber harvesting on groundwater.
T) Including Bull Creek.

PC# 161 A – The Mark Twain National Forest has developed the standards and guidelines associated with the Riparian Management Zones and the Watercourse Protection Zones for the purpose of helping ensure that chemicals or other pollutants from our management will not enter the streams at levels that would have long term impacts.

PC# 161 B, E, I, K, L and N–The MTNF recognizes the importance of the water resources in the Ozarks. The need for improved guidance for protection of this resource was one of the reasons riparian and water quality were listed as areas needing change in the Notice of Intent. Several standards and guidelines were developed to minimize the impacts of management activities to the Riparian Management Zones (RMZ) and Watercourse Protection Zones (WPZ) locations, as well as associated karst features. The 2005 Forest Plan has standards and

guidelines related to minimizing impacts on waterways in the MTNF. These standards and guidelines are for RMZs, WPZs, wetlands, fens, sinkholes, springs, caves, etc. The creation and implementation of these standards and guidelines reflects the need for greater protection for the watershed values that are important and vital to maintaining healthy ecosystem in the Ozarks. Watershed restoration and improvement projects are generally incorporated in most management projects on the MTNF. With the implementation of the 2005 Forest Plan, the restoration of the 1.1 areas will help improve the watersheds in those areas.

PC# 161 C – All the standards and guidelines developed in this 2005 Forest Plan are designed to protect surface and ground water resources that could potentially be affected by management activities on the MTNF.

PC# 161 D - Standards and guidelines are permissions or limitations that apply to on the ground implementation of management practices. A Standard is defined as a course of action or a level of attainment that must be reached to achieve Forestwide goals. In general, standards limit project-related activities—not compel or require them. Deviations from Standards require a Forest Plan amendment and must be analyzed and documented in an environmental analysis. A Guideline is a course of action that should be followed in most circumstances. However, Guidelines relate to activities where site-specific factors may require some flexibility. Deviations from a Guideline must be analyzed and documented in a project level analysis but do not require a Forest Plan amendment.

PC# 161 D, F, G, and H - Numerous scientific resources were consulted in drafting the final definition that encompassed the functionality and uniqueness that the Forest Service wishes to protect, while still providing a definable buffer on the ground. The RMZ definition allows resource managers to consider the site-specific soils, vegetation, and functionality of the area, rather than rely upon a fixed width buffer. Where the protection of the riparian areas needs to be extended beyond 100 feet, managers have the flexibility to meet this need. The RMZ definition is scientifically based and definable on the ground in the Ozarks, based on field trails.

PC#161H - The 100-foot buffer on each side of a WPZ channel was developed after considerable discussion of management activities and scientific information and direction used in other agencies. The 100-foot zone provides a filtration zone for run-off into the channel as well as protecting the habitat along these smaller channels. This continues guidance from our 1986 Forest Plan, and allows for the protection to continue further up the channel. The 2005 Forest Plan allows for a flexible width of buffer for the RMZ based on function, habitat, soils, and landforms.

PC# 161 J – Although there are timber activities allowed in the remaining 75 feet of the WPZ, restrictions are placed on them as how the activities will be carried out to reduce any potential impacts, 2005 Forest Plan page 2-30.

PC# 161 M – The cumulative effects on surface and ground water resources were addressed in the FEIS on pages 3-247 and 3-249. These effects are general and relational as it is not practical or feasible to address 1.5 million acres with the detail you would expect to find in a project level analysis. Any management activities proposed on the MTNF will be analyzed in site-specific project level NEPA, and impacts and effects for specific locations will be addressed at that time.

PC# 161 O – The Ozarks was a mixture of forests, open and closed woodlands, savannahs, glades, and prairies. The MTNF is moving in a direction to restore the natural communities that were found in this region, including a better balance of the canopy closures.

PC# 161 P - The commenter did not provide guidance or direction in which they would like to see management go, therefore no specific response can be provided.

PC# 161 P – The Mark Twain National Forest agrees with your assessment that total watershed health must be managed on a larger scale than the Forest Service alone can provide. The 2005 Forest Plan only address waters within the MTNF because it is the only land the MTNF has control over. The MTNF is the managing agency of the Eleven Point National Scenic River only. The Mark Twain can only enforce management on portions of other rivers within our ownership. The effects on a watershed scale are addressed in the cumulative effects section, and would be covered in more detail during a project level analysis. While the MTNF recognizes the impacts and challenges of protecting water quality through a watershed scale approach, our broken ownership pattern and small ownership in many watersheds makes that a very difficult challenge. The MTNF conducts all activities in such a way to minimize adverse effects. One of the greatest ways the MTNF can influence private land management is to conduct our operations in such a way that sets a good example to the surrounding private land owners.

PC# 161 Q and R – Thank you for your support.

PC# 161 S – Pages 3-239 through 3-241 of the FEIS discuss the impacts of timber management activities on the water and riparian systems within the Forest.

PC# 161 T - The proposed standards and guidelines for the Riparian Management Zones and Watercourse Protection Zones will provide protection for Bull Creek. These forest wide standards and guidelines are designed to minimize all impacts to the stream systems and watersheds. Project level analysis, if work was planned for the area around Bull Creek, would identify if additional mitigation measure would be needed to maintain the integrity of the watershed.

PC# 348 - The Mark Twain National Forest should address the need to protect and restore the eleven watersheds that are in poor condition and the nine watersheds that are considered priority in the final plan.
A) Because addressing water quality and environmental concerns in all of the 65 watersheds will ensure that the outcome of the other uses of the forest will not cause irreparable damage to the upland forest, the riparian corridor or the streams themselves.

PC# 348 – The water quality and Environmental concerns for the 65 watersheds on the MTNF have been identified in the Watershed Assessment Report: Forestwide Assessment that was conducted in 2001.

PC# 355 - The Mark Twain National Forest should discuss criteria and ramifications of Outstanding National Resource rivers designations.
A) Including Eleven Point River.
B) Including an addendum to the Forest Plan stating "Those streams flowing through Carman Springs Natural Area are designated outstanding state resource waters" and provide protection in accordance with state regulations.
C) Including Outstanding Natural Resource Water Classification for the Black River.
D) Including implications for minerals development.

PC# 355 - The Department of Natural Resources designates Outstanding National Resource Rivers. We have no jurisdiction or regulatory authority over land uses on streams that flow outside our ownership. The Outstanding State Resource Water designation does not affect the management of these waters within the MTNF. We are not notified of actions that occur on the streams if the actions are not within our boundaries. Numerous standards and guidelines have been developed to protect the waters on the MTNF, pages 2-2 thru 2-5, 2-10 thru 2-13,

2-14, 2-15, 2-16, 2-18 thru 2-22, 2-28 thru 2-30, 2-33, 2-34, 2-37 thru 2-40 of the 2005 Forest Plan. As stated in the preface of the 2005 Forest Plan, the Mark Twain National Forest will follow all applicable federal laws and regulations.

PC# 355 A and D – The ONR has been added to 2005 Forest Plan Goal 1.3, page 1-3. The Eleven Point River is designated in a 8.1 management prescription, which provides additional protection beyond the WPZs and RMZs. On page 3-53 of the Forest Plan, it states that surface disturbing mineral activities are normally prohibited and that the removal of common variety minerals is not permitted.

PC# 404 - The Mark Twain National Forest should include references to the requirement for a 404 Permit from the U.S. Corps of Engineers and a 401 Water Quality Certification before constructing permanent structures or road crossings across streams.

PC# 404 - When such activities are done, a 404 permit from the COE and a 401 certification from the state must be done according to the Clean Water Act. It was a decision by the IDT that all Federal and State guidance that must be followed during all management activities would not be included in the document, but all applicable laws, regulations, and executive orders would be enforced and followed.

PC# 520 - The Mark Twain National Forest should make the temporal boundaries for the cumulative effects more specific than "the planning period".
A) Because it may not account for land use projections that may cover a longer time span such as county master plans, existing plans of the State Economic Development Office, or other inputs valuable to a comprehensive cumulative impacts analysis.

PC# 520 – While it is recognized that other plans, including county master plans, State Economic Development Office, and others may cover longer periods than the planning period referred to in the FEIS, this period is all that can be addressed with the proposed management. The exact length this plan will be implemented is not specifically known. Current regulations stipulate that the plan must be revised at least every 15 years.

Theme 13.9 - Water quality studies

PC# 10 - The Mark Twain National Forest should acknowledge that the pH level of Trace Creek is a result of naturally occurring phenomena and not human activity.
A) Because increased regulation of the Trace Creek watershed would result in increased meddling in the affairs of private citizens.

PC#10 – Pages 3-225 and 3-226 of the FEIS notes that Trace Creek is 303d listed for pH, with the source being naturally occurring. The USFS does not make the determinations of what water bodies are listed as impaired. Those decisions are made through the EPA and the Missouri Department of Natural Resources. The Forest Service does not in anyway direct how private land is managed.

PC# 160 - The Mark Twain National Forest should use the most current United States Geological Survey water use studies.

PC# 160 - The USGS publishes a nationwide water use report every five years. The report that was referred to in the FEIS is a Water Use Information for the Missouri River Basin Report, OFR 90 – 189 (Waite, 1990). The local report, although older, provided more localized applicable information than the more recent nationwide report.

The MTNF has been reviewing and evaluating the USGS reports on the Eleven Point River areas as they have become available. The Cedar Creek Total Minimum Daily Load (TMDL) plan does not cover lands within the Mark Twain National Forest Boundary and does not affect the management of Cedar Creek on NFS lands. As additional TMDLs are completed

for the impaired streams that are within the MTNF boundaries, the MTNF will review and change the Forest Plan as needed.

PC# 511 - The Mark Twain National Forest should correct errors associated with claims that mixing occurs between Derby-Doe Run and Davis Formations.

PC# 511 – The FEIS has been changed to reflect that the vertical hydrologic conductivity of the St. Francois confining unit is small and does impede ground water flow between the Ozark and St. Francois aquifers, unless secondary permeability has developed along faults and fractures and other openings.

General Theme 14 - Soils

Theme 14.1 - Soils Standards

PC# 53 - The Mark Twain National Forest should clarify information regarding high compaction potential soils.
A) Because of implications regarding timber harvesting restrictions.

PC# 53 – The intent of standards and guidelines is to protect the soil resources as they occur on the forest, not to prohibit management activities. The only prohibition to activities on highly compactable soils is found on page 2-5 in the form of a guideline which states: "Minimize ground-disturbing activities on soils highly subject to compaction during wet periods." There are no over reaching prohibitions to these soils. The listing of highly compactable soils found in Appendix B was derived from the soil characteristics found in the county soil surveys conducted by NRFCS and does not encompass all soil series found on the MTNF. This guidance is a continuation of the 1986 Forest.

PC# 323 - The Mark Twain National Forest should change or add standards and guidelines regarding soil productivity.
A) Including making guidelines for minimizing ground-disturbing activities on soils highly subject to compaction during wet periods into standards.
B) Including highly compactable soils.
C) Including highly erodable soils.
D) Including fragipans soils.
E) Including analysis of how the alternatives will impact the soil under the Open Woodland Management Indicator.
F) Including suspension of operations during wet periods when excessive rutting and soil displacement are anticipated.
G) Including erosion control guidelines as standards.
H) Including making guidelines for skid trails into standards.
I) Including a standard that erosion control measures shall be employed throughout the life of soil-disturbing activities, not just after the activities are terminated.
J) Including prohibiting mechanical site preparation that exposes bare soil on more than 25 percent of the treated area.
K) Including requiring that exposed soil shall be scattered in small unconnected spots throughout the area rather than concentrated in a few large spots.

PC#323 A, B, C, D – Steps have been taken to clarify these sentences and the intent of each in the 2005 Forest Plan.

PC#323 E – One of the key monitoring indicators for Open Woodland Management Indicator in Chapter 4 is to assess the improvement in both ground cover and plant species richness. Prescribed fire and thinning are the primary tools applied to restoring open woodlands. Soil erosion studies following such treatments thus far show that soil loss is below tolerance levels for productivity and augmenting ecosystem restoration (Henderson et al. 1990, Statler et al. 1999, McCarty 2001, Amelon 1991), and that grass/forb ground cover

increases thereby increasing intact subsurface root mats that are often characteristic adaptations to fire-mediated natural communities. Project level NEPA documents often provide monitoring provisions or mitigation measures to assure acceptable levels of soil erosion.

PC# 323 F-I - Standards and guidelines are permissions or limitations that apply to on the ground implementation of management practices. A Standard is defined as a course of action or a level of attainment that must be reached to achieve Forestwide goals. In general, standards limit project-related activities—not compel or require them. Deviations from Standards require a Forest Plan amendment and must be analyzed and documented in an environmental analysis. A Guideline is a course of action that should be followed in most circumstances. However, Guidelines relate to activities where site-specific factors may require some flexibility. Deviations from a Guideline must be analyzed and documented in a project level analysis but do not require a Forest Plan amendment. The effects of logging on soils are discussed in the FEIS, pages 3-2587 – 3- 259. In general logging can affect the soil resources in several ways, including compaction, sedimentation and erosion and the productivity. The standards and guides that are in found in the 2005 Forest Plan would minimize the short term impacts and reduce the long term impacts.

The standards found on page 2-5 do not state that these measures are to be employed once a project is complete. The intent is that they will be carried out throughout the life of the project.

PC# 323 J - The limit of 25% of exposed bare soil of mechanical site preparation (page 2-29 of the 2005 Forest Plan) is designed to minimize the amount of exposed bare soil in a given area during a given time. The proposed addition to the standard has the possibility to hinder the ability of the Forest Service to manage the land as needed.

PC# 323 K - In most instances the bare soil exposed in the treated area would be scattered in small, unconnected spots, rather than concentrated in fewer and larger spots. However, on some sites effective management may require larger, more unevenly spaced spots. As written this allows managers the flexibility to manage.

PC# 408 - The Mark Twain National Forest should establish a level of acceptable soil loss based on location and soil type for timber harvesting roads and paths.

PC# 408 – Due to the variability of the soils, terrain and the activities that occur on the MTNF, as well as surrounding resources, a site specific evaluation is the best way to determine soil movement. FSH 2509.18 provides additional guidance on soils and what is acceptable.

General Theme 15 - Rangeland Management

Theme 15.1 - Range

PC# 75 - The Mark Twain National Forest should clarify its intentions regarding livestock use.

PC#75 - A goal of the Mark Twain National Forest is to provide range forage on open lands within the capability of sustainable ecosystems. Providing forage is allowed in designated allotments by permit only. The use of animals as a management tool to effectively control non-native invasive species is first mentioned in the Non-Native Invasive Species (NNIS) Management section of the proposed Forest Plan (page 2-2), and was repeated in the Rangeland Management section to indicate that livestock other than cattle and horses could be used as a management tool. However, their use would be by contract or some other

agreement, not by permit. In order to avoid confusion, this guideline has been removed from the rangeland management section and appears only in the NNIS management section of the 2005 Forest Plan.

PC# 238 - The Mark Twain National Forest should reconsider grazing in sensitive areas.
A) Including Riparian Management Zones.
B) Including open woodlands and glades in restoration area.
C) To protect Spring Creek.
D) To potect Lower Rock Creek.

PC#238 - Careful consideration has been given to which National Forest lands are appropriate for grazing or haying. Standards and guidelines have been developed in order to ensure there are no unacceptable effects to forest resources.

Standards for protection of the riparian management zone are found on pages 2-2 through 2-5 and 2-21 through 2-23 of the 2005 Forest Plan. Two important standards state that 1) Grazing shall not be allowed to degrade the riparian management zone; and 2) Grazing in riparian management zones shall be foreclosed at the earliest opportunity. Careful monitoring will insure these, and other standards, are adhered to and effective at protecting the riparian zones.

Standards and guidelines have been developed (2005 Forest Plan page 3-4 and 3-8) which eliminate grazing in glades and woodlands occurring in areas with an emphasis of restoration (Management Area 1.1 and 1.2).

The 2005 Forest Plan guides appropriate management on National Forest lands. Direct adverse impacts from actions carried out on private land are beyond the scope of the Forest Plan. The Final Environmental Impact Statement does address the reasonably foreseeable cumulative effects from activities occurring on private land.

PC# 300 - The Mark Twain National Forest should change goals, standards, and guidelines regarding Rangeland Management.
A) Including prohibiting grazing except to control non-native invasive species.
B) Including elimination of cool season pastures.
C) Including allotment plans.
D) Including desired conditions.
E) Including species composition objectives.
F) Including grazing of native species.
G) Including livestock distribution tools.
H) Including amending the standard to permit only cattle and horses to graze on allotments to allow bison.
I) Including a standard to exclude the placement of livestock distribution tools in Riparian Management Zones.
J) Including not allowing grazing within 500 feet of water resources.
K) Including wording to ensure that water quality, watershed, and streambank attributes are protected in any grazing activities conducted by the forest.
L) Including adding a standard to give priority allotment to demand for grazing of native ungulates (bison, wapiti, etc.) and gradually phase out grazing for cattle and horses.
M) Including adding a goal to implement an incentive program that will promote the stocking of native ungulates (bison, elk, etc.) on those areas where sustainable pasture of native grasses is in consonance with Goal 1.
N) Including new goals to gradually remove open pastures in formerly wooded areas.

PC#300 - Rangeland management, which includes grazing and haying activity, is an appropriate use of National Forests if conducted within the capability of sustainable ecosystems. The Multiple Use Sustained Yield Act of 1960 and the National Forest

Management Act of 1976 include provisions that guide the agency to serve the national interest by supplying renewable resources. The 2005 Forest Plan guides management of the range program so adverse effects to the environment are minimized.

Cool season pastures are open lands consisting of fescue, orchard grass, or other non-native grass species. These pastures are usually purchased by the Forest Service as part of acquisitions that include old farms. Most of these acquired pastures are well suited to continue providing grass for grazing or haying by permit. Environmental effects from cool season pasture grazing on appropriate sites are minimal. In Management Prescription 6.1 and 6.2, the 2005 Forest Plan will not permit grazing on cool season pastures but does allow grazing to be used to maintain native grassland communities.

Riparian management zones are important habitat areas along perennial streams. Forest wide standards have been developed to ensure these RMZ's are managed properly (2005 Forest Plan pages 2-2 through 2-5). These standards will ensure water quality as well as stream bank attributes are protected. The placement of livestock distribution tools is an important consideration for managing the pasture, livestock, and minimizing impacts. It will be a rare case when there is no feasible option for placing the distribution tools outside the RMZ. However, if a livestock distribution tool is placed in an RMZ (due to the fact that no other location for the tool is feasible), careful monitoring will be conducted to ensure that there is no degradation to the riparian management zone (standard on page 2-21 of the 2005 Forest Plan).

The 2005 Forest Plan includes several goals and objectives that will help move some of the riparian areas toward a desired condition that reflects the historic natural communities. This will help improve the ecological health and integrity of watersheds over the long term.

All standards and guidelines were developed by resource specialists familiar with grazing and haying impacts on the Mark Twain National Forest. These specialists are also very knowledgeable in their particular field of expertise including hydrology, ecology, forestry, and wildlife biology. Determining the appropriate level of measure (standard or guideline) was done using the interdisciplinary team of specialists' knowledge and experience as a foundation. In some cases, scientific literature helped the specialists develop the appropriate level of measure as well as the numbers, dates, or other quantifiable criteria specific to standards or guidelines. The level of measure developed is appropriate for ensuring proper management on the National Forest. The specific distances and criteria used in the development of all standards and guidelines are scientifically sound.

PC#300 I - This guideline, along with all resource guidance was discussed at length among the IDT. The determination to make this a guideline was thought to be the best fit for all management activities. It should be noted that while it is a guideline, it must be followed. If it is not going to be followed, the reasons must be discussed in the NEPA document.

PC# 344 - The Mark Twain National Forest should further assess impacts of grazing.
A) Including prohibiting grazing.
B) Including plant cover and diversity.
C) Including scientific data for how information was collected.
D) Including positive impacts such as assisting in the spread of native species.
E) Including discontinuation of grazing in units managed for natural community values.

PC#344 A,B,C - We disagree with this comment. The FEIS documents a thorough analysis of grazing under each alternative. Chapter 3, pages 68, 77, 89, 90, 103-106, 108, 121, 137, 146, 161-164, 166-168, 179-187, 190, 197, 219, 225, 243-245, 247-249, and 262-264, 269-275 are some of the places where effects documentation can be found. The effects

analysis is based on the body of scientific knowledge and professional judgment by ecologists, botanists, and range specialists working on the analysis.

The speed at which ecosystem recovery takes place is based upon many factors such as basal area, species present, and others. These factors are discussed in the DEIS and FEIS. The recovery speed described in the analysis is a referred to as a generality (i.e. much slower) or as a range (i.e. several decades versus 5 to 10 years). These estimates utilize ecological concepts and professional judgment. However, the concepts are referred to in numerous references listed in the EIS. Examples include Packard, S and C.F. Mutel 1997, The Tallgrass Prairie Restoration Handbook for Prairies, Savannas and Woodlands, and Nelson, P.W. 2005, The Terrestrial Natural Communities of Missouri.

PC# 344 D - The Mark Twain National Forest has recognized the fact that the riparian ecosystems are sensitive and are altered from the historic conditions. While reducing the number of openings in these areas, other plants will flourish. Grazers do disturb the soil and in some areas they may help with the germination and spread of seed. In riparian areas, however, this disturbance can increase sedimentation and erosion to the stream courses, decreasing the water quality. While fencing livestock away from streams may produce thickets in some areas, the improvement and protection to the water quality of the area is a benefit that is important to the MTNF. Even if these areas in the short term revert to thickets, they will eventually move toward woody material which is a direction toward the desired condition in many locations. The increase in biomatter will help stabilize the ground and provide better infiltration; reduce runoff, sedimentation, and erosion rates.

PC#344 E- Comment noted.

PC# 378 - The Mark Twain National Forest should continue to allow livestock grazing on public lands.
A) To avoid adverse effects to the local beef economy.
B) To provide the uneven levels of vegetation that are utilized by many wildlife species.
C) Because rotating cattle helps maintain the environment (savanna, glade, Riparian) instead of over grazing or over growth in multifora rose and cedar.
D) Because it is a viable tool to improve resource conditions and reduce wildfire hazards.
E) Because grazers fix fences assisting in excluding unauthorized vehicles.

PC#378 A - The FEIS, Chapter 3, Range section discusses how the range program will remain stable if additional permits are requested. The commitment to offset any losses of AUMs as a result of the 2005 Forest Plan will also be discussed in the Record of Decision.

The FEIS (page 3-274) states that a reduction in available ranges areas will not significantly affect the livestock industry in the 29 county area where the National Forest is located. We understand that some individual permit holders may be affected by the 2005 Forest Plan's management direction to eliminate grazing on glades and woodlands and in riparian areas. For this reason, I have committed to offset animal unit month reductions by authorizing permits on in-active allotments or on new allotments in ecologically appropriate areas.

Page 3-269 – 3-270 of the FEIS discussed the historic influence of buffalo and elk on the ecosystem.

PC#378 B - We disagree. As documented in Chapter 3 of the FEIS (Ecological Sustainability section), restoration of the glade ecosystems, which are now in poor condition due to many years of open grazing and fire exclusion, will best occur without grazing pressure and with the use of prescribed burning. Once restored, the Forest may consider

resuming an appropriate level of grazing on some glade ecosystems. This would require an amendment to the Forest Plan.

PC#378 C,D,E - The 2005 Forest Plan approves properly managed grazing as a viable management tool to maintain open areas on ecologically appropriate sites.

Theme 15.2 - Cool-season to warm-season conversion

PC# 11 - The Mark Twain National Forest should reduce fescue before applying a 30 percent mix of native forbs where nonnative open lands are being converted.

PC#11 - The standard referenced by the commenter establishes an appropriate seed mixture for use in conversion from non-native to native grasslands; it does not establish application requirements. Conversion of open lands from primarily non-native grass species to native grass species would in most cases require site preparation activities prior to over seeding of native grasses. The 2005 Forest Plan does not restrict site managers from proposing those management activities that would best and most efficiently achieve desired conditions while minimizing environmental effects. Managers evaluate current land conditions (whether invasive species, undesirable native species, soil conditions, etc) then develop project activities suited to addressing the site's management problems, including reduction of fescue (or other non-natives) before application of native forb seed. The proposed activities would then be addressed in a site-specific analysis.

General Theme 16 - Transportation System

Theme 16.1 - Road Closures

PC# 115 - The Mark Twain National Forest should remove and decommission existing roads.
A) With emphasis on roads with water crossings and high erosion potential.
B) With emphasis on unclassified roads.
C) In order to convert them to trails for recreation.
D) To protect water quality and riparian zones.
E) That are not essential for safety and the management of fire.
F) To prevent illegal ORV usage.
G) To prevent habitat fragmentation.
H) To limit poaching access.
I) Because there is a road maintenance backlog over $10,000,000 in the Mark Twain National Forest.
J) To include a standard that will give strong protection to the avoidance of fragmentation of habitats.
K) By making logging roads temporary.

PC# 317 - The Mark Twain National Forest should reduce road density.
A) Because the maintenance backlog is too large to maintain all existing roads.
B) Because the entire road system may deteriorate by the time the new Forest Plan expires.
C) To reduce ecological cost.
D) To reduce budgetary costs.
E) To reduce habitat fragmentation.
F) To reduce impacts on wildlife habitat.
G) To reduce erosion.
H) To reduce garbage dumping.
I) To reduce inappropriate off-road vehicle use.
J) To reduce the acceleration of water flow that can result in runoff on roadways.
K) And include all roads within the forest boundaries when calculating road densities.

PC#115 and PC#317 - Unneeded roads under Forest Service jurisdiction will be decommissioned, especially those posing the greatest risk to public safety or unacceptable resource damage (2005 Forest Plan, page 2-42.) The decision to decommission a road will be based upon a site specific project-level roads analysis and environmental assessment. As roads are decommissioned, especially non-system roads, the existing road density in the project area will decrease. Access on roads may also be limited to reduce negative effects to the environment. If there is a need and such use is acceptable within the management area, an unneeded road may be converted to a trail.

Please see Transportation standards and guidelines concerning stream crossings within WPZ or RMZ (2005 Forest Plan, page 2-40 and 2-41.) Fords can occur where limited traffic is expected to occur and minimal disturbance will take place. Mitigations measures include crossing at right angle and allowing the passage of aquatic organisms and large woody debris.

Roads not identified for decommissioning will be maintained with Congressional funding. Roads receiving the most traffic will be given top priority for maintenance. In addition to Congressional sources of funding, commercial users of roads will perform their share of maintenance, especially on lesser traveled roads. See 2005 Forest Plan, page 2-38 and 2-39 for more information.

The overwhelming majority of roads under the jurisdiction of the Forest Service on MTNF (97%) are low-volume, aggregate or native surface roads (FEIS page 3-277). These roads are

typically about 12-20 feet wide and many have complete canopy overhanging the roadway. Most native Missouri wildlife species do not find this type of road a significant barrier to movement; with the possible exception of small amphibians. Some animals use these roads as travel corridors themselves, including endangered species such as the Indiana bat which have been documented foraging along roads of this nature. This type of road does not have nearly the impact on wildlife habitat or movement as does a high-volume, blacktop road, such as a state or federal highway.

The major potential impact on wildlife species from roads in the Ozarks is not fragmentation of habitat, but sedimentation of waterways when road surfaces erode into adjacent waterways. (FEIS pages 3-233 through 3-234). Standards and guidelines for water and soil protection (2005 Forest Plan pages 2-2 through 2-5) and for constructed and temporary roads (2005 Forest Plan pages 2-38 through 2-41) would minimize the potential for soil movement off roadbeds and into waterways.

Theme 16.2 - New Roads

PC# 114 - The Mark Twain National Forest should not build new roads.
A) Including around the St. Francis River.
B) Including the Rock Creek/Dark Hollow area.
C) Because it encourages motorized access.
D) Because unpatrolled roads may result in additional crime.
E) Including evaluation of stream crossings that are no longer needed.

PC#114 - Because the transportation system is largely in place, only a small number of new roads would be added. Due to changing land ownership and lack of easements, new roads may be needed. In addition, where new roads are added to the system, many of them already exist and only needed to be reconstructed. Before a road is added to the transportation system it will be based upon a site specific project-level roads analysis and environmental assessment. In addition, any new road must not conflict with the ROS of the management area it lies within.

Theme 16.3 - Protect Access

PC# 22 - The Mark Twain National Forest should protect the right of public access to the forest.
A) Including access for the off-road community.
B) Because closing public access will increase the number of illegal methamphetamine labs.
C) Including access to Palmer.
D) Including ATV access for the disabled.
E) Because taxpayers should be allowed to use the land they own.
F) Including access for fire control, disease and insect control, pest and predator control, and other activities.
G) Including opening all roads to public use.
H) By designating roads as ATV roads instead of closing them.
I) To provide fire fighting access.

PC#22- Within the boundary of the Mark Twain National Forest are thousands of miles of public roads. Public roads, such as state highways, county roads, and National Forest System roads, provide ample opportunities for motorized access and enjoyment of the Forest.

Any changes in public access to the Forest would be the result of a need for roads or access to achieve management activities, as identified through site-specific analysis. Levels of access opportunities differ by alternative as analyzed in Chapter 3 of the FEIS under the Access and Transportation section pages.

The Mark Twain National Forest has two designated motorized trail systems for ATVs and motorcycles. Chadwick Motorcycle and ATV Use Area has approximately 125 miles and Sutton Bluff Motorcycle and ATV Trail System has approximately 25 miles of motorized trail. In addition, Missouri state law allows counties to issue permits for ATVS to ride on county roads where such counties offer a permit. Where counties permit off-road vehicles, permitted operators can also use open, numbered National Forest System roads within that particular county. The forest is currently conducting a three-year OHV Study to determine the impacts of OHVs on three different sites within the forest. The results of this site-specific study will help the Forest Service determine the social and environmental impacts of OHVs trails.

The Forest Service strives to leave as many National Forest System roads open as possible. Closing or having limited access on a road may be done to protect T&E species, to reduce negative impacts to soil and water, to protect heritage resource sites, meet ROS objectives, reduce maintenance requirements, or for other administrative reasons.

Theme 16.4 - Analysis

PC# 233 - The Mark Twain National Forest should conduct an analysis of the transportation system.
A) Including its impacts on wildlife.

PC# 362 - The Mark Twain National Forest should develop an "ecosystem impact" rating system for the different modes of access on different parts of the forest.

PC# 510 - The Mark Twain National Forest should provide analysis of illegal activities and impact of new roads on those activities.

PC#233, PC#362, PC#510 - Effects of transportation system on the riparian resources can be found in the FEIS on pages 3-232 thru 3-239. Effects of the transportation system on wildlife have also been clarified in the FEIS.

When a site-specific activity is proposed, a roads analysis and environmental assessment will be used to determine the site-specific effects on wildlife and their habitat, soils, vegetation, hydrology, and other resources.

Theme 16.5 - Transportation Standards and Guidelines

PC# 310 - The Mark Twain National Forest should change standards and guidelines regarding Transportation Management.
A) Including trails.
B) Including permitting.
C) Included motorized use.
D) Including access to private property.
E) Including used of pesticides for maintenance of special use roads.
F) Including roads analysis.
G) Including relocation of roads.
H) Including road design to conform to natural contours of the land.
I) Including new construction and reconstruction of roads.
J) Including maintenance of roads.
K) Including temporary roads.
L) Including the removal/decommissioning of unneeded roads.
M) Including new construction and reconstruction of bridges.

PC#310 - Forest Plan standards must be achieved. If a standard isn't met, a Forest Plan amendment is needed for each deviation. Forest Plan guidelines should be achieved in most cases. Guidelines may be deviated from with documentation and rationale. The guidelines

identified for transportation are expected to be followed in most situations; however, the Forest Service is aware of enough exceptions to their implementation that they would warrant leaving them as guidelines.

Special use permits for road access are authorized where adverse environmental effects can be avoided or minimized. Where access to private property can only be made by crossing Forest Service managed lands, the permittee will maintain the road in such a manner as to avoid adverse environment impacts. The Forest Service does not maintain roads for the sole purpose of access to private property.

General Theme 17 - Special Designations

Theme 17.1 - Lower Rock Creek

PC# 1 - The Mark Twain National Forest should carry out restoration activities in the Lower Rock Creek areas.
A) Only if restoration can be done without road building.
B) To protect from off-road vehicles.
C) To protect wildlife.
D) To protect vegetation.
E) To provide balance to the preferred alternative.
F) Including a "semi-primitive roadless" or "wilderness" designation.

PC# 286 - The Mark Twain National Forest should manage areas of Lower Rock Creek as a single wilderness area.
A) Because it provides excellent opportunities for solitude and primitive unconfined recreation.
B) Because it would qualify as a Wilderness area if it is not broken up.
C) Because the Forest Service failed to site any legal authority to break up the area.
D) Because any roads or property lines are outside of the boundary.
E) Including the acquisition of some inholdings.
F) Including a reevaluation of the Roadless Areas in Lower Rock Creek.

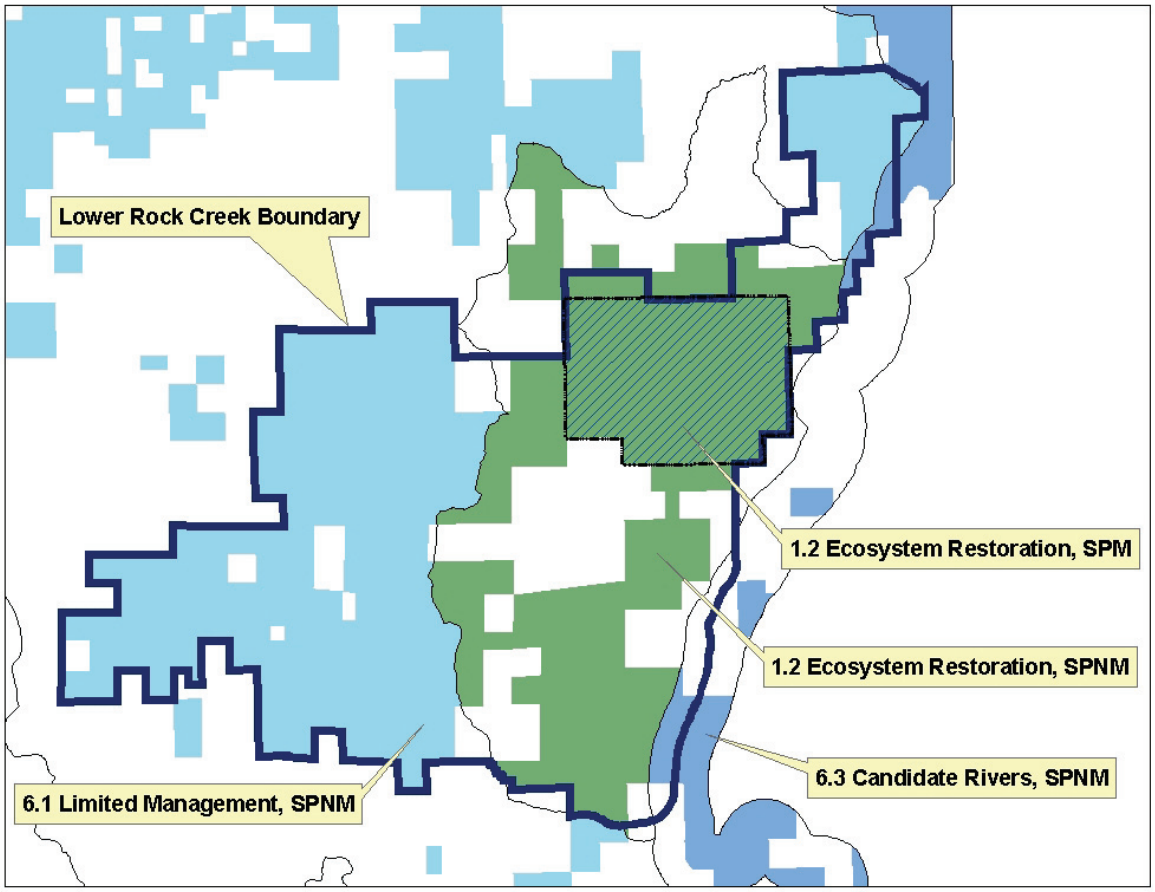
PC# 287 - The Mark Twain National Forest should consider Wolf Hollow as a roadless area.

PC#1, PC#286, PC#287 - The Lower Rock Creek Area is of great interest to groups and local residents. There is disagreement over the appropriate management prescription for this area. Management options for the Lower Rock Creek area were thoroughly analyzed during the plan revision process. In the Draft EIS, Alternatives 1, 4, and 5 allocated the entire Lower Rock Creek area as 6.1 Management Prescription (MP) with a Recreation Opportunity Spectrum as semi-primitive non-motorized (SPNM). Alternative 2 allocated all but 1,345 acres in the extreme NE corner (which remained 6.1 SPNM) of the Lower Rock Creek area as 1.2 MP with semi-primitive motorized (SPM). Alternative 3 recognized the ecological uniqueness of the Lower Rock Creek area with a (roughly) 60-40 split -- 57% of the area in 6.1 MP SPNM and 43% in 1.2 MP (Restoration) SPM. In the Final EIS, Alternative 3 has been changed in response to comments received on the Draft EIS. In the FEIS, the 1.2 MP ROS has been changed to semi-primitive non-motorized (SPNM) with the exception of Wolf Hollow (approximately 1830 acres) which is allocated to semi-primitive motorized (SPM). (Chapter 3 (Wilderness Study Areas and Roadless Areas section and the Recreation section) of the FEIS describes additional information about the analysis and allocations.)

This change is designed to address the concerns through compromise and still meet important restoration of natural community objectives. The 2005 Forest Plan direction emphasizes natural community restoration in this area, which is appropriate due to the ecological conditions. The 2005 Forest Plan direction is a result of a compromise from conflicting user

wants and ecological needs. It will restrict motorized access in most of the area except for the Wolf Hollow drainage where an existing road has been opened on an occasional, seasonally-restricted basis for traditional hunting purposes.

Figure 1 - Treatment of Lower Rock Creek area in FEIS Alternative 3 (Selected Alternative)



The FEIS demonstrates that the Forest took a hard look at the effects of allowing and prohibiting motorized use in Lower Rock Creek. A broad range of alternatives was considered in the search for the "greatest good" for this area. The programmatic management prescription in the Revised Plan does not authorize any new development in the area. Motorized vehicles are prohibited in most of the area. No new development is proposed for the MP 1.2 Ecosystem Restoration (Wolf Hollow) area in Lower Rock Creek. The EIS discloses the effects of motorized use of Wolf Hollow. The 2005 Forest Plan essentially maintains the environmental status quo in the MP 1.2 area of Lower Rock Creek.

Pursuant to the Multiple-Use Sustained Yield Act of 1960, the Forest service has considerable discretion to determine the appropriate use of particular areas of the National Forests, including Lower Rock Creek. Public opinion over the allowable uses of the area is sharply divided, despite efforts by the Forest to facilitate compromise. With that in mind and with resource protection as the touchstone, the Forest forged a compromise between divergent public views. The balanced approach to Lower Rock Creek is a conservation-based compromise. The programmatic disclosure of effects (FEIS, pages 3-288 to 289) indicates that the resources of the MP 1.2 area (Wolf Hollow) will be protected. If monitoring

information reveals that resource conditions are deteriorating, the area can be promptly closed to motorized use to allow restoration.

Table 1 - Treatment of Lower Rock Creek Area by Alternative

	Management Prescription	Acres	Percent of Area	ROS Semi-primitive
Alternative 1	6.1 Limited Mgmt	11,545 ac	100%	Non-motorized
Alternative 2	1.2 Restoration	10,200 ac	88%	Motorized
	6.1 Limited Mgmt	1,345 ac	12%	Non-motorized
Alternative 3 Draft EIS	1.2 Restoration	4,995 ac	43%	Motorized
	6.1 Limited Mgmt	6,550 ac	57%	Non-Motorized
Alternative 3 Final EIS	1.2 Restoration	3,165 ac	27%	Non-motorized
	1.2 Restoration (Wolf Hollow Area)	1,830 ac	16%	Motorized
	6.1 Limited Mgmt	6,550 ac	57%	Non-motorized
Alternative 4	6.1 Limited Mgmt	11,545 ac	100%	Non-motorized
Alternative 5 (1986 Plan)	6.1 Limited Mgmt	11,545 ac	100%	Non-motorized

The Forest completed an exhaustive inventory and evaluation of potential wilderness areas during plan revision. Lower Rock Creek does not qualify as a roadless area or a wilderness area per the criteria found in FSH 1909.12, Chapter 7 (8/3/92). For information about the process, see Appendix C of the FEIS and Chapter 3 Wilderness Study Areas section.

The Lower Rock Creek area was mapped as three separate parcels during a road density mapping analysis. This was appropriate because one of the roadless criteria requires less than ½-mile of improved road per thousand acres. A second analysis using semi-primitive ROS core areas resulted in the Lower Rock Creek area being mapped as four semi-primitive core areas. This was based upon a ½-mile buffer from improved roads. We worked hard at finding all roadless areas and potential wilderness. The Lower Rock Creek area did not qualify. The process we used to inventory National Forest lands for potential wilderness was sound and comprehensive. It is documented in Appendix C of the FEIS.

Theme 17.2 - Wilderness

PC# 5 - The Mark Twain National Forest should designate more areas as either "wilderness" or "semi-primitive roadless" areas.
A) To provide for future generations.
B) To protect Lower Rock Creek.
C) Including the proposal to add 1,570 acres of Wilderness Study Areas to the existing Wilderness Areas.
D) Including the additions to six Wilderness areas as described in the Roadless Area Inventory process.
E) Including Big Spring, Lower Rock Creek, North Fork, Smith Creek, Spring Creek, Swan Creek, Van East Mountain, and additional lands that are adjacent to Wilderness areas.
F) Including an increase in buffer lands around these areas.
G) Including wilderness/roadless areas that include natural processes, habitat ecosystems, old growth large fire resistant trees, and corridors connecting these areas.
H) In accordance with the Federal Wilderness Act.

PC# 150 - The Mark Twain National Forest should not designate any more wilderness areas.

PC#5, PC#150 - The Mark Twain National Forest does not designate Wilderness areas. Parcels of land that meet criteria in FSH 1909.12 chapter 7 are considered in alternatives as recommended to Congress for Wilderness study. This process is discussed in Chapter 3 of the FEIS Wilderness Study Areas and Roadless Areas. Results of the Forest Roadless Inventory are found in Appendix C of the FEIS.

Thirteen parcels of land, totaling about 1,770 acres, meet the criteria for the roadless areas. These parcels are contiguous to existing Wilderness areas and have been recommended as additions to them.

Comments specific to Lower Rock Creek are addressed under Theme 17.1 and Theme 17.6. Many of the expressed public concerns include the management of a shut-in canyon (sometimes referred to as Cathedral or Dark Hollow Canyon) along Lower Rock Creek that is located on private land, outside the jurisdiction of the Forest Service.

Swan Creek, Spring Creek, Smith Creek, Van East Mountain, Big Spring, and North Fork are allocated to Management Prescription 6.1 in all alternatives.

See also Response to Comments for Themes 17.5 and 17.6

Theme 17.3 - Wild and Scenic Rivers

PC# 42 - The Mark Twain National Forest should recommend eligible rivers for wild and scenic river status.
A) Including other rivers withdrawn from Wild and Scenic River eligibility.
B) Including Cedar Creek.
C) And consider that the North Fork of the Black River, in particular, is cited in its evaluation as having "exceptionally high-quality habitat for the Ozark Hellbender."
D) Including recommending more rivers as wild and scenic as part of a major watershed program.
E) Including proceeding with the recommendation of the 16 miles of the Black River.
F) Including the Current River in Ripley County.
G) Including the North Fork of the White River.
H) Including Courtois Creek.

PC#42 - We conducted a review of rivers to determine their eligibility for national designation. This review is described in Appendix E of the FEIS. Any further suitability study of any rivers to be included in the Wild and Scenic Rivers Act would occur in conjunction with the State of Missouri and in response to public demand. Congress makes designation of rivers as part of the national Wild and Scenic Rivers System.

Neither WSRA or NFMA and its regulations require suitability issues to be resolved as part of forest plan revision. Congress has allowed the Forest Service the discretion as to when to conduct suitability analyses. There is no evidence of any violation of law by deferring the suitability analysis for river segments found to be eligible.

Support is noted for inclusion of the Black River in management prescription 6.3 in Alternatives 1-4.

The management of other rivers such as Cedar Creek, Courtois Creek, and the North Fork of the White River would remain the same as in the 1986 Forest Plan even though these streams (or segments of them) may not be classified as eligible for designation. See further discussion in Chapter 3 of the FEIS within the Wild and Scenic Rivers section and Chapter 3 of the 2005 Forest Plan under management prescription 6.3

The 1986 Forest Plan recognized the lower Current River as a Forest Special Area under Management Prescription 8.1 with specific standards and guidelines. This waterway had been previously reviewed and was rejected for National River candidacy. (FEIS for 1986 Forest Plan, Appendix A1 page 43 Comment 56.)

Theme 17.4 - Forest Special Areas and Research Natural Areas

PC# 85 - The Mark Twain National Forest should add Still Spring Cave at Willow Springs, Tucker Bay Spring and the associated sink at Doniphan, and Turner Mill Cave and Spring at the Eleven Point Unit to the list of Forest Special Areas.

PC# 290 - The Mark Twain National Forest should evaluate existing natural areas for designation as Research Natural Areas.

PC#85 PC#290- Commenter gives no rationale for adding these areas to the Forest Special Areas list. *Tucker Bay Spring and Sink* and *Turner Mill Cave and Spring* are managed under Forestwide standards and guidelines for geologic features as well under Management Prescription 8.1 specific standards and guideline for the Eleven Point and Current Rivers since these areas are within the managed river corridor. Still Spring Cave will be managed under Forestwide standards and guidelines for geologic features that have clarified and added protections to karst features. This cave is currently managed to restrict public access.

Areas on the Forest have been evaluated for inclusion as Research Natural Areas and Forest Special Areas as of January 2005. New areas will be added as they are evaluated. If needed, specific standards and guidelines for special area would be developed at the project level and added to the 2005 Forest Plan.

NFMA does not contain any specific direction concerning designation of special areas of Research National Areas. NFMA regulations (36 CFR 219.25) do not contain specific prescriptive direction concerning which particular areas, if any, on National Forests are to be designated as special areas of RNAs. The rule in broad terms simply says that "[p]lanning shall make provision for identification of examples" of important ecological types needed to complete the national network of RNAs. Clearly NFMA and its regulations provide considerable discretion to local decision-makers to determine whether particular areas should receive special designation. The allowable uses and protection provided to an area is a policy choice that has been delegated by Congress to the Forest Service, see Multiple-Use Sustained Yield Act of 1960, 16 U.S.C. Secs. 528-531.

The planning record documents that the Forest have given the areas listed in this comment a hard look with regard to whether they should be given special designation. The programmatic management direction for these areas will ensure that they are adequately protected. Monitoring of resource conditions will reveal any changes in management direction that are needed.

Theme 17.5 - 6.1 MP and Roadless areas

PC# 95 - The Mark Twain National Forest should retain sensitive areas in management prescription 6.1.
A) Including Lower Rock Creek.
B) Including Swan Creek.
C) Including Spring Creek.
D) Because adoption of the 1.2 Management Prescription jeopardizes the primitive, wild, and roadless characteristics of Lower Rock Creek by allowing motorized access, road construction, and other undesirable activities.
E) Including Big Spring.
F) Including areas which satisfy most of the roadless criteria.
G) Including lands in Smith Creek, Van East Mountain, and North Folk.
H) Including Lower Creek.

PC# 119 - The Mark Twain National Forest should either convert 6.1 areas to Wilderness Areas or designate them as a Management Prescription 1.2 area.

PC# 197 - The Mark Twain National Forest should convert the 6.1, semi-primitive non-motorized areas in Alternative 3 to 6.2, semi-primitive motorized area.

PC# 363 - The Mark Twain National Forest should manage potential National Wilderness Preservation System areas as wilderness areas.
A) So they can be recommended to Congress for designation.
B) Including Lower Rock Creek, Spring Creek, Swan Creek, Van East Mountain, Anderson Mountain, Big Springs, Smith Creek, and roadless areas contiguous to the existing seven wilderness areas.
C) To maintain the integrity of it's scenic, biological, and roadless qualities
D) To be consistent with Wilderness designation.
E) Including no timber harvesting, mining, and road building.

PC#95, PC#119, PC#197, PC#363 - An analysis of semi-primitive non-motorized areas and sensitive areas located on the Mark Twain National Forest was completed during plan revision to determine the best management for these lands. All of these areas will continue to be managed under the same 6.1 management prescription that they are currently being

managed under in the 1986 Forest Plan with the exception of one area. This exception area is approximately 4700 acres of the Lower Rock Creek area (G05F-8a and 8b, see Appendix C of FEIS). This exception area is allocated to management prescription 1.2 to emphasize restoration of the unique natural communities found within the ecosystems on this part of the Forest. See FEIS Chapter 3, Ecological Sustainability section, and Revised Forest Plan, appendix A). Also, see response to Theme 17.6 for additional information.

Different parts of the forest are allocated to different recreation opportunity spectrum settings (ROS) in order to provide a variety of recreation experiences. Semi-primitive non-motorized areas are one type of setting and are located throughout the forest.

Under the selected alternative, approximately 86,000 acres or 6 percent of the Forest is allocated to semi-primitive non-motorized (SPNM) recreation. Thus, the planning record demonstrates that an adequate number of SPNM areas are dispersed across the Forest. Some would seek more acres of this type of recreation, some advocate much less. The Forest has examined local conditions and resource information to choose the best balance of land allocations in a multiple use context. Neither NFMA, its regulations, nor Forest Service Handbook guidance mandate a certain level or distribution of semi-primitive recreation or roadless areas. The record documents the hard look the Forest gave to the areas listed in the comment. The process used, and the rationale for interpreting and applying the Handbook to the Mark Twain National Forest, is fully described in Appendix C. The approach to roadless area inventory and evaluation described in Appendix C is consistent with the methodology used elsewhere in the East. Programmatic management direction was developed in the 2005 Forest Plan to protect the unique ecological attributes of these area. While it is clear from the comment that some would prefer more SPNM recreation, or a different array of areas (e.g. those areas specifically listed in the comment), there is no indication that the Forest violated NFMA, failed to properly analyze roadless areas, or provide for SPNM recreation.

See response to Theme 17.6.

Theme 17.6 - Roadless inventory process

PC# 256 - The Mark Twain National Forest should prepare a Draft Supplemental EIS.
A) Because the Draft EIS is inadequate.
B) Specifically regarding the Roadless Analysis in Appendix C.

PC# 288 - The Mark Twain National Forest should conduct a new analysis of potential wilderness areas in a Draft Supplemental EIS.
A) Including Big Spring.
B) Including Lower Rock Creek.
C) Including North Fork.
D) Including Smith Creek.
E) Including Spring Creek.
F) Including Swan Creek.
G) Including Van East Mountain.
H) Including roadless lands adjacent to designate wilderness areas which have become Forest Service property since the designations.
I) Including Anderson Mountain.
J) Because due to lack of following proper procedures, many eligible areas were improperly eliminated.
K) Including Big Creek.
L) Including Irish Wilderness additions.
M) Including interim protection for Big Creek and Anderson Mountain until their wilderness values can be fully assessed.

PC# 289 - The Mark Twain National Forest should address roadless areas in a Draft Supplemental EIS.
A) Including all of the areas the Forest Service is proposing for additions to the existing wilderness areas.
B) Because they have not addressed if the RARE II criteria has been met for Anderson Mountain, Big Creek, Spring Creek, and Swan Creek.
C) Including review of RARE II areas to determine if they remain essentially roadless and undeveloped.

PC#256, PC#288, PC#289 - We respectfully disagree that we used improper procedures. The Forest used a roadless inventory and wilderness evaluation process that followed all agency and regulatory requirements. Appendix C of the FEIS documents this process. The DEIS, FEIS, and supporting project file demonstrate the thoroughness of the inventory and evaluation process. Specifically, roadless areas qualify for placement on the inventory of potential wilderness if, in addition to meeting the statutory definition of wilderness, as per FSH 1909.12 Sec 7.1, they meet one or more of the criteria listed in 7.11, and then also meet criteria listed in 7.11(a) which list criteria for including improvements, and 7.11 (b) which lists criteria for Roadless Areas in the East for areas east of the 100th meridian.

We respectfully disagree with the commenter's interpretation of Forest Service Handbook hierarchy. The hierarchy is evident in the Table of Contents for each chapter within the directives. For the Inventory of Potential Wilderness the hierarchy is as follows:

7.1 Inventory of Potential Wilderness

- 7.11 Inventory Criteria
  - - 7.11a Criteria for Including Improvements
  - - 7.11b Criteria for Roadless Areas in the East
- 7.12 Listing and Mapping Roadless Areas

According to FSH 1909.12, Chapter 7, the Mark Twain NF process consisted of two parts that included 1) data-gathering inventory and 2) an evaluation for parcels of lands identified as roadless. The data-gathering process was used to identify roadless areas that qualify for placement on the inventory of potential wilderness in accordance with criteria found in Chapter 7, section 7.1.

After placement on the Forest Roadless Inventory, the area is then evaluated for its potential as wilderness in accordance with direction found in FSH 1909.12, Chapter 7, Section 7.12.

The Forest used the data-gathering step to determine if RARE II areas are "essentially roadless and undeveloped." These areas, which are included in the Roadless Area Conservation Rule, are discussed in the Introduction to Appendix C, and in Chapters 1 and Chapter 3 of the EIS. In an effort to allow the public to better track those areas throughout the process, the Forest used the RARE II number and name of each area throughout the analysis and documentation. The planning record contains the detailed inventory checklist and maps for each of the areas analyzed.

The inventory and evaluation of roadless areas involves complex methodology and analytical process questions that require considerable technical expertise to resolve. The Mark Twain national Forest worked with regional and national experts to ensure that our approach to roadless area inventory and evaluation was appropriate, given Handbook requirements and local conditions. Considerable effort was made to ensure that the spirit (intent) as well as the letter of the Handbook was understood and satisfied. We considered opposing interpretations of the Handbook submitted during Pan development, but concluded that the letter and intent

of the Handbook was different (as described in Appendix C). Although the Forest's roadless area inventory and evaluation analysis involved complex methodology questions, the approach taken and rationale described in Appendix C is both reasonable and consistent with how other eastern National Forests approached this issue. This approach and methodology reflects the agency's longstanding views regarding roadless area inventory and evaluation.

The Mark Twain NF used the correct version of 36 CFR 219.17 in forest inventory process as indicated in Appendix C.

An alternative to recommend the four RARE II areas as for potential Wilderness study was considered but eliminated from further study as discussed in Chapter 2 of the EIS, Alternatives Considered but Eliminated from Detailed Study.

In summary, the description of roadless areas and the analysis factors used in evaluation them for their potential inclusion in the National Wilderness Preservation System are found in the FEIS Appendix C. Forest Service guidance states that the first step in the evaluation of potential wilderness is to identify and inventory all roadless, undeveloped areas that satisfy the definitions of wilderness found in the Wilderness act Section 2(c) (see also Forest Service Handbook (FSH) 1909.12, Section 7.11) (FEIS, Appendix C, Part 1).

Next the Forest is to identify capability to determine characteristics that make land suitable for wilderness designation, without regard to its availability or need as wilderness (FSH 1909.12, Section 7.21))(FEIS, Appendix C, Part II). Then, identify the availability of those areas determined to be capable for wilderness (FSH 1909.12 Section 7.22)) (FEIS, Appendix C, Part II).

For an area to be recommended for inclusion in the National Wilderness Preservation System, there should first be clear evidence of current or future public need for additional designated wilderness (FSH 1909.12 Section 7.23) (FEIS, Appendix C Part II).

As stated in Chapter 3 of the FEIS, there are thirteen parcels of land adjacent to six designated Wilderness that exhibit some roadless characteristics. Although these areas are each less than 5,000 acres they met criteria 7.11, 2c. Each of these parcels of land has potential to provide additional acres of semi-primitive non-motorized recreational opportunities and are logical expansions of existing Wilderness boundaries.

The selected alternative includes approximately 1,700 acres of wilderness allocations. An alternative considering recommendation of all Inventoried roadless areas mapped in the Roadless Area Conservation Rule FEIS as Wilderness Study Areas was considered but dismissed from detailed study because four of the five areas did not meet minimum Roadless Inventory and Wilderness evaluation criteria due to road management or influence from private land (FEIS, page 2-15). The FEIS documents that the Forest took a hard look at the effects of various levels of wilderness allocation.

Theme 17.7 - General

PC# 359 - The Mark Twain National Forest should avoid additional special land designations.
A) Including old growth habitat.
B) Including wilderness areas.
C) Including wild and scenic rivers.

PC#359 - Refer to Theme 17.2, Theme 17.3, and Theme 8A.2.

General Theme 18 - Recreation

Theme 18.1 - Trails

PC# 23 - The Mark Twain National Forest should establish a recreational corridor for the Ozark Trail.
A) To allow for light selective harvest to maintain the permanence of the treadway.
B) To preserve the integrity of the forest.
C) Including restricting portions of the Trail to foot travel only.
D) To protect the work that volunteers have put forth to make the Trail a reality.
E) Including restricting even-aged management along the Trail.
F) With a minimum width of 100 feet on each side of the trail.
G) To enhance the wilderness experience for hikers.

PC# 242 - The Mark Twain National Forest should provide adequate maintenance for an expanded trail system.

PC# 401 - The Mark Twain National Forest should allow biking and horseback riding trails only on topography capable of withstanding the impact.

PC# 402 - The Mark Twain National Forest should increase hiking opportunities on the Ozark Trail.
A) Including lengthy trails as well as short loop trails.
B) Including continued collaboration with user groups.
C) Including consideration of user group recommendations and guidelines.

PC#23, PC#226, PC#242, PC#401, PC#402 - There were no proposed changes to the management of the Ozark Trail in the 2005 Forest Plan. The trail is managed as sensitivity level 1 travelway as described in Appendix G of the 2005 Forest Plan. In most cases the areas within the viewshed of these trails will be in retention or partial retention. Visual Management for sensitivity level 1 foreground and near foreground are determined at the project level and the design for visual management is found in Chapter 2 of the 2005 Forest Plan. Current management restricts the amount of temporary openings as the result of even-age timber management along all hiking and horse or recreation trails. In Management Prescription 6.1 and 6.2, these temporary openings may not be within 100 feet of the trail. In a project level analysis, visual mitigations may be added along trails that are more restrictive than those listed in the 2005 Forest Plan.

Most trails on lands managed by the Mark Twain NF are open to a variety of uses in an effort to keep the trail tread open and reduce costs associated with managing single use trails. Currently there are no plans to expand non-motorized trail systems. The main route of the Ozark Trail is complete on National Forest land except for a crossing on Courtois Creek. The Forest Service works closely with the Ozark Trail Association and its volunteer trail teams in the construction and maintenance of trail sections. Other owners or agencies manage some segments of the Ozark Trail that are open only to foot travel.

See discussion in response to Theme 1.16

PC# 110 - The Mark Twain National Forest should clarify how hiking and equestrian access will change in the vicinity of the C. Harmon Hollow and Loving Ridge area.

PC#110 - There are no proposed changes from the current management of this area under prescription 6.1, which include a network of trail for non-motorized users. This area is gated and closed to motorized vehicles for most of the year, exceptions being for high water access for adjacent landowners and during modern firearms deer season. (see page 3-35 of 2005 Forest Plan.)

Theme 18.2 - Hunting

PC# 72 - The Mark Twain National Forest should enhance hunting on forest lands.

PC# 73 - The Mark Twain National Forest should restrict hunting on forest lands by establishing sanctuaries.

PC#72 , PC#73 - Hunting opportunities have been analyzed in Chapter 3 of the EIS as a part of dispersed recreation on pages 3-306 through 309. Hunting, fishing and trapping regulations are promulgated and enforced by the Missouri Department of Conservation.

Theme 18.3 - Scenery

PC# 200 - The Mark Twain National Forest should add a goal to achieve high quality scenic values.
A) Because even-aged management and other harvest methods of similar results detract from the potential for achieving local quality visual goals.

PC# 331 - The Mark Twain National Forest should change goals, standards, and guidelines regarding visual management.
A) Including visual quality objectives guidelines as standards.
B) Including variety classes and sensitivity levels.
C) Including Nfg zones.
D) Including elimination of guidelines for short term reduction for central hardwood regeneration or similarly impacting activities.
E) Including not allowing monotonous landscapes.

PC#200 ,PC#331 - Specific standards and guidelines for Visual Management are found in Chapter 2 for Forestwide direction, in Chapter 3 under specific Management Prescription direction, and Appendix G of the 2005 Forest Plan. Visual quality objectives should be met as displayed in the matrix under each management prescription in order to ensure that visible evidence of active management is minimal.

All standards and guidelines were developed by resource specialists familiar with visual impacts or management activities on the Mark Twain National Forest. These specialists are also very knowledgeable in their particular field of expertise including hydrology, ecology, forestry, and wildlife biology. Determining the appropriate level of measure (standard or guideline) was done using the interdisciplinary team of specialists' knowledge and experience as a foundation. In some cases, scientific literature helped the specialists develop the appropriate level of measure as well as the numbers, dates, or other quantifiable criteria specific to standards or guidelines. The specific distances and criteria used in the development of all standards and guidelines are scientifically sound.

Theme 18.4 - Facilities

PC# 228 - The Mark Twain National Forest should construct pull offs for recreational parking, campsite clearings at the beginning of old logging roads, and fire rings to access the forest.

PC# 229 - The Mark Twain National Forest should construct camp clearings and fire rings in backpack trail areas. PC# 373 - The Mark Twain National Forest should consider the challenges of managing non-traditional forest users.
A) Including the requests of ATV riders, mountain bikers, equestrian riders, rock climbers, spelunkers, etc.
B) Because how the Forest Service addresses the requests of these user groups may influence how other public agencies consider similar requests.

PC#228 ,PC#229 - These comments are related to site-specific management concerns or projects. We will continue to cooperate with other land management agencies in the State when considering requests for both traditional and non-traditional recreational uses.

Theme 18.5 - Recreation emphasis

PC# 151 - The Mark Twain National Forest should use isolated tracts as management prescription 7.1 rather than dispose of them.

PC# 154 - The Mark Twain National Forest should encourage the public to recreate in areas other than the forest.
A) Because of its lack of resources to manage the National Forest.

PC# 225 - The Mark Twain National Forest should have a recreational focus for forest management.
A) Including whitewater paddlers' concerns.
B) Including hiking.
C) Including hunting.
D) Including canoeing.
E) Including biking.
F) Including trail-riding.
G) Including equestrian use.
H) Including completion of the national forest portions of the Ozark Trail.
I) Including rethinking the fundamental values of nature-oriented recreation and low impact non-motorized recreation.
J) Because as the population increases, the recreational value will increase.
K) Because the forest should consider its obligations and role for managing recreation areas, and not "farm out" recreation management.

PC# 375 - The Mark Twain National Forest should establish a more balanced distribution of developed recreation areas and maintain existing campgrounds with significant historical preservation value.
A) Because of the increasing demand for developed recreation areas.
B) Because "family-oriented" campgrounds attract a more "desirable" type of forest user.
C) Because it is unclear why the plan includes certain recreation areas and excludes others.

PC#151, PC#154, PC#225, PC#375 - The Multiple-Use Sustained Yield Act of 1960 states, “It is the policy of the Congress that the National Forests are established and shall be administered for outdoor recreation, range, timber, watershed and wildlife and fish purposes.” This means that the National Forests are managed to provide for the use of all the various renewable surface resources in a combination that best meets the needs of the American people. The Revised Forest Plan provides a balance between competing concerns while

managing for biological diversity, off-road vehicles, timber harvest and non-motorized recreation.

As discussed in Chapter 3 of the EIS under Recreation, 99% of the Forest is open to dispersed types of recreation such as hunting and hiking, and provides over 750 miles of trail. All types of recreation offerings and opportunities on the forest are discussed in this section of the EIS.

Recreation areas are developed around a specific feature or recreation offering, such as a stream, lake, or trail. These features are not found within all parcels of land within the Mark Twain National Forest.

Management specific to watershed issues are also found in Chapter 3 of the EIS under Wild and Scenic Rivers and the Riparian Areas, Aquatic systems and Water Quality sections.

See also the response to Theme 18.2.

Theme 18.6 - Recreation Standards and Guidelines

PC# 328 - The Mark Twain National Forest should change standards and guidelines regarding Recreation Management.
A) Including clarification of dispersed and developed recreation uses in context of the Recreation Opportunity Spectrum.
B) Including use of native species for landscaping of recreation areas.
C) Including prohibition of use of tax dollars for trash collection.
D) Including the guideline for site inspection as a standard.
E) Including the guideline for construction near Watercourse Protection Zones as a standard.
F) Including standards for "closed unless marked open" and closing trails.
G) To ensure that they include measurable criteria.
H) Including prohibition of competitive and organized events.
I) Including analysis of the visual resources for quality recreation experiences.
J) Including a discussion of impacts of off-road vehicles.
K) Including construction and maintenance of recreation facilities.
L) Including motorized recreation.
M) Including additional restrictions on development.
N) Including standards that show and set enforceable regulations on off road vehicles, show locations for travel, and prohibit new ORV access points.

PC#328 - All standards and guidelines were developed by resource specialists familiar with the Mark Twain National Forest. These specialists are also very knowledgeable in their particular field of expertise including hydrology, ecology, forestry, and wildlife biology. Determining the appropriate level of measure (standard or guideline) was done using the interdisciplinary team of specialists' knowledge and experience as a foundation. In some cases, scientific literature helped the specialists develop the appropriate level of measure as well as the numbers, dates, or other quantifiable criteria specific to standards or guidelines. The specific distances and criteria used in the development of all standards and guidelines are scientifically sound.

Refer to Appendix F for types of activities and developments within each class of the ROS spectrum. This spectrum goes from more exclusive management on the primitive end to more inclusive on the urban.

See also responses to Theme 22.1, Theme 7.5, and Theme 7.4, PC#135 and Standards and guidelines on page 2-23 and 2-24 of the 2005 Forest Plan.

Theme 18.7 - User Fees

PC# 376 - The Mark Twain National Forest should collect fees from developed campgrounds and not through the expansion of "user" fees.

PC#376 - The Mark Twain National Forest currently has a fee system in place for users of developed recreation areas and motorized trails. Information can be found on the Mark Twain National Forest website, on the All-Terrain Vehicle policy handout, or from District offices. The expansion of user fees is not a forest plan decision.

See also response to PC#92 (Theme 18.8)

Theme 18.8 - Laws and Policies

PC# 92 - The Mark Twain National Forest should eliminate the Recreational Access Tax (RAT).
A) Because it is an intrusion of personal freedom.

PC#92 - The Federal Lands Recreation Enhancement Act (REA) was signed into law on December 8, 2004, as part of the 2005 consolidated Appropriations Act (P.L. 108-447). It replaced the Recreation Fee Demonstration and some of the Land and Water Conservation Fund authorities that enabled agencies to charge fees for the next ten years. The Forest Service and Department of Interior agencies have developed a common understanding and consistency in implementation of the REA. Compliance with this legislation is not a Forest Plan decision; rather it is under the agency directives system of Forest Service Manuals and Handbooks. The Forest Service must abide by and comply with existing Federal laws and regulations.

General Theme 19 - Heritage Resources

Theme 19.1 - Heritage Resources

PC# 250 - The Mark Twain National Forest should increase historic preservation projects.

PC# 320 - The Mark Twain National Forest should review standards and guidelines regarding Heritage Resources.
A) Including not publicizing where they are located.
B) Including eliminating ATV use.
C) Including areas listed on the National Register for Historic Places.

PC# 395 - The Mark Twain National Forest should develop annual procedures to remove and monitor encroaching vegetation now surrounding the Greer Mill building.

PC#250, #320, *PC#395* - Nothing in the 2005 Forest Plan would change historic preservation projects. The Mark Twain National Forest continues to work to gain funding for these projects.

See discussion in Chapter 3 of the EIS under Heritage Resources concerning these comments.

All standards and guidelines were developed by resource specialists familiar with the Mark Twain National Forest. These specialists are also very knowledgeable in their particular field of expertise including hydrology, ecology, forestry, and wildlife biology. Determining the appropriate level of measure (standard or guideline) was done using the interdisciplinary team of specialists' knowledge and experience as a foundation. In some cases, scientific literature helped the specialists develop the appropriate level of measure as well as the numbers, dates, or other quantifiable criteria specific to standards or guidelines. The level of measure developed is appropriate for ensuring proper management on the National Forest.

The specific distances and criteria used in the development of all standards and guidelines are scientifically sound.

Theme 19.2 - Tribal Concerns

PC# 74 - The Mark Twain National Forest should ensure that if any items falling under Native American Graves Protection and Repatriation Act (NAGPRA) are uncovered during construction, the construction should stop immediately, and state and tribal NAGPRA representatives contacted.
A) Including the Eastern Shawnee Tribe

PC#74 - As stated on page 2-27 of the 2005 Forest Plan, the Mark Twain will consult with Native American groups who may have a potential interest in any sites that may be found within the forest boundary, this includes the unintentional discovery of human remains. It has been noted the Eastern Shawnee Tribe has an interest in being notified.

General Theme 20 - Social Impacts

Theme 20.1 - Social impacts

PC# 514 - The Mark Twain National Forest should consider whether or not there is enough information to determine the age group responsible for human population growth.
A) Because the effects it may have on the demand for forest related jobs and recreation.

PC#514 - Additional analysis has been added to the FEIS

General Theme 21 - Economic Effects

Theme 21.1 - Economic Effects

PC# 8 - The Mark Twain National Forest should allow more resource production within the forest.
A) To benefit rural economies.
B) To help fund the Forest Service.
C) To reduce importing materials from countries that may or may not have considered environmental impacts.
D) Because it has been part of local culture for generations.
E) Including providing for resources that are not provided on private lands.

PC# 18 - The Mark Twain National Forest should not use taxpayer dollars to sell wood chips to China.
A) Because the cost is not recovered.

PC# 103 - The Mark Twain National Forest should redirect money lost on the timber sale program to employ local individuals in non-commercial restoration activities.
A) And disclose how much taxpayer money is lost on the commercial timber sale program and how the budget of the Mark Twain is affected by this program.

PC# 202 - The Mark Twain National Forest should consider the economic impacts of federal land timber harvests on local forest owners.

PC# 340 - The Mark Twain National Forest should consider that the economic analysis is inadequate.
A) Because it ignores the reality of how much money is lost harvesting timber from the Mark Twain.
B) Because it grossly overestimates the number of timber harvest jobs and greatly underestimates the number of recreation jobs on the forest.

C) Including the impacts of timber harvest on recreation and the Economic Stability of Local Communities.

PC# 403 - The Mark Twain National Forest should consider the social and economic values of the forest.
A) Including maximizing net public benefits, and consideration of non-market values.
B) Including scenic, aesthetic, and cultural values.
C) To address potential damages caused by timber harvest and mining operations.

PC#8, PC#18, PC#103, PC#202, PC#340, PC#403 - The range of alternatives analyzed in the EIS provide for different levels of resource production within the EIS, Chapter 2. The selected alternative 3 is a balance of conserving plants and animals while sustaining healthy ecosystems. Table 76 displays the differences by alternatives for total jobs and incomes as well as by individual forest management activity. The Economic Effects analysis of Alternative 1 found in Chapter 3 of the FEIS displays direct effects of the elimination of commercial timber harvests from lands within the Mark Twain NF. Forest Service expenditures for management of the Mark Twain National Forest are displayed by alternative in Table 76. These expenditures include funds for timber management, and, as a result, costs for harvesting timber from the Forest are included in the economic analysis. The forest management category produces the most job and income of all except for minerals. Whether dollars are spent on timber management or restoration activities, the only change in local jobs might be in income if wage rates are different.

Budgeted funds specifically for timber management are found under the timber category. In this manner, any money spent on harvesting timber from the Forest is included in the economic analysis.

The Mark Twain is the single largest ownership of forestland in Missouri, representing approximately 10% of the forestland. Data from the Forest Inventory and Analysis (FIA) Timber Product Output Database shows that in 1996 the Mark Twain provided 5% of the total timber product produced in the State of Missouri, while other public lands provided 3.4%. The private forest industry provided 4%, and other private ownership provided over 87%. In light of the fact that the Mark Twain provides approximately 5% of the total timber product produced in the State, the charge that extraction of timber from the Mark Twain NF would force private landowners out of competition is unrealistic. As noted in Table 68, Forest Management jobs are only 1% of the total jobs and 1.5% of the income within the Economic Impact Area of the Mark Twain National Forest. The Economic Effects section discusses the overall effects of forest management across southern Missouri and that specific counties may feel the effects of change to a greater degree than other due to a lack of economic diversification.

In addition, this section of the FEIS discusses the types of employment found within the Economic Impact Area, methodology used in the economic analysis, display resulting changes in both jobs and income by alternatives. Also, Appendix B goes into details of sources used for input into the IMPLAN and FEAST models. The amount of recreation use, actual and projected, within the Forest is discussed in detail in the FEIS Economic Effects section under the Data Background heading.

The FEIS considers the long-term values associated with both using and protecting forests. The values considered are both economic (market or assigned values) and non-priced (social and ecological). Economic efficiency, which considers forest program costs, market-based values (revenues received directly), assigned values (activities such as hiking, fishing, wilderness use), and non-consumptive wildlife uses (bird watching, photography), were analyzed in the EIS. In addressing some non-market values, the economic analysis

incorporated the Resource Pricing and Valuation Procedures for the Recommended 1990 RPA Program.

A discussion of these factors and Present Net Value (PNV) are found in Appendix B of the EIS under the Social and Economic Resiliency Analysis. The PNV is also discussed in the Record of Decision. This economic analysis was conducted in accordance with the National Forest Management Act, and the Council of Environmental Quality procedures for implementing the National Environmental Policy Act (40 CFR 1500-1508). These regulations do not mandate that every public benefit or environmental protection measure be quantified with a monetary value.

PC# 8E - Goals 1.1, 1.3, 1.4 and 2.11 (2005 Forest Plan pages 1-1, 1-2, 1-3, and 1-6) describe the Forest Service's intent to carefully manage the Mark Twain National Forest to provide large blocks of forested land composed of healthy, functioning ecosystems and site-appropriate natural communities, with all the associated plant and animal species. The cumulative effects discussions for each resource recognize the importance of the Mark Twain National Forest as a large segment of public land, while recognizing the fragmented pattern of National Forest ownership (from about 17% on the Cedar Creek Unit to almost 70% on the Eleven Point Unit).

PC# 93 - The Mark Twain National Forest should replace Payment in Lieu of Taxes (PILT) with a new policy of National Forest tax payment to local counties similar to tax payments made on similar land and similar economic activity within the county.

PC#93 - Congress determines the manner in which funds are released to States in lieu of taxes for all federal agency lands. A discussion of payments made to counties through state governments is found in Appendix B of the EIS. Past analysis has shown that in some (Phelps and Madison) Missouri counties combined federal payments exceed property taxes collected on private forestlands.

General Theme 22 - Special Uses

Theme 22.1 - Special Uses

PC# 12 - The Mark Twain National Forest should add an herbicide section on utility ROW 2-31 and 32, as worded in the section under Pesticide use on page 2-19.
A) To help utility companies cost-effectively maintain native grassland under their lines or over their gaslines.

PC#12 - Pesticide use standards and guidelines found on page 2-19 and 2-20 of the 2005 Forest Plan relate to all lands including utilities rights of way unless prohibited under a specific management prescription. Herbicides are a type of pesticide. The Forest Plan does not prohibit their use within utility rights-of-way.

PC# 19 - The Mark Twain National Forest should clarify what permits or other requirements are necessary if a running race were to be planned within the Mark Twain Forest.

PC#19 - Requirements for a specific recreational event special use permits are covered not only within the Forest Plan but also the Forest Service Directives system in FSH 2709.11

PC# 46 - The Mark Twain National Forest should allow competitive speed events on forest roads.
A) Because it is the most logical place as there are few residents in the national forest.

PC#46 - Many roads used for some events are now under easement to individual counties. The Mark Twain National Forest has seen an increase in use of its arterial roads and

neighboring developments in the last ten years. Though density may be lower than paved roads or other parts of Missouri there are impacts to local residents, forest users and law enforcement agencies when roads are closed for races. Direction is also found within FSM 2300 in regard to speed events.

PC# 104 - The Mark Twain National Forest should allow apiaries on forest land.
A) To aid in the pollination of wild plants.

PC#104 - The 2005 Forest Plan does not prohibit the use of apiaries within the Mark Twain. A specific request to place apiaries on National Forest System lands would be evaluated on a site-specific, case-by-case, basis.

PC# 121 - The Mark Twain National Forest should clarify the reasoning behind burial of power lines.

PC#121 - Burial of utility lines are a part of visual management of the scenery resources of the Mark Twain National Forest.

PC# 333 - The Mark Twain National Forest should review standards and guidelines regarding Special Uses.
A) Including when they should be permitted.

PC# 334 - The Mark Twain National Forest should review standards and guidelines regarding Research.
A) Including permits for collections.

PC# 335 - The Mark Twain National Forest should make standards of the guidelines regarding Utility Transmission and Distribution Line Corridors.
A) Including burial of lines.
B) Including Rights of Way.

PC#333, 334, 335 - All standards and guidelines were developed by resource specialists familiar with the Mark Twain National Forest. These specialists are also very knowledgeable in their particular field of expertise including hydrology, ecology, forestry, and wildlife biology. Determining the appropriate level of measure (standard or guideline) was done using the interdisciplinary team of specialists' knowledge and experience as a foundation. In some cases, scientific literature helped the specialists develop the appropriate level of measure as well as the numbers, dates, or other quantifiable criteria specific to standards or guidelines. The specific distances and criteria used in the development of all standards and guidelines are scientifically sound.

Theme 22.1 - Non-timber products

PC# 107 - The Mark Twain National Forest should conduct an analysis of non-timber forest products and their traditional and continuing use by local families for food, medicine, and income.
A) Including affected species.
B) At the project level.
C) Including edible and medicinal plants.
D) Because they have economic and cultural value.
E) Such as nuts, medicinal herbs, and mushrooms that could be harvested in sustainable ways.
F) Such as transevaporation, flood control, purification of water, recycling of nutrients and wastes, production of soils, carbon sequestering, pollination, and natural control of pests.
G) To have a clear understanding of how such resources can be collected in sustainable ways.
H) To determine the impact of other forest management activities on such resources.

l) And establish targets and techniques for recording and monitoring all non-timber forest species.

PC# 247 - The Mark Twain National Forest should add a goal to develop and implement rules and regulations regarding the extraction, removal, and/or harvest of non-timber forest products to insure the protection and self-sustainability of all populations of algae, herbs, fungi, lichens, invertebrates, non-game wildlife, et al.
A) Because recent reports of the theft of commercial quantities of various mosses and lichens in the eastern US are indicative of what may be in the future of the Mark Twain National Forest.

PC#107, PC#247 - The use of forest products other than timber is not a large market segment within the Mark Twain National Forest. Incidental gathering of forest products such as berries, mushrooms, vines and other plants are considered a recreational use of forest lands. Such activities are included with recreation management activities shown in Table 76, in the economic analysis of the FEIS. Benefits to local economies could be in any one of a number of Industry Sectors reported in Table 77.

A number of laws and regulations govern the digging or taking of plants or plant parts in Missouri. Public lands in Missouri are managed by a number of agencies, from county to federal levels of government. Restrictions on digging or taking of plants vary, though most agencies prohibit the digging or taking of plants. The Forest Service allows this activity with a permit for personal consumption only; commercial collection is prohibited. No collecting is allowed within Wilderness Areas.

The majority of these comments specifically concern analysis at the project level not at the programmatic of forest plan level of decision.

See also the response to comments concerning Theme 21.1, Theme 7.4 and Theme 7.9

General Theme 23 - Off Highway Vehicles (OHV)

Theme 23.1 - Volunteers for OHV

PC# 21 - The Mark Twain National Forest should work with private clubs.
A) To improve public access.
B) To open more trails and roads to motorized access.
C) To help with the clean up and maintenance of trails within the forest.

PC# 32 - The Mark Twain National Forest should consider the time and effort that the off-road community has spent cleaning up the forest and marking trails.

PC# 38 - The Mark Twain National Forest should consider outside based sponsorship and/or management of specific trails for motorized use.

PC#21, PC#32, PC#38 - Nothing in the 2005 Forest Plan would preclude the use of private clubs or other groups or organizations working as volunteers or sponsors in a variety of management activities. The Mark Twain National Forest continues to work with organized groups for sponsorship and maintenance of all trails, including motorized ones within the Forest.

Theme 23.2 - Allow OHVs

PC# 24 - The Mark Twain National Forest should adopt an "open" unless posted "closed" policy for roads and trails.
A) To provide controlled areas for legal vehicle use.
B) Because such a policy would be easier to enforce.
C) To avoid ambiguity.

D) Because some trails could provide valuable access in the event of a forest fire or other emergency.
E) In combination with continued OHV studies.
F) Because they should be available for local use.

PC# 240 - The Mark Twain National Forest should allow motorized recreation.
A) Because motorized recreation is a legitimate use of national forests.
B) Because the 20 miles of OHV trails around Sutton's Bluff falls short of meeting the needs of motorized trail users.C) To facilitate access for the disabled.
D) To accommodate demand and protect the local economy

PC#24, PC#240 - The Mark Twain National Forest currently allows limited motorized use through what is commonly called “closed unless posted open”. An alternative that would change to an "open unless posted closed" policy was considered but eliminated from further study as discussed in Chapter 2 of the EIS, Alternatives Considered but Eliminated from Detailed Study.

There are no proposed changes at the programmatic level concerning cross-country use by off-road vehicles within the lands managed by the Forest Service in Missouri. National Forest Service is considering changing national policy to a “closed unless posted open policy” similar to the one currently on the Mark Twain.

Theme 23.3 - Restrict OHVs

PC# 25 - The Mark Twain National Forest should limit or consider limiting motorized access to the forest.
A) To prevent animal and plant poaching.
B) Including a strict ten miles per hour speed limit.
C) To prevent noise pollution.
D) To prevent environmental damage.
E) Including closing the forest to all vehicles if there are insufficient enforcement resources available.
F) Including in eastern portions of Lower Rock Creek area.
G) To prevent timber removal.
H) To protect habitat.
I) Including limiting vehicle use to specific times of year and for specific purposes.
J) Including keeping the Lower Rock Creek area at 6.1 designation.
K) Because of damage caused by ATVs.
L) And provide education and better enforcement.
M) Including designated areas for specific purposes.
N) To provide protection for private property.
O) Including educational efforts to prevent excuses of ignorance of law.
P) To 5 percent of the area.

PC# 63 - The Mark Twain National Forest should limit access to the forest.
A) To primarily non-motorized travel.
B) To allow for the greatest number of people to enjoy a truly natural setting.
C) To protect ecosystem integrity.

PC# 109 - The Mark Twain National Forest should keep the "closed" unless marked "open" policy.
A) In addition to increased law enforcement and penalties.

PC# 135 - The Mark Twain National Forest should prohibit off-road vehicle access to the forest.
A) To prevent ecological damage.
B) To prevent user conflicts.
C) Because of their impacts on wildlife.

D) Because their presence converts areas to single use.
E) At Hazel Creek Campground, Brazil Creek Campground an the vicinity of Parole Lake, Palmer Lake and Howell Lake.
F) Because a complete prohibition will make it easier to enforce.
G) To reduce soil erosion.
H) To reduce noise in the National Forest.
I) To reduce unnecessary expenses to our government.
J) For future generations to enjoy the forest.
K) At Lower Rock Creek.
L) Because the Agency does not have adequate law enforcement to regulate it.
Q) To protect fens for the Hine's Emerald Dragonfly.
R) Because they lead to increased erosion.
S) Because it is in conflict with ecosystem integrity.
T) Including restrictions on access to tailings dams.
U) Because of the impacts on water quality.

PC#25, PC#63, PC#109, PC#135 - As discussed under Theme 23.2, there are no proposed changes at the programmatic level concerning the use of off-road vehicles within the lands managed by the Forest Service in Missouri. Both 1986 and 2005 Forest Plans prohibit the use of motorized vehicles off roads, off designated trails and outside designated areas. This is referred to as a "closed unless posted open" policy. See 2005 Forest Plan page 2-24 for specific management direction.

Under Alternative 1, the Forest Service would need less motorized access for commercial timber activities. Many of the maintenance level 2 roads would no longer be for needed for long-term access. As a result, fewer of these roads would be usable or open to public use. Miles of maintained National Forest System road would decrease, resulting in reduced motorized access including motorized recreational activities like viewing scenery and driving for pleasure. More discussion on this topic is found in Chapter 3 of the EIS under Environmental Consequences of Alternative 1 under Access and Travel Management. Less than 5 percent of the Forest is used for designated trails and play areas. The trail corridors at both Sutton Bluff and Chadwick total less than 70 acres.

A complete discussion and comparison of recreation in Chapter 3 of the FEIS under Recreation section specifically Recreation Opportunity Spectrum and Appendix F, which describes the Recreation Opportunity Spectrum inventory.

In fall 2004, San Dimas Research and Technology conducted research on the effects of different types tires used by a variety of motorized vehicles within the Sutton Bluff Trail System. A report of finding has not been completed.

Theme 23.4 - Enforcement of OHV

PC# 156 - The Mark Twain National Forest should develop consistency in its law enforcement policies.

PC# 157 - The Mark Twain National Forest should make enforcement of the current policy on off-road vehicle use a priority.
A) Because of the destruction they cause to the environment.
B) Including electronic monitoring of off-road vehicles such with the use of solar batteries and video cameras.
C) To reduce user conflicts.
D) Including an increase in funding to meet the need.
E) Including the Chadwick and Sutton Bluff areas.
F) By prohibiting ORVs at Sutton's Bluff.

PC# 241 - The Mark Twain National Forest should require effective mufflers on four wheelers.
A) And restrict their use paved and main graveled forest roads.

PC# 253 - The Mark Twain National Forest should address the problem of uncontrolled motorized recreation.
A) Because current trail and road closures are not working.
B) Because riders under 16 years old are not regulated.

PC#156, PC#157, PC#241, PC#253 - Effects of motorized use within the Mark Twain National Forest is discussed in Chapter 3 of the EIS under Social Effects, Affected Environment for Access and Transportation Management. The 2005 Forest Plan continues to provide direction for a consistent, enforceable Forestwide policy that addresses the needs of OHV users, prevents unacceptable resource damage, and minimizes conflicts with other recreation activities. Law enforcement issues such as the enforcement of regulations and fines are not Forest Plan decisions. Law Enforcement is an administrative procedure, separate from the land management planning process, which follows existing statutes, regulations, and Forest Service Policy (FSM 5302, 5309.11 and others).

Under Missouri Statues, ATVs are required to have an adequate muffler system, along with equipment listed in the Mark Twain National Forest All-Terrain Vehicle handout and Missouri State Highway Patrol's ATVs: Safety Comes First brochure.

Riders of all ages are regulated by the Missouri Statues 304.013, 307.198, and 301.705.

Theme 23.5 - ATV Study

PC# 29 - The Mark Twain National Forest should continue the off-road vehicle study.
A) To allow continued off-road vehicle use.
B) Including in the Palmer Lake area.

PC# 37 - The Mark Twain National Forest should designate off-road vehicle trails.
A) Including in the Palmer-Potosi District.
B) Including in the Poplar Bluff area.
C) Including gravel roads and wagon roads.

PC#29, PC#37- Nothing within the 2005 Forest Plan affects the continuation of this site-specific survey project. The off-road vehicle study decision is outside the scope of the Forest Plan revision and subsequent Record of Decision.

A decision to add more off-road vehicle trails is a project level or site-specific decision, while the Revision is a programmatic decision. The differences between the two types of decisions are discussed within the FEIS in Chapter 3 page 3-1 and 2005 Forest Plan Preface page 1.

Theme 23.6 - Suitable Locations

PC# 36 - The Mark Twain National Forest should put off-road vehicle and horse trails on old timber harvesting and jeep trails in the timber conservation areas that have no fragile ecosystems.
A) To avoid user conflicts with hikers.

PC# 254 - The Mark Twain National Forest should contain off-road vehicles to areas where all other resources may be expendable.
A) With the exception of USFS staff related to public safety, resource management, monitoring and protection and those entities under formal contract with the US government where such use is authorized in the contract.

PC#36, PC#254 - A decision to add more off-road vehicle trails, as well as the specifics of where and when, is a project level or site-specific decision which is not a part of the 2005

Forest Plan decision. This is the type of information forest specialists consider when evaluating site-specific projects related to trail locations. Nothing in the 2005 Forest Plan would prevent the suggested analysis. Standards and guidelines within the 2005 Forest Plan will assist managers in project design.

Theme 23.7 - OHV Permits

PC# 34 - The Mark Twain National Forest should establish a permit or fee-based system for off-road vehicle usage.
A) To cover trail expenses.
B) To fund management and enforcement.

PC#34 - The Mark Twain National Forest currently has a fee system in place for users of designated trail systems. Approximately 85% of these revenues are used by the Forest to operate, maintain, and improve motorized trails and adjacent campgrounds. Additional information can be found on the Mark Twain National Forest website, on the All-Terrain Vehicle policy handout, and at District offices.

Theme 23.8 - OHV Communications

PC# 20 - The Mark Twain National Forest should post a list of trails open to off-road vehicles on the Mark Twain website.
A) Because some off-road vehicle users have to travel a great distance to enjoy their hobby.
B) To prevent confusion created by missing trail signs.

PC#20 - This information is currently available on the Mark Twain National Forest website. In addition, the policy on ATV use is also found on the website under the subject headings of Recreation and Regulations.

General Theme 24 - Minerals Management

Theme 24.1 - Prohibit mining

PC# 70 - The Mark Twain National Forest should prohibit mining in the Mark Twain National Forest.
A) Including the Irish Wilderness area on the Eleven Point River.
B) Including specific areas such as Big Spring, Viburnum Trend, and Winona.
C) Because of the pollution it causes.
D) Because of the impacts to human health.
E) Because of the impacts to karst geology.
F) Including gravel mining.
G) Because of the impacts to wild bird populations.
H) Because it leads to new roads.
I) Including drilling.
J) Unless there is a valid national emergency.
K) Including land swaps to facilitate mining.
L) Including the Ozarks.
M) And provide clarification of what "complementing other resource management objectives" means.
N) Because of impacts on soils.
O) Including lead mining.
P) Including differential treatment of companies.
Q) Because it is an international problem.
R) To protect water quality.
S) Because it could potentially lower water levels.

T) To minimize the negative impacts on forest health and ecosystem sustainability.
U) Because mining's benefits do not outweigh its drawbacks.
V) Because of the impact on scenery.
W) Because of negative economic impact.
X) Because minerals can be found elsewhere.
Y) Because it places a large enforcement/safety burden on the Forest Service and local governments.
Z) Because it is incompatible with the philosophy of multiple use.
AA) Because of international concerns about lead mining.

PC# 223 - The Mark Twain National Forest should consider that Doe Run's lead mining is contrary to the Multiple Use Sustained Yield Act of 1960, 16 USC Sec 59.

PC# 224 - The Mark Twain National Forest should remove mineral development from scenic rivers areas.
A) Because the benefits of protecting forest resources outweighs the short term benefits of mining.
B) Because the destructive effects of lead mining in the Viburnum Trend is insufficient.

PC#70, PC#223, PC#224 - An alternative to restrict or prohibit mineral activity within the Forest or within a specific area of Forest, such as the Eleven Point National Scenic River, was considered but eliminated from detailed study (FEIS page 2-16). Decisions regarding lands available for mineral development are not within the scope of Forest Plan decisions to be made. The Federal Government's policy for minerals resource management is expressed in the Mining and Minerals Policy Act of 1970: to "foster and encourage private enterprise in the development of economically sound and stable industries, and in the orderly and economic development of domestic resources to help assure satisfaction of industrial, security, and environmental needs."

The Bureau of Land Management (BLM) has responsibility and authority over federally owned minerals (including those underlying National Forest System lands) by direction in the President's Reorganization Plan No. 3 of 1946, which transferred the functions of the Secretary of Agriculture with respect to permits for hardrock minerals (lead, zinc, copper, etc.) on acquired Weeks Law lands to the Secretary of Interior. However, administrative responsibility for surface resources remains with the Secretary of Agriculture. The Forest Service is responsible for the administration of surface resources on the Mark Twain National Forest.

The Mineral Resources on Weeks Law Land Act of March 4, 1917, authorizes mineral prospecting on lands acquired by Weeks Law Act authority. Almost all Mark Twain National Forest lands were acquired by Weeks Law Act Authority. The only lands not available for mineral exploration are those excluded by legislative or administrative withdrawal, such as Wilderness, administrative sites, and recreation sites.

Forest Service policy is to administer its mineral program within the overall context of the principles of ecosystem management. The Forest Service administers its minerals program to provide commodities for current and future generations commensurate with the need to sustain the long-term health and biological diversity of ecosystems. The 2005 Forest Plan standards and guidelines (pages 2-34 through 2-37) were developed to protect surface and subsurface resources and minimize potential adverse impacts if/when mineral exploration or development on MTNF lands is permitted by BLM.

Theme 24.2 - Allow mining

PC# 118 - The Mark Twain National Forest should make mining available on all lands in which companies have interest.
A) Because the Draft Forest Plan will be detrimental to mineral exploration and development.

PC#118 - We respectfully disagree that the 2005 Forest Plan would be detrimental to the exploration and development of minerals. Minerals management was identified as one of the areas not needing change from the 1986 Forest Plan, and the only changes made to existing standards and guidelines were editorial. There were a few standards and guidelines added to other resource areas to afford additional protection for sensitive resources, but none that would substantially change the way minerals are managed on the Mark Twain National Forest. See also response to Theme 24.1.

Theme 24.3 - Minerals Management Standards and Guidelines

PC# 336 - The Mark Twain National Forest should change goals, standards, and guidelines regarding Minerals Management.
A) Including prohibition of lead mining.
B) Including requirements to minimize surface excavations.
C) Including reclamation.
D) Including permits.
E) Including Hardrock Leasable Minerals.
F) Including Common Variety Mineral Materials.
G) By making goal 2.5 more specific concerning the need to protect water quality and aquatic habitats.
H) To protect water quality.
I) To protect biodiversity.
J) To protect populations of conservative biota or synecological integrity in any sites identified as having global ecological significance.
K) Because the Forest Service do not have the authority to reject a Preference Right Lease based upon "mineral values" once the Bureau of Land Management has determined that a "valuable deposit" has been made.
L) Including prohibition of drilling.
M) To acknowledge that the public has not been given an opportunity to revisit the issue.
N) By addressing types of mining other than lead such as zinc, copper, and silver.

PC#336 A, B, C, D, H, I, J, L, M - See response to Theme 24.1.

PC#336 E, F - Standards and guidelines were developed by the ID team, considering a wide variety of factors. We believe that the combination of standards and guidelines as written provides managers the flexibility to reach the goals and objectives of the Plan, while protecting sensitive resources and ensuring long-term sustainability.

The intent of this guideline is to allow removal of sand or gravel from the RMZ when there are immediate and local safety concerns or concerns for local infrastructure (such as a bridge about to fail). We believe that Forest Service employees have the ability to apply the standards and guidelines in a reasonable and rational manner.

PC#336 K - We believe there is some confusion about the intent of the standard referred to by the commenter. We agree that the Bureau of Land Management is the agency responsible for regulation of federal minerals, including those that may occur beneath the Mark Twain National Forest, and is the agency that determines that a “valuable deposit” has been discovered. However, the Forest Service is responsible for protecting the surface resources of

the Mark Twain National Forest. A request involving significant surface impacts that did not include a determination that a "valuable deposit" was present would not be considered.

While BLM is the agency that issue leases and permits, they do so with the consent of the Forest Service. All decisions regarding mineral activity on MTNF lands are made on a site-specific basis after thorough analysis and documentation of potential impacts. The Forest Service could withhold consent for a lease or permit if site-specific analysis showed that mineral activities would have significant impacts on surface resources that could not be mitigated.

PC#336 B - The intent of this standard is to keep excavation to a minimum, and not allow complete leveling of an otherwise sloped site to accommodate a drill site in the 1.2, 6.1 and 6.2 Management Areas, where semi-primitive recreation experiences are a primary objective. However, we agree with the commenter that the wording could be changed, and in the 2005 Forest Plan reads "Minimize excavation at drill sites."

PC#336 N - The commenter is correct that there are other minerals extracted from under MTNF lands, such as zinc, copper and silver. However, lead is the primary mineral extracted, and for simplicity, the table identified the leases as "lead leases". The intent of the table on page B-23 of the 2005 EIS is to show the amount and distribution of money derived from mineral development.

PC#336 H, G - See Response to PC# 278 F (Theme 2.3).

PC#336 G - The Forest Service believes the standards and guidelines for protection of water quality and special features (2005 Forest Plan pages 2-2 through 2-5 and 2-11 through 2-18) provide the type of protection for aquatic habitats advocated by the commenter.

PC# 500 - The Mark Twain National Forest should require that new mining facilities shall not release toxic materials into the air, water, or karst formations.

PC#500 - Mining facilities are not regulated by the Forest Service. The Bureau of Land Management is the federal agency responsible for permitting and regulating mining facilities. The Forest Service is responsible for surface management of National Forest System lands, and as such, may require stipulations be placed on permits for exploration or development on National Forest lands. The standards and guidelines described on pages 2-34 through 2-36 of the 2005 Forest Plan are designed to prevent or minimize adverse impacts to all natural resources as a result of any permitted exploration or development activities.

Theme 24.4 - Effects of Mining

PC# 360 - The Mark Twain National Forest should focus its resources and efforts on reducing and eliminating the polluting effects of past mining.
A) Including the damage lead mining has caused in the Viburnum Trend.
B) In karst regions.
C) To protect human health and wildlife.
D) Including analysis of past mining activities.

PC#360 Mineral management policy was not identified as one of the items needing change from the 1986 Forest Plan to the 2005 Forest Plan. See also Response to PC#70 (Theme 24.1) and PC# 118 (Theme 24.2)

Standards and guidelines contained in the 1986 Forest Plan have effectively reduced or prevented adverse impacts to the Forest from mineral exploration and development activities conducted on MTNF over the past 20 years. Standards and guidelines in the 2005 Forest Plan are designed to protect sensitive resources and prevent or minimize adverse impacts to all natural resources.

PC# 361 - The Mark Twain National Forest should complete a comprehensive study of the effects of mining.
A) Before making a decision to allow or disallow mining exploration and mineral extraction in the Mark Twain National Forest.
B) Including the details concerning transportation, materials handling, and tailings disposal.
C) Before issuing any lead mining permits.
D) To adhere to interagency responsibilities.
E) Including the economic impact of mineral production on the Forest using decadal data, lead prices, and supply and demand information.

PC#361 - The Forest Service does not issue permits for mineral exploration or development. The Bureau of Land Management is the agency responsible for regulation of federal minerals, including those that may occur beneath the Mark Twain National Forest. Any decisions regarding mineral activity on MTNF lands would be made on a site-specific basis after thorough NEPA analysis and documentation of potential impacts. The USGS is currently researching several aspects of mineral development impacts, and such studies would be a part of any site-specific evaluations.

General Theme 25 - Other

Theme 25.1 - Organization

PC# 91 - The Mark Twain National Forest should purge employees that pose a threat to constitutional rights.

PC#91 - We respectfully disagree with the commenter's perception that Forest Service employees are working to overthrow government or are a threat to anyone's rights. Forest Service employees manage National Forest lands in compliance with applicable laws and Congressional or administrative direction. Most Forest Service employees accepted jobs primarily because they love and appreciate our Nation's natural resources and understand that the welfare of people and natural resources are inextricably connected. Making these kinds of charges insults the professional integrity of the people who work hard to insure the long-term health of our Nation's resources.

PC# 219 - The Mark Twain National Forest should provide more personnel to interact with the public and protect public interests.
A) To provide a positive influence and better public relations.
B) In addition to an evaluation of the current effectiveness of forest personnel and adequacy of resources.
C) Including attendents at Blue Book Tower and Noblett Lake.

PC# 219 - Personnel decisions and actions are outside the scope of Forest Plan decisions. With about 1.5 million acres of National Forest land, it is impossible to have permanent staff at every recreation site. There are many more opportunities for public contacts than the Forest has people or time to take advantage of. In these times of federal budget deficits and rising concerns about government spending, it is unlikely that Congress will ever appropriate enough money for the Forest Service to have an intensive program of public contact such as the commenter recommends.

PC# 220 - The Mark Twain National Forest should provide opportunities to employ people.
A) Through Americorps.
B) Instead of using equipment or chemical treatment.

PC# 220 - While personnel decisions and actions are outside the scope of the Forest Plan decisions, the Mark Twain National Forest does provide opportunities to employ people in accomplishing resource objectives, and will continue to do so when possible. Americorps has constructed and maintained trails on MTNF and has assisted in prescribed burns and wildfire suppression. Mingo Job Corps employees have also worked on Forest projects, and MTNF hires young people for the Youth Conservation Corps to work each summer. Other opportunities include the STEP (Student Temporary Employment Program) and SCEP (Student Career Experience Program), as well as the SCSEP (Senior Conservation Service Employment Program). The work these people do is invaluable in getting resource work on the Forest accomplished.

Theme 25.2 - Use wood ash as fertilizer

PC# 89 - The Mark Twain National Forest should use wood ash as a fertilizer.
A) Because it contains valuable materials to grow plants after a forest fire.

PC#89 - The use of wood ash as a fertilizer would be a project level decision, not one decided by the Forest Plan.

Theme 25.3 - Effects on Climate

PC# 318 - The Mark Twain National Forest should consider the cumulative impacts of land use on climate.
A) Because any action by the Forest Service may force change in the hydraulic cycle, the climate, and greenhouse forcing.
B) Because a number of studies link forest cover with regional climate conditions.
C) Because increases in CO2 as a result of timber harvest, roadbuilding, and burning could result in global climate change.
D) By assessing how much carbon is being stored in the forest and how the proposed actions will release stored carbon.

PC#318 - One of the realities of CO2 emissions is that much of the carbon release is the product of burning ancient fossil fuels (coal and oil) tied up over thousands of years deep in the earth. Any activity that completely destroys both soil and vegetation layers (till farming, dozing and clearing, road and structure construction, dams and draining of wetlands) disrupts the natural balance of carbon sequestration by above ground vegetation and below ground soils. Research specific to various vegetation types indicates that carbon is sequestered both above and below ground, depending on the ecosystem type, soil conditions, and climate.

Both above and below ground carbon was significantly reduced during Missouri's exploitative era following European settlement. Missouri suffered a century of overgrazing, poor farming and nearly complete removal of timber resources. This early cultural landscape change caused severe soil erosion and a dramatic loss of overall biomass. Since this exploitation, the 1.5 million acres of the Mark Twain National Forest has seen a long period of slow vegetation recovery, primarily in the form of tree growth. Livestock no longer range freely over the Forest and some ground cover biomass is recovering. The 2005 Forest Plan ecosystem framework identifies restoration of healthy natural communities over the plan period. Increasing grass and forb ground cover associated with healthy ecosystems should increase biomass above and below ground; thus, increasing or having no net loss in CO2. Also, while prescribed burning releases CO2, the resulting response to biomass should

compensate for the temporary loss. Prescribed burning ultimately reduces the absolute amount of carbon released because the absolute magnitude of wildfires decreases, even when some natural communities slowly return to greater fire frequency. The more complete combustion of healthier ground cover fuels is replaced by biomass regrowth and an increasing uptake of carbon below ground in the deep roots of prairie grasses and wildflowers. For example, grasslands (Midwestern prairies) can accumulate as much as 1,225 pounds of organic content per acre per year.

All live aboveground biomass on timberland in Missouri totaled 554.3 million dry tons in the 1999-2003 FIA inventories. Private landowners hold 82.3 percent (456.3 million dry tons) while public lands have 17.6 percent or 97.9 million dry tons.

Forest Service timber inventories for the past 4 decades indicate a continuous increase in net timber volume on federal lands (growth in biomass exceeds removal). This is also true on the Mark Twain National Forest where estimates of total timber volume have increased over the span of the existing forest plan. Of trees harvested on the Mark Twain, approximately 1/3 is sequestered or "locked up" in some form of wood product until such time as it decomposes upon disposal; 1/3 is burned as an alternative fuel, which offsets burning of coal. Some CO2 may be burned or emitted in the form of residue leaf litter and tops, but in the aggregate across the forest, regeneration growth should result in a balanced carbon cycle. While we would agree that destroying vegetation/soil by road building would count toward more CO2 emissions, we do anticipate that the total miles of new system roads would be insignificant.

We believe the rates of change are likely to be slow enough that our ability (if any) to exert major influence will not be compromised by the direction of management our Forest Plan establish for the next 10-15 years. In fact, recovery of healthy ecosystems may increase carbon sequestration.

PC# 400 - The Mark Twain National Forest should act in its stewardship capacity.
A) Because the forest has a responsibility to the public and to provide accurate and honest information.
B) By following through on all its promised management activities.
C) Because the Forest Service is accountable to the public, not extractive industry.

PC#400 - We are keenly aware of the important stewardship responsibility the Mark Twain National Forest has in conserving the natural resources on public lands. Handling the disagreement and criticism on how well we perform that responsibility is, and always will be, a part of managing the public lands that provide many different uses to many different people. Therefore, we note your comments as your point of view.

The Planning Team and all the employees who manage the resources on the Mark Twain National Forest are dedicated people who perform their jobs in a professional manner, seeking to do what is appropriate for the land and for the public whom we serve.

Theme 25.4 - Private Property

PC# 232 - The Mark Twain National Forest should consider that they cannot administer policy over roads that are not under Forest Service jurisdiction.

PC#232 - We respectfully disagree with the commenter that many old roads on the National Forest are public roads not under Forest Service jurisdiction. All roads located on Mark Twain National Forest lands are subject to Forest Service jurisdiction unless an easement has been granted or they are subject to a prescriptive right.

PC# 245 - The Mark Twain National Forest should apply the rules of the forest plan to private land owners.
A) Including impacts of home building on habitat.

PC#245 - The 2005 Forest Plan would apply only to lands administered as the Mark Twain National Forest. Private owners have the option to work with the Missouri Department of Conservation to develop their own management plans for their forested acres. The potential impacts of home development within MTNF boundaries is described in cumulative effects sections on pages 3-102, 3-106, 3-110, 3-113, etc.

PC# 364 - The Mark Twain National Forest should consider impacts of forest management on neighboring regional, private, and public land.
A) Including visual management and visual quality objectives of timber harvest where private property borders forest lands.
B) Including even-aged management.

PC#364 - Because of the fragmented ownership pattern of the MTNF (FEIS pages 3-77 through 3-79), Forest Service employees are sensitive to the concerns of our non-Forest neighbors. Decisions regarding the type and extent of forest management activities adjacent to private property, including timber harvest, are more appropriately made at the project level. During project planning and analysis, adjacent landowners are identified and contacted regarding any site-specific concerns they may have. Landowners may also contact the District office at any time and express their concerns regarding management of adjacent National Forest System lands. Visual management standards and guidelines are found on pages 2-24 and 2-26 of the 2005 Forest Plan.

Theme 25.5 - Land Acquisition

PC# 47 - The Mark Twain National Forest should consider giving up land or not having a National Forest in Missouri.
A) Because of the increased harassment of timber harvesters and other forest users by law enforcement.

PC#47 - The decision of whether or not to have a National Forest in Missouri is made by Congress, and is outside the scope of this Forest Plan revision.

PC# 87 - The Mark Twain National Forest should lease land rather than accept it as a donation or acquire in fee.
A) Because property tax liability would remain with the original private land owner.

PC#87 - The Mark Twain National Forest does lease land in a number of instances, including administration sites and a variety of easements (road, scenic, and conservation.) In all of these cases, tax liability remains with the private landowner. By the same token, the acres of leased land and any revenues would not be included in the money returned to states and counties from the federal government.

PC# 130 - The Mark Twain National Forest should purchase land for developed recreation in the Fish Trap Shut Ins area.

PC#130 - Purchase of a specific piece of land is a site-specific decision. See also the discussion of the Relationship of the 2005 Forest Plan to Other Documents on Preface-1 of the 2005 Forest Plan and Relationship between Programmatic and Site-Specific Analysis on page 3-1 of the FEIS.

PC# 284 - The Mark Twain National Forest should aggressively seek out federal money for acquisition of lands.
A) To protect large areas of habitat and corridors.
B) Such as the Land and Water Conservation Fund.
C) Including coordination with non profit land protection organizations and state agencies.

PC# 285 - The Mark Twain National Forest should change goals, standards and guidelines regarding Land Acquisitions and Exchanges.
A) In the context of mineral management.
B) Because the practice of trading real estate is viewed as a scam to avoid culpability and accountability.
C) Because the fragmented nature of the Mark Twain makes it essential that external threats to public land be addressed.
D) Including analysis based on the emphasis of protection and long term viability of ecosystems.
E) Including prohibition of land exchanges for purely economic or administrative reasons.
F) Including seeking to buy land, not trade it.
G) Including eliminating the of disposal of isolated tracts of National Forest System Lands.
H) Including lands acquired under the Land and Water Conservation Fund Act.
I) Including prohibition on the exchange of lands recently harvested for timber.
J) Including a standard requiring consideration of placing deed restrictions on Forest Service land to be exchanged.
K) Including a standard that Forest Service lands are not generally available for exchange and the preferred method of acquiring lands is purchase.
L) Including the conversion of guidelines into standards.
M) Including that the goal to "emphasize disposal of isolated tracts in National Forest System Lands" should only be done after establishing that these lands contain no globally significant or irreplaceable elements of biodiversity.
N) Including prohibiting land swaps that encourage further lead mining.
O) Including acquiring public lands to provide buffers and corridors to protect sensitive habitat.
P) Including aquiring and exchanging tracts based on analysis that emphasizes the protection and long-term viability of ecosystems.

PC#284, PC#285 - Many of these comments relate to analysis of specific land acquisitions. It should be pointed out that the Forest Plan is only one of many documents used in determining project feasibility. As stated throughout the 2005 Forest Plan, additional Forest Service direction is found in both manuals and handbooks. This is in addition to specific laws related to Lands Acquisition and money available for purchase.

The Mark Twain National Forest continues to work with non-profit organization to acquire lands. Each year the Forest successfully competes for Land and Water Conservation Fund (LWCF) dollars and many years are positioned to use additional funds. Annually, the Lands staff identifies parcels of land that qualify for the LWCF purchase program and makes a Land Acquisition Request. The 2005 request includes three ecosystem and recreation emphasis needs: important wildlife habitat adjacent to major Ozarks streams and rivers, expanded public ownership in areas of heavy outdoor recreation use, and in-holding within designated wilderness areas. Funds requested are two million dollars to purchase 1,600 acres across southern Missouri. In addition, over 20 tracts totaling 5,000 acres valued at 5 million dollars are identified to meet the emphasis needs.

Within this request is the following statement “The proposed acquisitions for Fiscal Year 2005 and beyond will enhance National Forest Management by precluding the destruction of

existing ecosystems threatened with further subdivision and development. These properties will add significantly to the diversity and balance of wildlife habitats and recreation opportunities on public lands in the region. They will also reduce administrative cost for property lines, road rights-of-way, special use permit management, and adverse title claims processing."

From 1996 to 2004, just over 89.3 million dollars were used to purchase 8,100 acres with LWCF funds on the Mark Twain NF.

Land acquisition is conducted in accordance with laws, regulations, and Forest Service policy many of the suggested changes to standards and guidelines are covered within these other documents. In the case of prioritizing LWCF acquisitions, we use suggested guidance in accordance with the enabling legislation.

#285 L - All standards and guidelines were developed by resource specialists familiar with the Mark Twain National Forest. These specialists are also very knowledgeable in their particular field of expertise including hydrology, ecology, forestry, and wildlife biology. Determining the appropriate level of measure (standard or guideline) was done using the interdisciplinary team of specialists' knowledge and experience as a foundation. In some cases, scientific literature helped the specialists develop the appropriate level of measure as well as the numbers, dates, or other quantifiable criteria specific to standards or guidelines. The specific distances and criteria used in the development of all standards and guidelines are scientifically sound. We do agree that the standard "Reserve subsurface rights in land exchanges only when known mineral deposits occur in the vicinity" should be a guideline, and that change has been made in the 2005 Forest Plan.

Theme 25.6 - Law Enforcement

PC# 9 - The Mark Twain National Forest should use unmarked law enforcement vehicles at Hazel Creek, Berryman, and Brazil Creek campgrounds.

PC# 98 - The Mark Twain National Forest should enhance enforcement of laws prohibiting illegal activities.
A) As an alternative to closure.
B) Including arson in the Chadwick area.
C) Including designated wilderness and other protected areas.
D) Including an increase in rangers
E) And include special permits for the elderly, disabled, and in season hunters.
F) Because of the destruction to habitat by ATVs.
G) Including Big Spring to protect rare plants.

PC#9 andPC# 98 - While law enforcement methods to address site-specific problems are outside the scope of Forest Plan decisions, we will pass your suggestion on to Mark Twain National Forest law enforcement personnel.

PC# 102 - The Mark Twain National Forest should hold timber harvesters accountable for harvests in wrong locations.

PC#102 - Loggers are held accountable for violations of their sale contracts, which would include harvests in the wrong locations. Under FS timber sale contracts, stumpage must be paid for timber cut by mistake, plus applicable penalties or fines. In the case of criminal violations other penalties may apply, such as fines, debarment, or incarceration.

PC# 337 - The Mark Twain National Forest should include standards on the number of Law Enforcement Officers.

PC#337 - Personnel decisions and actions are outside the scope of Forest Plan decisions.

Comments from Agencies and Elected Officials

Comments received from federal, State, local agencies and elected officials are represented in the public concern statements. This section presents the comments from these agencies and officials in their entirety (FSH 1909.15.24.1.3).

Table 2 - List of Tribal, Federal, State and Local Agencies and Elected Officials

Letter Number	Organization Name	Respondent
	Tribal Officials	
75	Eastern Shawnee Tribe of Oklahoma	Jo Ann Beckham
	Federal Agencies	
799	US Environmental Protection Agency	Gale Hutton
385	US Department of the Interior Fish and Wildlife Service	Robert Stewart
1411	US Department of the Interior National Park Service	Robert Stewart
741	Department of Interior Bureau of Land Management	Aaron Horton
	Federal Elected Officials	
493	US House of Representatives	Jo Ann Emerson
	State Agencies	
106	State of Missouri Office of Administrative Intergovernmental Relations	Laurie Morris
755	Department of Natural Resources	Doyle Childers
740	Missouri Department of Conservation	John Hoskins
600	Missouri Department of Conservation	Doyle F. Brown
739	Missouri Department of Conservation	Jeff Briggler
	State Elected Officials	
727	Missouri Senate	Frank Barnitz
384	Missouri House of Representatives – Missouri Forest Products Caucus	Frank Barnitz, Mike Dethrow
737	Missouri House of Representatives	Mike Dethrow
736	Missouri House of Representatives	Barney Fisher
797	Missouri House of Representatives	J Kuessner
796	Missouri House of Representatives	Peter Myers Sr.
792	Missouri House of Representatives	Darrell Pollock
349	Missouri House of Representatives	John Quinn
734	Missouri House of Representatives	Ron Richard
360	Missouri House of Representatives	Therese Sander
468	Missouri House of Representatives	David Sater
735	Missouri House of Representatives	Don Wells
738	Missouri House of Representatives	Jim Whorton
794	Missouri House of Representatives	Patricia Yeager
	County Officials	
743	Dent County Commission	JJ Tune
729	Howell County Commission	Larry Spence, Mark Collins, Bill Lovelace
733	Oregon County Commission	Leo Warren, John Wrenfrow, Buddy Wright
732	Texas County Commission	Donald Shelhammer, Joe Whetstine, Linda Garrett

W0075

EASTERN SHAWNEE TRIBE
OF OKLAHOMA

P.O. Box 350 · Seneca, MO 64865 · (918) 666-2435 · FAX (918) 666-2186

March 2, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
P.O. Box 22810
Salt Lake City, UT 84122

RE: REVISED FOREST PLAN FOR THE MARK TWAIN NATIONAL FOREST

To Whom It May Concern:

Thank you for notice of the referenced project(s). The Eastern Shawnee Tribe of Oklahoma is currently unaware of any documentation directly linking Indian Religious Sites to the proposed construction. In the event any items falling under the Native American Graves Protection and Repatriation Act (NAGPRA) are discovered during construction, the Eastern Shawnee Tribe request notification and further consultation.

The Eastern Shawnee Tribe has no objection to the proposed construction. However, if any human skeletal remains and/or any objects falling under NAGPRA are uncovered during construction, the construction should stop immediately, and the appropriate persons, including state and tribal NAGPRA representatives contacted.

AEEC RECEIVED
MAR 15 2005

Sincerely,

Jo Ann Beckham

Jo Ann Beckham
Administrative Assistant

W 1807

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

05 MAY 2005

dup of 799 w/ATT

Content Analysis Team
Mark Twain National Forest Plan Revision
P.O. Box 22810
Salt Lake City, Utah 84122

Dear Content Analysis Team:

RE: Mark Twain National Forest Land and Resource Management Plan, Implementation, Revise to the 1986 Land and Resource Management Plan, several counties, MO

The Environmental Protection Agency (EPA), Region 7, has reviewed the Forest's Draft Environmental Impact Statement (DEIS) for the Revision of Forest Management Plan, Mark Twain National Forest. The EPA reviews DEIS documents in accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act. Section 309 directs EPA to review and comment in writing on the environmental impacts of any major federal agency action. EPA's comments include rating the environmental impacts of the alternatives and the adequacy of information in NEPA documents. This DEIS was assigned a Council on Environmental Quality (CEQ) number 050037.

EPA expresses concerns with three aspects of the DEIS: 1) Air Quality Impacts, 2) Cumulative Impacts Analysis, and 3) Adaptive Management (indicators, monitoring and process). EPA's detailed questions, comments, and concerns regarding the analysis, documentation, and potential environmental impacts of the (draft) Forest Management Plan are enclosed with this letter. These comments propose additional information for the Final EIS regarding impacts analysis. Based on the procedures that EPA uses to evaluate the adequacy of the information and the potential environmental impacts of alternatives, the DEIS is rated "EC-2" which means "Environmental Concerns - Insufficient Information". A copy of EPA's rating criteria is enclosed.

EPA appreciates the productive meeting between EPA and the Forest Service on March 24, 2005, at the Missouri Resource Assessment Partnership (MoRAP) offices in Columbia, Missouri. At that meeting, it was learned that the Forest Service intends to develop environmental assessments for each prescribed burn, and that a programmatic level smoke management plan would provide the detailed framework for those assessments, including air quality factors that will be considered when deciding to burn or not to burn. EPA desires to work with the Forest Service to identify a reasonably effective combination of predictive tools and real time measurement tools (like the U.S. Forest Service's BlueSkyRAINS) and continuous ambient air monitoring that can be used for evaluating and adjusting individual prescribed burns to mitigate their effects. These tools should encompass all of the air pollutants of concern including $PM_{2.5}$, PM_{10}, NOx, and CO.

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MAY 16 2005

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PAPER CONTAINS RECYCLED FIBERS

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Thank you for considering our concerns and comments. Questions about these comments should be directed to Mr. Joseph Cothern, NEPA Team Leader, at (913) 551-7148 or cothern.joe@epa.gov.

Sincerely,

U. Gale Hutton
Director
Environmental Services Division

Enclosure

cc: Laura Watts, U.S Forest Service
Missouri Department of Natural Resources
Missouri Department of Health
Missouri Department of Conservation

WI807

EPA Comments on the Mark Twain National Forest Management Plan Draft Environmental Impact Statement

General Comments

Project Overview:

The Forest Service (USFS) evaluates revision alternatives to the Forest Management Plan for the Mark Twain National Forest of located in central to south Missouri. The DEIS analysis covers approximately 1.5 million acres of National Forest lands.

Revision topics include (1) Vegetation and Timber Management, (2) Ecological Sustainability and Ecosystem Health, (3) Fire Management, (4) Management Areas, (5) Riparian Areas and Water Quality, (6) Threatened, Endangered, and Sensitive Species Viability, (7) Access and Transportation Management and (8) Monitoring and Evaluation. The goal of revising the Forest Management Plan is, "to provide environmentally sensitive, socially responsive, economically feasible, and scientifically sound multiple use management." The importance of incorporating adaptive management principles and contemporary information and science are highlighted in the Need to revise the Forest Management Plan. EPA agrees with these stated goals, and intends to assist the Forest in obtaining the most current and appropriate information to help inform this Revision.

Alternatives

Four alternatives plus "No Action" are evaluated in the DEIS:

(A) Alternative 1 minimizes direct human influence. No commercial timber harvest would be allowed. Natural disturbance factors would be the primary influence on the forest environment. Management would focus on visitor safety, law enforcement and custodial elements.

(B) Alternative 2 emphasizes restoration of terrestrial natural communities while providing forest products and multiple use benefits. Management prescriptions would be employed to attain and sustain habitat and species diversity. A broad spectrum of recreational opportunities would be provided.

(C) Alternative 3 (Forest Service's Preferred Alternative) is designed to seek a balance between natural community restoration and production of traditional forest commodities.

(D) Alternative 4 represents an emphasis on traditional forest management and production with an emphasis on ecosystem enhancement. Extractive use and recreation activities would influence ecological processes.

(E) Alternative 5, The No Action Alternative reflects current Forest-wide direction and continues current management allocations and activities. The management direction found in the 1986 Forest Plan, as amended, would continue. The 1986 plan gives strong emphasis to wildlife habitat development.

WI807

Air Quality

The Preferred Alternative proposes a fivefold increase in prescribed burning over the existing Forest Management Plan. EPA's concerns with this degree of burning increase include impacts to St. Louis attainment status, impacts to Springfield-Branson, Hercules Glades Class I visibility area, and health impacts to local communities (in which sensitive and Environmental Justice populations may reside).

In formulating these comments, EPA conducted preliminary modeling to estimate the $PM_{2.5}$ impact resulting from a single burn in the Mark Twain National Forest, over a 7 day period. We followed the U.S. Forest Service BlueSkyRAINS approach. Specifically, our model used the Fire Emission Production Simulator 1.0, EPM2BAEM pre-processor (version 1.0), CALPUFF version 5.711a, and CALPOST software for post-processing. The burn-specific parameters used to run the model, (such as fuel load characteristics and fuel moisture category) were discussed with the U.S. Forest Service prior to running the model. This modeling yielded $PM_{2.5}$ impacts above $0.1 ug/m^3$ for Hercules Glades and St. Louis on certain days. Although meteorological inputs to the model were limited (not including meteorological data for the entire burn window) $PM_{2.5}$ concentrations of concern extended several hundred kilometers downwind from the event source on certain days. The absolute magnitude of impact will vary by location of the fire and dispersive characteristics of the atmosphere.

In the absence of more detailed modeling, and a smoke management plan to guide burn operations, the potential for long range transport of fire emissions to sensitive receptors such as Hercules Glades and St. Louis substantiates EPA's environmental concerns with the Preferred Alternative. While EPA recognizes that the Draft EIS for the Draft Revised Forest Plan for the Mark Twain National Forest will assist in decision-making at the "program-level", and discusses environmental impacts on a broad scale, it is imperative that individual prescribed fires receive detailed scrutiny through individual environmental assessments.

A smoke management plan should be developed that outlines the steps the U.S. Forest Service's program will take for specific prescribed burns to reduce emissions, increase plume dispersion, coordinate (within the forest service as well as with other authorities) and communicate with the public to minimize the negative impacts of the prescribed burning on air quality. Communication needs to be effective and timely to allow individuals to take any steps necessary to adjust their behavior and resultant exposure to protect their personal health. In addition to the timing of the prescribed fires, information should be disseminated regarding the potential impacts on air quality and as a result, human health and the environment, and mitigation methods that could be followed by sensitive individuals should be provided. Furthermore, the plan should outline the plans for monitoring the impacts of burns, potential contingency measures and a decision hierarchy for adjusting plans in response to monitoring and actual burn conditions. The smoke management plan should also describe how the U.S. Forest communicates internally and with other officials to coordinate specific burns within the Forest and in other National Forests (particularly upwind in Arkansas and Oklahoma) to minimize the impact of prescribed burning on a more regional basis. Control strategies such as limiting the dates of burning to days outside the ozone window, limiting the volume of burning on the same or consecutive days on a regional basis, etc., should be included to limit emissions on a regional basis.

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While we have seen elements of the smoke management plan that is being developed, (the April 2001 Draft "Comprehensive Guide to Incorporating Air Quality Effects of Prescribed Fire Management into Mark Twain National Forest Land Management Planning" and "FSM 5100 - Fire Management, Chapter 40-- Prescribed Fire") the current draft does not contain an adequate description of the level of analysis that will be undertaken to ensure the protection of human health and the environment with the implementation of the preferred alternative.

Cumulative Impacts

Cumulative impacts from proposed management direction are briefly noted throughout the document. However, we believe additional evaluation and discussion of direct, indirect, and cumulative impacts is needed in the Final EIS. EPA recommends that the Forest Service utilize recently developed spatial information from the Missouri Resource Assessment Partnership (developed under EPA/MoRAP Cooperative Agreement). These data and assessment tools appear to have direct application to the management directions expressed in the Revised Forest Plan and reveal some of the cumulative stresses that are being experienced within the project area.

EPA urges the MTNF to coordinate with the Ouachita and Ozark-St. Francis Forests in Northwest Arkansas to ensure that burn activities in those forests do not contribute (cumulatively) to exert a negative effect on Missouri populations or resources.

Adaptive Management

The Purpose and Need emphasizes the desire for a more adaptive management approach. EPA understands the value of an adaptive management process, especially when stressors are in flux or when essential information is not currently available. The DEIS does not provide details of how research results, monitoring data, and other information may be used to inform adaptive management decisions. EPA recommends the inclusion of additional details in the Final EIS regarding monitoring plans, planning forums and how adaptive management will be implemented consistent with those inputs, and focused on revision topic goals.

Monitoring plan details should note the monitoring and management protocols, thresholds, proposed responses to foreseeable and unforeseeable impacts, and budget and resource needs and availability. Monitoring is critical for an adaptive management approach that can respond to changing environmental conditions, habitat alteration, regulatory changes, and other stresses.

Specific Comments on the DEIS

Revision topic 1b - An adaptive management process for silvicultural flexibility should be supported with a well developed monitoring program. EPA recommends inclusion of a diagram of the adaptive management process and actions to be taken per monitoring results in the Final EIS.

Revision topic 3b - Prescribed fire should be employed with due regard for the following: Protection of human health (including Environmental Justice populations), Air Quality Designated areas (St. Louis, Hercules Glades), and areas which may have future air quality

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challenges during the life of the Revised Forest Plan (high growth metropolitan areas such as Springfield-Branson).

Issue 1- Timber Supply, Issue Statement, page 1-11, the issue statement indicates that "Forest Plan Revision will establish the acreage and location of land that is suitable for timber production (996,712 acres, Appendix E-1). EPA recommends that the "location" of suitable land (as summarized in Table 5, page 3-26) be depicted in the map appendix.

Pesticide Contamination, Cumulative effects, Page 3-109 - Without an accounting of the pesticide products used by "other ownerships" and volume applied, the declaration that no cumulative effects exist could be questioned. It may be useful to query local noxious weed control authorities, County Extension agents, and other sources to assess the magnitude of pesticide application, and the fate and transport of the specific products that are in use.

Ozark Hellbender, pages 3-128 and 3-129,- Specific human activities, (including non-native species introductions) are listed as potentially adverse to the Ozark Hellbender. Although the "Ozark Hellbender Working Group" has not identified "actions that the Mark Twain NF would be responsible for",…are there opportunities to reduce specific impacts, even if the MTNF is not the actionable agency? For instance, how many stream miles are not adequately fenced? Could the canoe liveries provide portable or fixed toilet facilities/rest spots along float routes?

Pages 3-146 thru 3-150, the scientific name of the three mussel species should be verified. The text currently reads *L. leptodon* for all three of the described species.

Fire Management, Issue Statement, Page 3-159 - The Revised Forest Plan does not contain the specifics of "how, where, and to what extent prescribed fire may be used".

Air Quality, Page 1-173, "Affected Environment" section, 2nd Paragraph - EPA recommends replacing "EPA accepted levels" with "the National Ambient Air Quality Standards (NAAQS)"

Page 3-179, top of page - EPA appreciates the Forest's contributions in developing a Statewide Smoke Management Plan. Until the plan is completed, EPA offers assistance in evaluating effects of individual prescribed fires.

Page3-190, cited webpage at www.mo.water.usgs.gov is a dead link. EPA recommends replacing with http://waterdata.usgs.gov.mo/nwis.

Effects from Rangeland Management, Page 3-206 - What is known about "other ownerships" grazing practices which could be affecting Forest management objectives?

Cumulative Effects, Page 3-211, first paragraph - EPA recommends that the temporal boundaries for the cumulative effects analysis be more specific than simply "the planning period". If the planning period amounts to the next 15 year increment of a Forest Management Plan it may not account for land use projections that may cover a longer time span such as county master plans, existing plans of the State Economic Development Office or other inputs valuable to a comprehensive cumulative impacts analysis.

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Wilderness Use, Page 3-245, 3rd paragraph - What is the horse density standard? How is use that exceeds the standard managed?

Cumulative Effects, page 3-251, 3rd paragraph - What are the specific indicators of overuse in Paddy Creek Wilderness? Are there management activities that can control or mitigate this adverse cumulative effect?

Table 57 - Should the date of the Forest Plan Revision be 2005?

Population and Demographics, page 3-277, 1st paragraph - Are the growth rates differentiated enough to determine the age group of the growth? If this represents a retirement population, then the demand for forest related jobs and recreation may be much different than an influx of people of child-bearing age.

Environmental Justice, Pages 3-296 thru 3-297, Low income populations could receive a disproportionate impact from burn operations, since they may not be able to temporarily vacate a smoke plume. Smoke effects to environmental justice and sensitive populations (children and respiratory system impaired individuals) should be given diligent examination during burn planning.

Effects on Consumers, Civil Rights, Minority Groups, and Women, page 3-302, 2nd paragraph - Executive Order 12898 is not "part of (the) National Environmental Policy Act", but rather, it is to be a consideration given to Federal actions which are subjected to analysis under NEPA.

Appendix A-7, Revision Topic 2d, Revise Management Indicator Species (MIS) - EPA recommends evaluation of the sub-watershed species predictor work being compiled by MoRAP. A homogenous MIS list across all MTNF Districts may limit flexibility, or may establish un-attainable objectives.

Appendix E-11, the reach of Cedar Creek just north of the District boundary had a Total Maximum Daily Load (TMDL) approved by the U.S. EPA on July 14, 2004. Specific requirements of this TMDL are provided as an attachment to this letter and can also be found at http://www.dnr.mo.gov/wpscd/wpcp/tmdl/wpc-tmdl-EPA-Appr.htm.

W0385

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Denver Federal Center, Building 56, Room 1003
Post Office Box 25007 (D-108)
Denver, Colorado 80225-0007

TAKE PRIDE IN AMERICA

April 27, 2005

ER 05/112

Mr. Randy Moore
Regional Forester
Eastern Region Office
626 East Wisconsin Avenue
Milwaukee, Wisconsin 53202

Dear Mr. Moore:

The Department of the Interior (Department) has reviewed the January 2005 Draft Environmental Impact Statement (EIS) and Draft Revised Forest Plan for the Mark Twain National Forest; Barry, Bollinger, Boone, Butler, Callaway, Carter, Christian, Crawford, Dent, Douglas, Howell, Iron, Laclede, Madison, Oregon, Ozark, Phelps, Pulaski, Reynolds, Ripley, Saint Francois, Sainte Genevieve, Shannon, Stone, Taney, Texas, Washington, Wayne, and Wright Counties, Missouri. As indicated in the Draft EIS, the U.S. Fish and Wildlife Service (FWS) is a cooperating agency in the development of the EIS. The Department offers the following comments and recommendations for your consideration.

COMMENTS ON DRAFT REVISED FOREST PLAN

General Comments

The Department is encouraged by and supports the Forest Service's plan to promote ecosystem health and sustainability. Working to restore, maintain, and enhance natural ecosystems on the Mark Twain National Forest (Forest) will benefit fish and wildlife species in Missouri.

We note that Management Prescription (MP) 3.5 is not among the management prescriptions listed and described in the Draft Revised Forest Plan (RFP). As this MP provided for the management of Indiana bat habitat around hibernacula and summer maternity areas, it is of particular concern to the Department and the FWS. The Draft EIS indicates that MP 3.5 was dropped as a result of the new Ecosystem Restoration prescriptions and application of the MP 3.5 Standards and Guidelines to Forest-wide use. We recommend that the Final EIS provide additional discussion of the rationale for removing this MP from the Forest Plan and how the standards and guidelines in the Revised Forest Plan address all of the components contained in

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MP 3.5. See the specific comments below for page 2-6 for recommended improvements to these standards and guidelines. The Final Plan should provide a description of how management will change (if at all) in the current Indiana bat Areas of Influence for all caves and in the Browns Hollow maternity area. The FWS recommends that the area of the Forest to which MP 1.1 applies be expanded, if needed, to include all current Indiana bat maternity colony areas and Areas of Influence for Priority 1 and 2 hibernacula.

Semlitsch and Bodie (2003) suggest that buffer zones of 15 to 30 meters around wetland and riparian habitats are not adequate for protecting many reptiles and amphibians. We suggest increasing the required size of buffer zones throughout the Revised Plan for wetland and riparian areas or making those buffer zone guidelines (i.e., Watercourse Protection Zone, Riparian Management Zone, fens, etc.) determinable at the site-specific level.

Specific Comments

Page 1-3: Objectives 1.3a, 1.3b, and 1.3c have very specific targets for miles of stream to be stabilized, acres of bottomland hardwood forests to be restored or enhanced, and miles of stream in which large woody debris would be placed, respectively. The level of specificity implies that the areas for this work may have already been analyzed and perhaps chosen. However, the Draft EIS fails to provide sufficient information to allow the reader to determine exactly how the specific targets were developed. We recommend that clarification on this issue be provided in the Final EIS. If specific areas for the proposed work have been chosen, they should be identified in the Final Plan. If specific areas have not been chosen, we suggest that the objectives be made less rigid in the Final Plan, so that any areas that appear to be appropriate for these types of activities can be analyzed further for possible selection.

Pages 1-3 and 1-4: Objectives 1.4a, 1.4b, 1.4c and 1.4d have specific targets in terms of acres or percentage increases desired for certain types of habitats on the Forest. As with the objectives discussed in the paragraph above, it is difficult for the reader of the Draft EIS to determine how these acres or percentage increases were arrived at in the Draft Plan. There also appear to be some possible discrepancies between the Plan and the EIS.

The Plan objective under 1.4b is to increase the proportion of managed native grasslands to that of exotic cool season grasses from the current 46 percent native grass to 55 percent native grass. However, the Draft EIS indicates (page 3-120, second full paragraph) only that under Alternatives 1-4 the amount of area in grasslands would not increase, but the proportion of native, warm-season grass to non-native, cool-season grass would likely increase. The Plan objective under 1.4d is to treat at least 4,000 acres of glades to reduce woody vegetation, but the Draft EIS (page 3-88) indicates that red cedar would be removed from 12,600 acres of glades. The final documents should address these apparent discrepancies. In addition, the Final EIS should provide additional information and discussion to allow the reader to determine exactly how the specific recommendations put forth in the Revised Plan were developed. Where possible, the Final Plan should provide references to the sections of the Final EIS which support and discuss each objective presented in the Final Plan.

Page 1-4, Objective 2.2a We support prescribed burning that emulates the range of natural variability for historical fire regimes in glades, savannas, and pine woodlands. The use of

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prescribed burning in some areas from May though September may negatively affect some wildlife species in the short term. However, in the long term, it will be of benefit by creating more suitable habitat for declining species. A thorough analysis of the effects of this type of burning should be completed at the site-specific level.

Page 1-6, Wilderness Opportunities In addition to supporting burning in the Hercules Glade Wilderness, we recommend the use of prescribed fire to maintain or enhance the Mead's milkweed population in the Bell Mountain Wilderness. A conservation recommendation to burn in the Bell Mountain Wilderness was included in the FWS's June 1999 Programmatic Biological Opinion for the Mark Twain National Forest. Yearly reports to the FWS indicate that there has been no progress in using burns in this wilderness area. The FWS understands the challenges facing the Forest Service in implementing prescribed burns in this wilderness area. However, the FWS believes this should be a priority recovery action that will maintain the viability of the only known population of Mead's milkweed on the Forest.

Page 2-2, Non-Native Invasive Species Management Keeping the goals of ecosystem restoration and enhancement in mind, we recommend that only native plants be used in landscaping projects in recreation areas.

Page 2-3, Riparian Management Zones (RMZ) We are pleased to see that the RMZ boundaries will be determined at the project level, instead of being a pre-determined, possibly arbitrary buffer. The FWS recommends the Forest utilize the guidelines by Semlitsch and Bodie (2003) in determining Riparian Management Zones.

We recommend that the proposed guideline regarding placement of livestock distribution tools be changed to a standard that excludes the placement of these tools in RMZs. Livestock tend to congregate at water tanks or salt blocks and can cause localized resource damage, including downstream or upstream channel cutting, depending on the placement of the tank or salt block.

Page 2-4, Riparian Management Zones We recommend that no new recreational facilities be created in RMZs. Human disturbance can negatively affect some wildlife species, especially during nesting seasons. Limiting the number of recreational facilities in RMZs to the current usage is preferred.

Page 2-4: The modification of beaver-created impoundments may be necessary to protect certain fen areas. We recommend that the Final Revised Plan clearly indicate that this practice would be allowed, if needed.

Page 2-4, Watercourse Protection Zone (WPZ) Prescribing a certain buffer area (100 feet on each side of the channel) seems arbitrary and may not provide protection to some areas and some species. The rationale for choosing a 100-foot buffer distance should be provided in the Final EIS. See our general comments on buffer zones and the conservation of reptiles and amphibians.

Page 2-4, Bald Eagle The FWS concurs that the standards and guidelines for the bald eagle are sufficient to protect the species on the Forest.

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Page 2-6, Indiana Bat The first guideline seems to be protective of suitable roost trees, however the end of the statement is ambiguous "...wherever possible with regard to...accomplishment of overall resource goals and objectives." The Final EIS and Plan should clarify if there are areas where all suitable roosts would be removed or if a minimum number of suitable roosts will be left in all areas that are currently suitable for the species. Indiana bats would probably not be found in some glade areas or in cedar thickets.

The first standard may not be protective of Indiana bat maternity colonies. The FWS would prefer this standard be changed to read: "If occupied Indiana bat maternity roosts trees are discovered, protect them from physical disturbance until they naturally fall to the ground. Minimize human disturbance in the foraging and roosting areas of the maternity colony until the colony has left the maternity area for hibernation. The character of the site should be maintained or enhanced by (1) maintaining an adequate number of snags, including known roost trees; (2) maintaining large live trees to provide for future roosting opportunities; and (3) maintaining small canopy gaps (or opening the mid-story) to continue to provide foraging habitat."

The second guideline can be improved by adding that radio tracking can be used to determine the home range of maternity colonies.

The second standard only discusses prescribed burning near roost trees used by male Indiana bats. A standard should be added to address prescribed burning near maternity colonies. Prescribed burning during the maternity season could negatively affect some individuals (especially non-volant juveniles) or could reduce the available prey base if the fire was severe. For this reason, the FWS prefers that any prescribed burning done in known maternity areas be conducted in the hibernation season.

A standard should be added to protect Indian bats during periods of swarming and staging, as these periods are critical periods for bats to replenish their body fat. Prescribed burning and removal of suitable roost trees in the 20 to 130-acre buffer zones around known hibernacula should be avoided between September 1 and November 1 (swarming period) and March 15 and April 31(staging period) or dates determined specifically for each cave.

Page 2-7, Hine's Emerald Dragonfly The FWS recommends that the first standard be revised to add the exclusion of heavy equipment or vehicles in fen areas. Off-highway vehicle (OHV) use, which includes all-terrain vehicle (ATV) use, has been documented in or around some fens on the Forest, including fens where the Hine's emerald dragonfly is known to occur. In some cases, this endangered species was impacted or eliminated from a fen by OHV use. The FWS recommends adding a guideline that would provide additional measures to protect fens from unauthorized OHV use.

Page 2-7, Old Growth Habitat The term "limited vegetation supervision" as used in the fifth bullet in this section should be defined.

Page 2-9, Streams and Rivers The use of heavy equipment in some streams could impact imperiled mussel species. A requirement should be included to conduct surveys to determine the presence or absence of rare mussel species before any work is done in streams.

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Page 2-9, Cold Water Fisheries The FWS supports the Forest's position that no trout be introduced into streams where they did not exist as of August 2002.

Page 2-11, Caves and Abandoned Mines - TES Management In addition to maintaining existing gates at occupied Indiana or gray bat caves, new gates may be needed at other caves as they are occupied by either species. Periodic monitoring at those caves is also necessary to detect trespass or vandalism.

Page 2-14, Prescribed Fire The third standard on this page discusses burning near roost trees used by male Indiana bats. This standard should protect these individuals as well as their roost trees. See the comments above in the Indiana bat section (page 2-6) regarding burning near known maternity areas.

Page 2-18, Pesticide Use The use of pesticides may negatively affect the prey base for Indiana bats and gray bats.

Page 2-26, Timber Management – Harvesting The third standard on this page includes the retention of at least 7 to 10 percent of the harvest unit in reserve trees and/or reserve tree groups. This could provide migratory or even summer roosting and foraging habitat for Indiana bats. We recommend that the Final Plan include the specific protocols that will be used in the field to ensure that this standard is met.

Page 2-39, Stream Crossings within WPZ or RMZ Fords are typically placed in riffle areas. Since riffle areas may contain mussel beds (including listed mussel species), the FWS recommends adding a standard that all proposed ford crossings will be surveyed for mussels by a qualified biologist prior to construction of any ford. If mussels are found during the surveys, the FWS recommends implementing measures to avoid impacts to mussels (e.g., moving the ford to another location).

Page 3-3, Management Prescription 1.1 We support the restoration of natural communities.

Page 3-4, Wildlife Management We recommend that the Forest allow some flexibility in the construction of wildlife ponds in MA 1.1. The creation of small, fishless ponds may benefit declining native amphibians in areas that do not presently have optimal habitat conditions.

Page 3-6, Management Prescription 1.2 We support the theme, goals, and desired conditions outlined in this MP.

Page 3-7, Wildlife Management We recommend that the Forest allow some flexibility in the construction of wildlife ponds in MP 1.2 for the same reason as provided above for MP 1.1 (see comments for page 3-4).

Page 3-22, Endangered, Threatened, and Sensitive Species The FWS recommends implementing a project to re-introduce fire in the Bell Mountain Wilderness to sustain and enhance the threatened Mead's milkweed. Failure to act on this issue could result in further declines and ultimate loss of this population of the milkweed.

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Appendix C, page C-7, item #6 This item should be modified and the reference to the June 23, 1999, Biological Opinion should be deleted after completion of Section 7 consultation on the new Forest Plan Revision.

COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT

General Comments

Alternative 1: This alternative could negatively affect some species that need early successional habitats that would be reduced with the long-term implementation of this alternative. We believe that active management across the Forest, as outlined in Alternatives 2 and 3, will provide for a better diversity of habitats for various wildlife species. Therefore, we do not recommend the selection of Alternative 1.

Alternative 2: This alternative would provide for the most acreage of ecosystem restoration. Creating a diversity of habitats across the landscape may increase wildlife diversity and viability. This alternative is the environmentally preferred alternative from a fish and wildlife standpoint.

Alternative 3: Alternative 3 is the Forest Service's preferred alternative. This alternative decreases the ecosystem restoration acreage of Alternative 2 and places additional emphasis on improving forest health conditions, production of forest products and other multiple use benefits, and enhancement of terrestrial natural communities. This alternative will benefit many fish and wildlife species. If this alternative is selected, the FWS recommends the inclusion of additional acreage in Management Prescription (MP) 1.1 for known Indiana bat maternity areas and Areas of Influence for Priority 1 or 2 hibernacula.

Alternative 4: This alternative emphasizes ecosystem enhancement while providing utilization of forest resources. Only 8.4 percent of the Forest would be in MP 1.1 or 1.2. We prefer ecosystem restoration across a larger area of the Forest as provided for in Alternative 2.

Alternative 5: This no action alternative reflects the current Forest Plan direction. We support the Forest's new direction in ecosystem restoration as proposed in Alternatives 2 and 3.

Transportation system: An analysis of the effects of the transportation system (including OHV/ATV use) on wildlife is deficient in the document. Wildlife impacts that should be properly addressed include: (1) direct removal of habitat; (2) fragmentation of habitat; (3) edge effects of differing types and depths; (4) introduction of exotics; (5) direct mortality (road kill or trampling of vegetation); (6) disruption or dispersal of some organisms and isolation of populations; (7) chronic disturbance from human activity and traffic; (8) increased hunting and fishing pressure; (9) alteration of disturbance regimes; and (10) disruption of hydrological processes.

Specific Comments

Page 1-7, Revision Topic 6 – Threatened, Endangered, and Sensitive Species Viability The Virginia sneezeweed should be added to the list of species to be considered in Forest Plan management.

W0385

Page 2-3, Management Prescriptions A review of table 1 indicates that Management Prescription 3.5 from the current Forest Plan is not one of the management prescriptions retained in the Draft Revised Forest Plan. See our previous comments in the second paragraph of general comments regarding the Draft Revised Forest Plan.

Page 3-41, first sentence of fourth paragraph We recommend striking the words "creation and." The Endangered Species Act supports an ecosystem management approach. Section 2(b) of the Act indicates that one of the purposes of the Act is "to provide a means whereby theecosystems [emphasis added] upon which endangered species and threatened species depend may be conserved."

Page 3-102, fourth bullet on page In this bullet, "Control non-native invasive species (K)," the "K" should be changed to "J."

Page 3-102, Table 16: Indiana bats may benefit from the control of non-native invasive species such as kudzu. Indiana bats have not been found in any snag that has vines covering it.

Page 3-103, Table 16 (cont): Hine's emerald dragonfly and Tumbling Creek cavesnail may also benefit from maintaining riparian structure and function, maintaining free-flowing streams and rivers, and minimizing sedimentation from National Forest lands.

Page 3-104, Table 17: Indiana bats may also be threatened by: (1) water quantity and quality (lack of water or impaired water quality); (2) loss of fire-dependant communities (more open forest conditions provide for less energetically expensive foraging opportunities and provide more solar exposure to roost trees – Indiana bats need solar exposure for thermoregulation); and (3) pesticides (especially insecticides), which can have direct and indirect impacts on both Indian bats and gray bats.

Page 3-105, Loss of Habitat from Permanent Land Conversion It does not appear that consideration was given to the fact that new campgrounds, parking lots, trail and road construction (other than temporary roads) would be permanent land conversions. We recommend that the Final EIS provide analysis of the effects of this type of activity on fish and wildlife resources.

Page 3-105, Water Quality and Quantity Degradation or Alternation Aquatic insects are also a part of the diet of Indiana bats. The same threats that affect gray bats could apply to Indiana bats.

Page 3-108, Competition Competition between gray and Indiana bats is an emerging issue. While there are no definitive answers to this issue, this issue should be addressed as a potential concern. As more research emerges on competition between these two species, it may be prudent to implement an adaptive management program.

Pages 3-128 to 3-154, Federal Threatened and Endangered Species The FWS is informally consulting with the Forest Service to determine effects on listed species. The effects analysis in these sections provides a sound foundation for the biological assessment of the Forest Plan on federally listed species.

W0385

Page 3-194, Water Use, last sentence in third paragraph The sentence states that the last comprehensive USGS water use study occurred before the 1986 Forest Plan was developed. The USGS compiles water use information nationwide every 5 years; the most recent, from 2000, is available on the internet at: http://water.usgs.gov/watuse/.

SUMMARY COMMENTS

For a number of the objectives described in the Draft Revised Forest Plan, there does not appear to be a strong correlation between the information provided in the Draft EIS and the specific targets (e.g., acres or miles of habitat) set out in the Forest Plan objectives. There also appear to be some possible discrepancies between the Plan and the EIS with respect to these targets, which should be addressed in the Final Plan and EIS. In addition, the Final EIS should provide more information and discussion to allow the reader to determine exactly how the specific recommendations put forth in the Revised Plan were developed. Where possible, the Final Plan should provide references to the sections of the Final EIS which support and discuss each objective presented in the Final Revised Forest Plan.

For continued consultation and coordination with the FWS on the above matters, please contact Theresa Davidson of the FWS's Columbia, Missouri, Ecological Services Field Office but stationed at the Mark Twain National Forest, Ava/Cassville/Willow Springs Ranger District Office, Ava, Missouri, phone: (417) 683-4428.

We appreciate the opportunity to review the document and provide comments.

Sincerely,

Robert F. Stewart

Robert F. Stewart
Regional Environmental Officer

cc: Mr. Ronnie Raum, Forest Supervisor, Mark Twain National Forest
Content Analysis Team, Salt Lake City, Utah

Reference

Semlitsch, R.D. and J.R. Bodie. 2003. Biological criteria for buffer zones around wetlands and riparian habitats for amphibians and reptiles. Conservation Biology 17(5):1219-1228.

W1411

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United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Denver Federal Center, Building 56, Room 1003
Post Office Box 25007 (D-108)
Denver, Colorado 80225-0007

May 17, 2005

ER 05/112

Mr. Randy Moore
USDA Forest Service
Regional Forester
Eastern Region Office
626 East Wisconsin Avenue
Milwaukee, Wisconsin 53202

Dear Mr. Moore:

The Department of the Interior (Department) has additional comments on the Draft Environmental Impact Statement (EIS) for the Proposed Revised Forest Plan (Plan) for the Mark Twain National Forest (Forest), in Barry, Bollinger, Boone, Butler, Callaway, Carter, Christian, Crawford, Dent, Douglas, Howell, Iron, Laclede, Madison, Oregon, Ozark, Phelps, Pulaski, Reynolds, Ripley, Saint Francois, Sainte Genevieve, Shannon, Stone, Taney, Texas, Washington, Wayne, and Wright Counties, Missouri. The following comments, provided by the National Park Service (NPS), Ozark National Scenic Riverways (ONSR), were received too late to be included in the consolidated set of comments sent to you April 27. We ask that you consider them to the extent practicable during preparation of the final EIS and Plan.

General Comments

The NPS's and the Department's interest in activities of the Forest is focused on the hydrologic connectivity of both the surface and subsurface watersheds of the Current and Jacks Fork Rivers, a portion of each from ONSR. In addition, we have an interest in the landscape matrix provided by Forest lands which buffer the narrow ONSR corridor and provide a regional habitat setting for park species.

The ONSR was established in 1964 specifically to preserve the scenic, cultural, natural, and recreational values of the Current and Jacks Fork Rivers and their corridors. One critical resource value which has scenic, natural, cultural, and recreational importance is the concentration of large freshwater springs. These springs provide up to 60 percent of river flows, create varied habitat for unique aquatic biota, and provide a scenic draw for many park visitors.

W1411

Mr. Randy Moore

The largest spring within the National Park System, Big Spring, is one of the centerpieces of ONSR. This spring is hydrologically tied, through a mature karst system, to lands within the Forest up to 40 or more miles away from Big Spring, as has been verified by dye tracing. Surface and subsurface activities within that karst system have the potential to directly degrade this resource. We want to reinforce the Forest understanding of this connection, since the draft EIS states on page 3-195, "The entire landscape that feeds a particular watercourse or courses must be considered when planning and implementing management activities."

Mineral Prospecting and Development

Some of these lands within the recharge zone of Big Spring are currently being considered for their ability to produce commercial-grade lead ore which, along with the mining support systems, would have the potential to greatly impact ONSR's ability to comply with its mandate to preserve Big Spring and other springs in the park, as well as preserve other park values influenced by the springs. We are concerned with the apparent direction of the Plan and its stated goal to "...provide for mineral prospecting and mineral development while complementing other resource management objectives." Previous experience with mineral development within Missouri, coupled with the poor health and environmental protection records of mining operations, shows that lead mineral development may not be compatible with other resources objectives, which would include the Forest's goal to "...protect the water quality and integrity of the watershed on Forest lands." We would be very concerned about the possibility of lead mining within the Current River and Jacks Fork River watersheds. Lead mining cannot occur without a surface withdrawal site and, therefore, the rather broad mining standards and guidelines described on pages 2-32 and 2-33 of the draft plan would need to be considered connected actions of any future potential mining authorizations.

We are also concerned with the statements in the third paragraph on page 2-15 of the draft EIS where the Forest Plan provides "appropriate and adequate direction" for minerals management "...while complementing other resource management objectives..." such as soil, water, wildlife, and other resources. While the Forest may not rule out lead mining for the Forest during the Plan analysis, we would expect there to be a thorough environmental analysis should lead mining be proposed for any location within the Forest in the future.

Wild and Scenic River status

We note the Current River in Ripley County was not evaluated as a potential Wild and Scenic River in the draft EIS. We wonder whether this current planning effort was an opportunity to consider this portion of the river as an addition under the Wild and Scenic Rivers Act. The Plan does recognize this reach of the Current River under Management Area 8.1, Designated Special Area. The standards and guidelines shown on page 3-50 and 3-51 seem to complement the values upstream in the ONSR.

Alternative 3

The Department is supportive of the Management Area 6.1 (Semi-Primitive Non-Motorized) in the vicinity of Big Spring and the east side of the southernmost portion of the park as discussed under Alternative 3. This area is across from the NPS Gooseneck Campground in the vicinity of Kelly Bluff. The standards and goals of this Management Area 6.1 complement the management of the

W1411

Mr. Randy Moore

adjacent park lands. There may be opportunities in the future for interagency trailheads, recreational trails, and other recreational activities on these adjacent lands.

Goal 1.3 – Soils, Watersheds, and Water Quality

This goal includes the protection of riparian and intermittent stream zones and State Outstanding Resource Waters but does not mention the protection of Outstanding National Resource (ONR) waters. The Eleven Point River, besides being one of the first national scenic rivers ever established by the Federal government, has also been designated an ONR. Designation as an ONR prohibits the degradation of the water quality. This designation of the Eleven Point River, and the ramifications of its designation, should be mentioned in the draft EIS and Plan, specifically in the Recreation section on pages 3-44 through 3-46, and particularly in the standards addressing mineral development. While ONR is mentioned in the draft EIS on page 3-254, the EIS does not describe the criteria for designation or the requirements of maintaining the Outstanding State Resource designation.

Goal 2.5 – Geology and minerals management

This goal includes a provision for minerals prospecting and development while complementing other resource management objectives. This goal appears too vague and should be more specific concerning the need to protect water quality and aquatic habitats in relation to these mining activities.

Draft EIS, page 3-187, Streams

This section discusses losing streams but it does not mention the groundwater connection between the Eleven Point River basin and the Current River basin, nor does it discuss the ramifications of Forest management on areas outside the Forest.

Summary Comments

The NPS would also support Alternative 3 as the alternative which, on the whole, emphasizes protection and management activities supporting and complementing the values of the adjacent lands of ONSR. However, the NPS has concerns about the potential of lead mining within the ONSR watershed and the potential to impact water quality, aquatic/riparian wildlife and recreational opportunities for which the ONSR was established. If lead mining is proposed in the future on Forest lands within the Riverway watershed, ONSR would like to be engaged as early as possible. The Department has a continuing interest in working with the Forest to ensure that impacts to resources of concern to the Department are adequately addressed. For matters related to concerns of ONSR, please contact Noel Poc, Superintendent, Ozark National Scenic Riverways, P. O. Box 490, Van Buren, Missouri, telephone 573-323-4236.

Sincerely,

Robert F. Stewart
Regional Environmental Officer

WO741

United States Department of the Interior

Bureau of Land Management-Eastern States

Milwaukee Field Office
626 E. Wisconsin Avenue, Suite 200
Milwaukee, Wisconsin 53202-4617

IN REPLY REFER TO:
1330(030)

April 28, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
P.O. Box 22810
Salt Lake City, UT 84122

Dear Madam or Sir:

The Bureau of Land Management (BLM) would like to take this opportunity to submit the following comments on the draft Mark Twain National Forest (Forest) Plan revision and accompanying draft Environmental Impact Statement.

As the Federal mineral leasing agency, the BLM feels that the direction developed under the 1986 Plan for Minerals Management, the accompanying stipulations attached to prospecting permits and leases along with the site specific surface requirements for any surface mineral activity will protect the surface resources of the Forest.

Regarding the selection of Alternative Three (Preferred Alternative), we would like to comment on certain "Proposed Management Areas" in the Salem-Potosi Unit and the Elevenpoint Unit. These two Units along with the Fredericktown Unit have hosted mineral activity or been the subject of mineral interest in the past.

The Salem-Potosi Unit contains mining activity and associated surface drilling. A large portion of this Unit's southern part has been designated as MP 1.1-"Natural Community Restoration Roaded Natural ROS". This designation has also been applied to a large portion of the Elevenpoint Unit, which in the past has been host to considerable base metal exploration. We are concerned that the MP 1.1 designation may be too restrictive for some types of surface disturbing activities associated with mineral exploration if a reforestation project is started in the Units.

Although no mineral activity is currently taking place in the Elevenpoint Unit at present, the Salem-Potosi is undergoing drilling activity in the vicinity of the lead mining district. To guarantee future access for lead resource exploration, we suggest that a corridor be created from approximately Bixby to Midridge, about twelve miles wide, to be managed under MP 2.1 "General Forest." The BLM mineral staff in the Rolla office will be happy to meet with forest staff to help delineate this corridor.

The BLM would like to thank the Mark Twain National Forest for the opportunity to comment on the Forest Plan.

Sincerely,

Aaron G. Horton
Field Manager

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MAY 11 2005

11:11am From-

T-931 P.002/003 F-729

W0493

JO ANN EMERSON
MEMBER OF CONGRESS
8TH DISTRICT, MISSOURI

COMMITTEE:
APPROPRIATIONS

SUBCOMMITTEES:
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(573) 756-6755

Congress of the United States
House of Representatives
Washington, DC 20515–2508

May 2, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
P.O. Box 22810
Salt Lake City, UT 84122

CAT RECEIVED
MAY 0 3 2005

Subject: 2005 Mark Twain Forest Plan

To Whom it May Concern:

Thank you very much for the opportunity to comment on the 2005 Mark Twain Draft Revised Forest Plan. Over 80% of the Mark Twain National Forest is located in Missouri's 8th Congressional District. As the Representative for the 8th District, this new plan will greatly affect the livelihood of many of my constituents. From the timber and forest products industries to the countless number of people who come to enjoy our many parks and recreational areas, the national forest is a vital piece of the greater economic picture for the 8th Congressional District.

Timber harvesting on United States Forest Service (USFS) lands is a substantial part of Missouri's economy (4.7 billion/ annually). Therefore, I am very concerned about what a reduction in timber production from USFS land would mean to both the people I represent and the state as a whole. The reduction in federal income would also reduce federal payments made directly to counties, payments that counties rely on to provide essential services. I favor keeping the annual allowable sale quantity (ASQ) at 105 million board feet per year because it is best for forest industries, local communities, and the state.

There are several options for reaching the different goals of the five alternative long term management proposals in the revised forest plan. Almost every alternative presented by the USFS, calls for "ecosystem management" to manage most of USFS lands. This type of ecosystem management allows for the heavy use of controlled burns to mimic the historic use of fire by Native Americans to restore conditions to a time from several thousand years past. According to the proposal, this technique would create savannahs, more open woodland and restore glades. If alternative 3 were to be considered, the restoration of natural communities would be applied to over 400,000 acres. I fear that could potentially have an adverse effect on the number of acres that are allowed for timber production.

I am concerned about the lack of a plan to recycle old growth stands. While old growth allows for a desirable habitat for a variety of animals and plant species, with time, old growth stands decline and lose nearly all of their desired characteristics. Currently, it is unclear from the proposed forest plan how old growth stands, once old growth status is reached, will be managed or if more old growth stands are to be expected in the future. According to the Revised Forest Plan, some 189,499 acres (19%) may be designated to develop into "natural community" old growth over the next 100 years. It is my opinion that the addition of new old growth areas without a clear approach for long term management would have a negative impact and decrease acres suitable for timber production.

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The 1986 Forest Plan laid out a course for the regeneration of oak-hickory and pine forest. Even-aged management was relied on heavily to regenerate both pine and oaks. The proposed plan calls for a variety of silvicultural options for the renewal of national forests. I am worried that the decline of even-aged management would result in problems for the regeneration of oak-hickory species. I would caution against the use of silvicultural actions that work against the regeneration of oaks and call on the USFS to use the even-aged management process.

Another point of concern I have with the new plan pertains to threatened, endangered and sensitive species. More specifically, the Indiana Bat. I am very leery of any plan that puts the livelihood of an animal over the livelihood of hardworking people. To date, neither the U.S. Forest Service nor the other public agencies know exactly what is causing the decline. I urge caution when implementing any plans to protect the bat especially when the cause of the decline is unknown. I feel that public agencies have an obligation to provide the best science and aggressive research efforts to insure that management efforts protect existing populations and not harm the natural assets that our forests provide.

The need for flexibility in the timber industry, as with any industry, is very important. The revised 2005 Forest Plan calls for many mandated standards. Standards that are mandatory and usually limit project related functions. I feel that many of the proposed standards would be better listed as guidelines to enable the producers to use more judgment in the application of management practices.

After reviewing all of the alternatives, I believe the continuation of the 1986 plan (alternative 5) is the best option. I feel this plan provides for a sensible level of economic and social maintenance. The historical patterns of wildlife populations will remain normal. There is no change in the direction of management or major re-distribution of lands. Additionally, opportunities for recreation will remain, numerous acres of forest land will not be targeted for burning and allow for regeneration, and producers will be allowed more latitude when it comes to land management.

Thanks again for allowing me to comment on the revised 2005 Forest Plan, and I look forward to reviewing your decision.

Sincerely,

JO ANN EMERSON
Member of Congress

cc: Ronnie Raum, Mark Twain National Forest Supervisor

W 0106

Matt Blunt
Governor

Michael N. Keathley
Commissioner

State of Missouri
OFFICE OF ADMINISTRATION
Intergovernmental Relations
Post Office Box 809
Jefferson City, 65102
573/751-0337

1/28/2005

Content Analysis Team
Mark Twain Forest Plan Revision
P.O. Box 22810
Salt Lake City, UT 84122

Dear :

Subject: 0501057
EA Assistance
Environmental Assessment

The Missouri Federal Assistance Clearinghouse, in cooperation with state and local agencies interested or possibly affected, has completed the review on the above project application.

None of the agencies involved in the review had comments or recommendations to offer at this time. This concludes the Clearinghouse's review.

A copy of this letter is to be attached to the application as evidence of compliance with the State Clearinghouse requirements.

Sincerely,

Laurie Morris
Administrative Assistant

cc: Statewide

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W0755

STATE OF MISSOURI
Matt Blunt, Governor • Doyle Childers, Director
DEPARTMENT OF NATURAL RESOURCES
www.dnr.mo.gov

May 4, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
P.O. Box 22810
Salt Lake City UT 84122

Dear Team Members:

Thank you for the opportunity to comment on the Mark Twain National Forest Plan Revision and the Draft Environmental Impact Statement (DEIS). The Department of Natural Resources is the agency responsible for the stewardship of Missouri's air, land, water and cultural resources as well as the state's park system. As the state's environmental agency, we are committed to maintaining the quality of these resources for the citizens of the state and the many visitors who clearly value the natural and cultural treasures found in Missouri.

The revised plan reflects values that are consistent with the department's efforts in the management of the state's resources. We endorse an ecosystem-based approach to forest management with the focus on conserving biodiversity, addressing species viability, and improving forest health. For these reasons, we support Alternative 3, which provides for the restoration of natural communities in balance with other forest management objectives.

We have prepared our comments to the revised plan and the DEIS for your review and hope that you will find the comments both useful and constructive. Our comments address resource and ecosystem management, air and water quality, hazardous and solid waste management, and water resources.

We would also like to express our appreciation to Mark Twain National Forest Supervisor, Ronnie Raum and his staff who came to our office and shared their expertise and their vision for the future of the Mark Twain National Forest with our staff. Their presentation clarified the elements of the documents and afforded our staff an opportunity to ask questions and develop a more complete understanding of the revised plan and the DEIS.

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W0755

If you have any questions or need clarification, please feel free to contact me or Robert Stout of my staff at 573-751-3195

Sincerely,

DEPARTMENT OF NATURAL RESOURCES

Doyle Childers
Director

DC:rsj

Enclosure

c: Ronnie Raum, Mark Twain National Forest Supervisor

W0755

Mark Twain National Forest Master Plan Comments
Missouri Department of Natural Resources
May 4, 2005

General Comments

The Mark Twain National Forest includes terrestrial landscape areas critical to the preservation of biologically important landscapes and threatened and endemic species in Missouri, as identified through an ecoregional conservation planning process, facilitated by the Nature Conservancy (Ozark Ecoregional Conservation Assessment, 2003). We endorse the shift in direction in forest management to an ecosystem-based approach focused on conserving biodiversity, addressing species viability, and improving forest health.

Ecosystem Based Management

Over the past 25 years, the department has been actively involved in ecological management and restoration of natural landscapes in Missouri state parks with demonstrated beneficial results. The department co-administers the Missouri Natural Area Program, which has a 25-year record of recognizing and protecting high-quality remnants of Missouri's natural landscapes. We support Alternative 3 in the Draft Environmental Impact Statement (DEIS), which provides for the restoration of natural communities in balance with other forest management objectives. The restoration of natural terrestrial communities is in the mainstream of current conservation principles. It is appropriate that the Proposed Forest Plan incorporates restoration objectives and management prescriptions to facilitate these activities. Prescribed burning, as a management tool and primary ecological disturbance process, needs to be expanded to restore natural communities and forest health. The experience of the department is that the restoration and maintenance of natural communities requires the prescription of an ecologically appropriate fire regime over several decades to achieve the desired conditions.

We also support the discontinuation of grazing in units managed for natural community values to allow for recovery and meaningful inventory and monitoring (e.g., woodlands and glades).

Air Quality (DEIS, Chapter 3)

Proposed changes to the plan include the addition of prescriptions emphasizing restoration of natural communities and an increase in the amount of prescribed burning and fuels management. Chapter 3 of the DEIS contains the section dealing with environmental effects and discusses air quality. Prescribed burns impact criteria pollutants and visibility. Of the criteria pollutants generated by prescribed burns, the most significant is particulate matter (PM) 2.5, however other criteria pollutants are emitted as well. Fires used as part of prescribed burns release PM 2.5 into the air and also produce other precursor pollutants that can react in the air to form secondary PM 2.5. These precursor pollutants include nitrogen oxides (NOx), volatile organic compounds (VOCs), ammonia (NH3) and sulfur dioxide (SOx). All five of the management alternatives indicate large increases in prescribed fire emissions.

W0755

As shown in Table 30 of the DEIS, the estimated annual PM 2.5 emissions from prescribed burns will increase from 439 tons to 2,324 tons. This is listed in the table as an 81 percent change from current emission levels. It should be noted that this percentage increase in emissions is actually in excess of 400 percent. While we support the increase in prescribed burning as a necessary means to mediate the shift to an ecosystem-based approach, the department encourages the Forest Service to evaluate the impact on air quality when planning each prescribed burn.

In January 2005, the Environmental Protection Agency (EPA) encouraged the state to develop a smoke management plan. The smoke management plan is a critical tool to ensure that the impact on human health and air quality during prescribed burns is kept to a minimum. While neither the department nor EPA is promoting a no-burn policy, EPA is encouraging the state to establish guidelines and parameters. To address these concerns, the department is in the process of developing a smoke management plan for Missouri. An ideal smoke management plan would take into consideration the air quality impacts of the burn, such that the burn day would meet specific weather requirements and was not scheduled during certain episodic events (e.g. on days when the ozone index is red or yellow).

Staff of the MTNF has been involved in discussions on this topic. We invite Forest Service staff to continue to be involved as the SMP is developed and implemented. We would suggest that the Proposed Forest Plan be amended to indicate that the SMP will be taken into account in forest management decisions following its adoption

The department would like to note that the Hercules Glades Wilderness and Mingo National Wildlife Refuge are located within the forest and are designated as Class I with respect to air quality. The Clean Air Act defines Class I areas as "A geographic area designated for the most stringent degree of protection from future degradation of air quality."

Water Quality

The department supports the preservation and enhancement of water quality as a necessary goal of the Proposed Forest Plan. The plan has incorporated the restoration of ecosystems, proper timber harvesting techniques, restoration and protection of riparian areas, and proper management of public use. These elements should and will contribute to improvements in water quality.

We encourage the preservation and enhancement of water quality on a watershed basis. The plan addresses lands and waters only within the MTNF. The department has found from experience that unless water quality is addressed on a watershed basis working with local partners on both publicly and privately owned property, success will be limited. The Forest Service will need to address this issue in the protection of water quality in the MTNF since, in many cases, major watersheds are only partially publicly owned and managed by the USFS.

We encourage the utilization of the Best Management Practices promoted by the Missouri Forest Products Association and the Missouri Department of Conservation as critical for protecting water quality when performing timber management measures and harvests. We also discourage any large-scale clearcutting, especially in areas where water quality may be impacted as a result. We expect that any prospecting or mineral development will be done with the lowest impact possible to water quality.

W0755

The Proposed Forest Plan demonstrates a commitment to the restoration and maintenance of stream and aquatic habitat through the designation of Riparian Management Zones (RMZ) and Watercourse Protection Zones (WPZ). We encourage the establishment of these zones and the special management measures associated with those areas. As referenced in the DEIS, grazing within these zones is a primary cause of degradation of water quality in streams. We support the phasing out of grazing allotments in these zones. Cave and karst resources (including springs and fens) are afforded greater protection through the designation of management prescriptions for surrounding lands and the identification of buffer zones. The department supports the increase in the number of acres in riparian or watercourse management. The Forest Service indicates that Alternatives 1 through 4 would have the same number of acres in this management scheme, and each represents a substantial increase in number of acres in riparian or watercourse management. We are concerned that alternative 5 does not include such an increase in acreage.

We support the goal of restoring 303(d) listed waters that exist in the MTNF. We also encourage special emphasis on protecting water quality in National Scenic Riverway areas, areas designated as outstanding water resource areas, areas with unusual or high-quality hydrologic features, karst areas and groundwater resources, and stream reaches of all classes, including headwaters and small tributaries.

The DEIS identified the Black River as having potential for inclusion in the Nation's Wild and Scenic River System, in addition to rivers previously identified. If any river is included in that system, public support may also lead to designation of the river segment as an Outstanding National Resource Water, meaning that the river would fall under Tier 3 protection of the antidegradation rule pursuant to the federal Clean Water Act. That tier prohibits all new or expanded discharges directly to the designated river segment. Consequently, current permitted discharge sources would be denied any new permits that represented expanded discharges. Discharges in the tributaries to that segment would have to show through a study that their contributions would not lower the water quality in the designated segment. The department is revising the state rule on this subject to clarify that new designations, such as this, would not be applied retroactively (i.e. would not require the cessation of discharges permitted and occurring at the time of the designation).

Because timber harvest in riparian areas, karst areas and other sensitive areas has the potential to negatively impact water quality, we support the careful consideration of these conditions when the Forest Service determines whether these areas are suitable for timber production.

We would encourage the minimum density of roads practical in all prescriptions in order to reduce the acceleration of water flow that can result in runoff on roadways and the accompanying sediment or other water pollutants.

In Chapter 3 (page 200), the Forest Service refers to placement of permanent structures or new road crossings across streams in the MTNF. The department suggests that the Forest Service include references to the requirement for a 404 Permit from the U. S. Corps of Engineers and a 401 Water Quality Certification before constructing these crossings.

W0755

Solid Waste

The dumping of waste on public lands was considered the most serious solid waste disposal issue in a public opinion survey conducted in May 2004 for the department. The survey found that littering was the next most significant issue. The MTNF is vulnerable to both illegal dumping and littering due to the remote nature and high public use of forestlands. The department suggests that the Proposed Forest Plan address strategies to minimize these two illegal activities. We also propose that proper solid waste management be addressed. The department encourages the Forest Service to adopt the following three strategies to deal with these solid waste management issues.

The first strategy is to coordinate and partner with Missouri's solid waste management districts and the department's regional offices. The MTNF is comprised of seven units located within 29 Missouri counties. Each of these counties falls within a solid waste management district (SWMD). The SWMDs assist with waste reduction, recycling, proper waste management and provide information and outreach about responsible waste management practices. The department encourages the Forest Service to coordinate any waste management and recycling efforts with those districts containing units of the MTNF. The department would gladly provide any additional information related to the SWMDs as well as other information or assistance on solid waste management issues.

Second, the department suggests the Proposed Forest Plan be augmented to encourage recycling at developed recreation areas. The MTNF offers numerous recreational opportunities in a variety of settings. The department encourages the Forest Service to consider placing signage that promotes recycling. The department suggests that the Forest Service provides recycling and waste disposal containers in all developed recreation areas, especially in those areas most used such as picnic grounds, developed campgrounds and swimming areas. For those areas where such signage might detract from the recreational experience (i.e. wilderness areas, other forest roads and non-motorized trails), informational brochures regarding the recreational opportunity could encourage recycling and proper waste management on MTNF lands. The SWMDs and the department can help provide up-to-date recycling service information.

Finally, the department suggests that the Forest Service consider combating illegal dumping through the use of covert surveillance cameras. Surveillance cameras are used at various dumpsites throughout the state in an effort to enforce dumping laws, assist in the clean up of Missouri's environment and educate citizens on proper waste disposal. Within the last two years, the department has referred 36 illegal dumping cases to county prosecutors with evidence obtained from the use of surveillance cameras. As of January 1, 2005, 30 persons have been convicted and over $20,700 has been paid in restitution to the county or private landowner based on video evidence and resulting confession statements. These monies are set aside by the courts to be used to help offset the cost of cleaning up the dumpsites. For MTNF areas where illegal dumping is occurring, we encourage the Forest Service to contact the department's regional offices. Regional office staff respond to dumping complaints and conduct investigations regarding illegal dumping activities. Staff can provide information regarding the department's Illegal Dumping Surveillance Camera Program and may be contacted at (573) 751-5401 or e-mail swmp@dnr.mo.gov. The department works with local officials throughout the state to prosecute illegal dumpers. The Forest Service might find the methods developed by the department helpful in addressing illegal dumping at frequently used dumpsites in the forest.

W0755

Mining Issues

Forest Service responsibility is limited to surface activities, primarily activities associated with exploration for minerals. The U. S. Bureau of Land Management maintains responsibility and authority over federally owned minerals. The DEIS discusses research being conducted by U.S. Geological Survey (USGS) to determine the effects of mineral exploration and development on National Forest Lands. The DEIS states that the Forest Service does not want to change direction on how it currently manages its minerals program until this research is complete. The department concurs that this comprehensive study of all mining affected resources should be completed prior to making a decision to allow or disallow mining exploration and mineral extraction in the MTNF.

The Proposed Forest Plan briefly discusses a prohibition of mineral exploration in specific areas, such as the Eleven Point River. The department agrees that this decision should include or consider the study being conducted by USGS.

Appendix C of the Proposed Forest Plan discusses mineral, gas and oil leasing notices or stipulations, special notifications for lead mining operations, and conditions of approval. The department suggests that, prior to issuance of any lead mining permits, the Forest Service should fully evaluate all the details concerning transportation, materials handling and tailings disposal. These are areas where contamination can occur and this has the potential to affect human health and the environment.

Hazardous Materials

The DEIS states, "Any suspected uncontrolled or abandoned hazardous materials, sites, or contamination found on or near National Forest System lands shall be reported promptly to the Forest Service Law Enforcement and Investigation personnel." The department requests that this notification procedure should be changed to include EPA and the department as well.

The department concurs that the DEIS contains appropriate language to prohibit or restrict hazardous materials and pesticide use in MTNF. The Forest Service's procedures for application and use of pesticides should eliminate any effects on the environment.

Bird Conservation

We support the Proposed Forest Plan for the benefits that it will provide to declining bird populations and regional bird conservation efforts. The department is a participant in the Important Bird Areas Program and a member of the Missouri Bird Conservation Initiative. Natural community management centered within the Ozark Highlands, especially the restoration of glades and open woodlands, should benefit neo-tropical migrant bird species with declining population trends.

Conservation Initiatives

Because part of the Department of Natural Resources' mission is to preserve and interpret biologically significant terrestrial and aquatic resources in state parks, we endorse the management of landscape areas identified in the Ozark Ecoregional Conservation Assessment (OECA) under natural community restoration prescriptions. The OECA provides a scientific basis for delineating

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biologically significant areas. Several of our most significant state parks are included within the portfolio of aquatic or terrestrial sites, karst areas, or terrestrial landscape areas. The department is aggressive in protecting and maintaining these resources, placing a high priority on maintaining fire regimes that mimic historic patterns and controlling invasive exotic species. We support the priority given to protect threatened resources including fens that support species such as the Hine's Emerald Dragonfly.

The department shares the concern articulated in the DEIS about resource degradation created by feral hogs and deer overpopulation. These are high-priority resource management issues on lands managed by the department. Neither issue was discussed in the Proposed Forest Plan.

Wilderness Areas (DEIS, Appendix C).

We support the additions to six Wilderness Areas as outlined in the plan as described in the Roadless Area Inventory process

Developed Recreation Areas (Proposed Forest Plan pg. 3-36 Management Prescription 7.1)

We understand that both the DEIS and Proposed Forest Plan are programmatic documents and not intended to address site-specific projects. However, the Proposed Forest Plan provides a list of individual developed recreation areas that are included under Management Prescription 7.1. Based on the description of developed recreation areas provided under "Desired Condition," it is unclear why the plan includes certain recreation areas and excludes others. For example, recreation areas such as Greer Crossing, Silver Mines, Float Camp, Red Bluff, Noblett Lake and McCormack Lake that meet the criteria listed under "Desired Condition." are not included. This is not an exhaustive list of areas that would seem to have been excluded.

Both the DEIS and Proposed Forest Plan suggest a demand for more developed recreation opportunities. The DEIS reflects a slight decrease in developed recreation opportunities from the 1986 Forest Plan (pg. 3-265). It also indicates that many of the activities in which visitors participate while in Wilderness Areas are better suited to developed recreation areas (pg. 3-246) and recommends re-directing visitors to these areas (pg. 3-251). Additionally, the DEIS presents results from a recent user survey indicating that developed campgrounds are one of the five most often used facilities within the MTNF. Demand for these types of areas is expected to increase. This increasing demand is recognized in the Proposed Forest Plan, as signified by the following guideline under Management Prescription 7.1, "Locate recreation developments by giving priority to...meeting public demand" (pg. 3-37). Although the department recognizes the primitive/wilderness camping-niche filled by the MTNF, we suggest that a more even distribution of developed recreation areas, particularly campgrounds, be established throughout the units (with exception of the comparatively small Cedar Creek Unit). In addition, the department suggests that an increased emphasis be placed on maintaining existing campgrounds with significant historical preservation value (e.g., CCC structures) and/or proximity to major hiking trails (e.g., Ozark Trail).

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Designated "Special Areas" (Proposed Forest Plan pg. 3-39 Management Prescription 8.1)

The Proposed Forest Plan has established a standard that would prevent more than 660 feet of temporary openings from timber harvesting to occur along any 0.5 mile-section of the Ozark Trail during a decade (pg. 2-27). As the organizational lead for the Ozark Trail Council, the department requests the Ozark Trail be evaluated for inclusion under Management Prescription 8.1. Although not yet designated as a National Recreation Trail (NRT), the Ozark Trail is of regional and statewide significance. As trail connections are completed, a greater emphasis will be placed on nominating the trail or certain sections of the trail as a NRT. Additionally, recognizing the Ozark Trail under Management Prescription 8.1 would promote forestry best management practices along the trail corridor, ensure greater visual management protection, provide greater protection from system road crossings, and maintain the solitude of the trail experience.

The department also suggests strengthening the logging standard specific to NRTs (pg. 3-48). Currently, the Proposed Forest Plan has established a standard that would limit logging activity to leaf off periods within the near foreground of any NRT. This allows logging activity during the fall and winter months, within zero to 300 feet of the view of the trail user. The department recommends establishing a linear buffer, if possible, that would provide limits on any logging activity within a certain distance of the NRTs and the Ozark Trail, protecting the visual experience of these trails.

Dam Issues (DEIS, Chapter 3)

In Chapter 3 (page 187), the report refers to lead tailings ponds in the MTNF. The Forest Service should also include barite tailings dams in this list. Three barite tailings dams are listed in Table 40 (page 188). The Palmer, Parole, and Howell Dams are all three currently regulated by the department's Dam Safety Unit and all three are currently in good standing.

In Chapter 3 (page 188), the Forest Service states that "Current maintenance consists primarily of removal of large vegetation from the dam." This statement should also include the removal of beaver dams from the spillway control structures. Beavers are a chronic problem on these dams as they build dams that restrict flow through the spillways.

All Terrain Vehicles (ATVs) (DEIS, Chapter 3)

In Chapter 3 (page 196), the Forest Service discusses ATV use in the MTNF. While ATVs are restricted to roads or designated trails, care should be taken to prevent ATV access on the tailings dams located in the MTNF as well. ATVs should be restricted from all tailings dams as their presence will degrade the dam face and endanger the future safety of the dam structure. ATVs should be limited to certain areas of low ecological value. ATVs should be allowed for handicapped persons, work requirements and retrieving large game, etc. Uncontrolled ATV use is undesirable due to noise, damage to plants, and subsequent erosion. The department agrees with the Forest Service's identification of the need to keep ATV's out of streams and wetlands where they can have negative impacts on water quality. We support restrictions for minimal use of those vehicles in such areas.

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Literature Cited

The Nature Conservancy, Ozarks Ecoregional Assessment Team. Ozarks Ecoregional Conservation Assessment. Minneapolis, MN: The Nature Conservancy Midwestern Resource Office (2003).

W0740

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JOHN D. HOSKINS, Director

April 29, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
P.O. Box 22810
Salt Lake City, UT 84122

Ladies and Gentlemen:

The Missouri Department of Conservation (Department) appreciates the opportunity to review and comment on the Draft Revised Forest Plan (Forest Plan). The Department considers its relationship with the Mark Twain National Forest (Forest Service) to be an important partnership to protect and manage the forests of the state. The forests are one of Missouri's greatest assets both in terms of a sustainable resource and for the use and enjoyment of the people of Missouri. The Department supports the Forest Service's selection of Alternative # 3 from the Draft Environmental Impact Statement (DEIS) which is presented as the Forest Plan. This approach provides a balance between timber production and restoration of natural communities.

The Department appreciates and supports the ecosystem and natural community approach of the Forest Plan. The emphasis on the management and restoration activities of natural vegetative communities in the management prescriptions 1.1 and 1.2 is a positive aspect of the Forest Plan and is an appropriate step in creating healthy ecosystems. The Department also endorses the approach taken in further protecting streams and riparian corridors. In order for the public to understand and accept ecosystem management, a clearer description of this approach would be helpful. If this explanation is provided in the beginning of the Forest Plan it would help the reader understand the conditions of the current resources, how they are different from healthy ecosystems, and how prescribed fire and timber harvesting methods can aid in their recovery. Taking select portions from the DEIS may address this issue and allow the Forest Plan to become more of a "stand-alone" document.

The Department recognizes the value of prescribed fires along with appropriate vegetative and silvicultural practices in restoring natural communities. While the Department supports the careful use of prescribed fire, its increased use presents some important challenges for both of our agencies. Society needs to be educated about the importance of fire in creating and maintaining our native plant communities. The Forest Plan should clarify the historic role and presence of fire in Missouri's forests. The amount of prescribed fire applied to the landscape annually needs to be carefully considered. The Forest Plan calls for 60,000 acres per year to be treated using prescribed fire. This is greater than a 3-fold increase over today's prescribed fire program. This increase may present planning and resource issues for local communities and volunteer firefighters.

COMMISSION

STEPHEN C. BRADFORD, Cape Girardeau
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The forest plan should more clearly address how the increased use of fire might influence the quality of forest products. Forest products are critical for the economic health of many small towns throughout the Ozarks. The forest product industry is the third greatest economic industry in the state of Missouri. The continued involvement of individuals, groups, businesses and the public at large is an important part of a healthy forest ecosystem.

In initial meetings with the Forest Service to discuss the Forest Plan revisions, the Department was told that aquatic resource management was "not identified as needing change". The inclusion of a table and aquatic standards appears to represent a change that could significantly affect future trout management on Forest Service properties. The Department would prefer that the Aquatic section contents of the Forest Plan be removed until we have an opportunity to discuss this issue with the Forest Service and reach a mutual decision.

One of the next greatest and immediate challenges facing public natural resource agencies is non-traditional users such as ATV riders, mountain bikers, equestrian riders, rock climbers, spelunkers, etc. How the Forest Service addresses the requests of these user groups may have great influence on how the Department considers these types of requests. The Department will be interested in the results of this monitoring and looks forward to working with the Forest Service in a coordinated and responsive manner.

The success of resource management requires long-term commitment in applying specific management strategies to the landscape. Commitment must come in the form of consistent budgets, dedicated staff, and monitoring of applied activities, as well as the willingness and ability to change management approaches when conditions and information warrant. This Forest Plan reflects an ambitious departure from the current plan and may present the Forest Service with many challenges, if the commitment of resources is not adequate.

The Department congratulates the Forest Service for producing a well thought-out and written Forest Plan. The opportunity to provide comments and recommendations related to the draft Forest Plan is appreciated. Please consider the merit of these comments in revising the final document.

Sincerely,

John Hoskins

JOHN D. HOSKINS
DIRECTOR

FORWARDED FROM FS: Mark Twain Forest Plan general comments

W0600

Subject: FORWARDED FROM FS: Mark Twain Forest Plan general comments
From: FS Application Development <FSDevelopment@fs.fed.us>
Date: Thu, 5 May 2005 16:06:33 -0600
To: marktwaindeis@americanconsultants.com

"Doyle Brown"
<Doyle.Brown@mdc.mo.gov>
05/05/2005 15:18

To: <comments@marktwain.fs.fed.us>
cc:
Subject:

DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)

Abstract (both DEIS and Forest Plan)

The National Environmental Policy Act was enacted in 1969 and subsequently amended, not 1960 as stated.

Chapter 3 - page 188

Impoundments

"The excess watershield can hinder recreational opportunities by being tangled in fishing line and boat motors, but does not have a major effect on water quality or fish populations."

Please consider adding the following - Fish populations may be impacted when watershield grows to a nuisance level. Cover for young fish and aquatic invertebrates is reduced when other plants are crowded out by watershield.

Appendix B-12

"When applying the NFMA constraints, outputs for MaxASQ-NDLTSY spell this out, too
many acronyms are reduced 37 MMBF or 21 %"

DEIS SUMMARY

The DEIS Summary is really well organized and easy to understand.

1. ForestProfile

Why not include this as an opening chapter in the plan to set the stage for the goals and objectives.

2. Physical and Biological Setting; Ecosystem Management

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There also needs to be more direct discussion on how timber management might differ from the past under this new ecosystem management paradigm.

3. Alternatives.

These are well communicated and do provide a wide spectrum of alternatives. Alternative 1 is too passive. Given the extent of oak decline and the altered species composition and structure, active management will be necessary. Alternatives 4 and 5 are swayed toward traditional management and lack the new ecosystem management prescriptions.

The preferred alternative # 3 is a good selection. It contains a substantial component of the ecosystem management prescriptions, and a good balance of other prescriptions.

Draft Forest Plan Comments

Chapter 1: Goals and Objectives

1. Pg 1-2…. % of Natural Communities

Use of subsections here without any introduction to them is confusing. The % for a subsection do not add to 100. What else is being prescribed? The Central Plateau and Claypan Till Plains should have some prairie, and more savanna and open woodland than closed woodland.

2. Pg 1-3 …..Watersheds

Only 125 acres of bottomland forest restoration seems very low for a 10 year plan.

3. Pg 1-4….Fire and Fuels

Addressing the role of fire in ecosystem health here seems out of place. Perhaps this discussion fits better with the Ecosystem Health Goal.

Chapter 2 Standards and Guides

1. Pg 2-3….Riparian Management

Wet and Wet-mesic bottomland forest are largely absent from the Ozarks.

The restrictions within the RMZ and WPZ look good.

2. Pg 2-7 Key Habitats

Why are woodlands and forests not addressed as key habitats?

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4. Pg 2-20….Recreation

Guides provide a wide range of opportunities; well done.

6. Pg 2-26 and 27…..Timber Management

Indicate proportions of even or uneven-age management systems and for what purposes; and compare to last planning cycle.

Chapter 3 Management Prescriptions

These are easy to understand and do provide for a wide range of management options.

1. Pg 3-2…..Table3-1

List brief name of prescription with the number.

2. Pg 3-3….Vegetation Management in MP1.1

Why not use ELTs to indicate distribution of potential natural communities?

3. Pg. 3-4….Timber Management

Within MP 1.1 it seems like much extended rotations would be feasible, such as 150 years for Pine, Post and White Oaks, and 100 for scarlet and black.

4. Pg 3-10…..Wildlife Management.

10-15% regeneration openings…..are these even age openings??? If so, this seems high.

5. Pg 3-12, etc….Wilderness MP 5.1

Use of ECS to describe location and character is done inconsistently. For example, Hercules is described as being in the Springfield Plateau geological sub-province, and Piney Creek has no ecological context at all. Kuchler is used occasionally. Use ECS subsections and LTAs consistently.

We are supportive of the use of prescribed fire in wilderness areas where appropriate.

6. Other Presriptions are well written and adequately addressed. We are supportive of these and their intentions.

Appendix A Terrestrial Natural Communities

This section could be more inclusive of ECS and could provide a lot of the overview of current conditions up front.

1. Pg A-1…..Map

Include a legend with names of the 1.1 and 1.2 areas.

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Page A-1

Change Central ' Plataeu' to 'Plateau'

Page A-4

Big CreekBasinGlades

Add 'Open' or 'Closed' or both to Post Oak/Black Oak Dry Chert Woodland near the middle of the page.

Page A-9

Under Management Prescription 1.2- first sentence, change '1.1' to '1.2'.

General: we are very supportive of the 1.1 and 1.2 MP's. They compliment many of the COAs identified by our CWS assessment process. The use of ECS to describe the areas could be more consistent; and the use of ELTs to identify potential natural community distribution could be addressed, at least in the future.

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JOHN D. HOSKINS, Director

April 29, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
P.O. Box 22810
Salt Lake City, UT 84122

Dear Analysis Team:

The following comments and information is in response to your request to the proposed revised Forest Plan, Mark Twain National Forest, Missouri.

Threatened, Endangered, and Sensitive Species (TES): The Mark Twain National Forest boundary contains a large amount of stream footage with hellbenders; especially Big Piney River, lower Current River, and Eleven Point River. Although in most cases (e.g. riparian zone protection) Ozark and Eastern Hellbenders are quite protected on Mark Twain National Forest, I would suggest additional language for these two subspecies.

- Conduct an evaluation for the presence of Ozark and Eastern Hellbenders prior to any decision to remove a river bridge and other materials from the water.
- Conduct an evaluation for the presence of Ozark and Eastern Hellbenders prior to the construction of public accesses. Access locations should not be placed directly on known hellbender locations.
- Avoid channel alterations or impoundment structures that eliminate shallow water or remove cover rocks.
- Erosion and sediment controls should be implemented to reduce siltation.
- Avoid in-stream gravel mining where hellbenders occur.
- Continue to enforce existing regulations and increase investigative leads of the illegal collecting of hellbenders.

Wildlife Watering Holes: I am concerned about the future of wildlife watering holes on the Mark Twain National Forest, which are used by numerous amphibian species. Of the 5,743 known amphibian species in the world, 32 % are declining (IUCN, 2004). Majority of the declines are attributed to habitat loss, habitat alterations, and/or introduction of non-native invasive species. In general most amphibians have low dispersal mechanisms and are influenced by habitat fragmentation. Fortunately, the

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state of Missouri, especially Mark Twain National Forest, contains vast amount of lands that are suitable for amphibians. However, if ponds are de-emphasized on the Mark Twain National Forest, undoubtedly amphibian biodiversity and abundance will decline.

From my understanding, the current language in the plan indicates that wildlife watering holes can be constructed only in areas where natural or human-make water sources are limited or lacking in certain management prescription areas (Chapter 2). In other management prescription areas (Chapter 3), language indicates that no new wildlife ponds shall be constructed. However, wording does not indicate if these wildlife ponds will be renovated or replaced in the future. Hopefully, the USFS will continue to construct ponds where necessary and replace existing ponds as the need arises.

Also, I have noticed that temporary pools were removed from the plan. I am not for sure if the wording of waterholes and wildlife ponds incorporate both permanent and temporary water sources on the Forest. Permanent ponds are beneficial for approximately 20 species of amphibians in the Ozarks. By far, temporary pools are even more important to amphibians on the landscape. Although amphibian species richness use of temporary pools is similar to permanent watering holes, relative abundance of these species are much higher in temporary pool. This is mainly due to the fishless nature of these pools compared to permanent water.

Some individuals believe that we have artificially increased amphibian abundance in the Ozarks due to pond construction. However, I strongly disagree with such an assessment for the following reasons:

- Beaver: Historically beaver population was large compared to recent times. It was estimated in primitive times that 60 million beavers occurred in North American (approximately 50 per square mile). Schwartz and Schwartz (2001) reported beavers were common in every watershed in Missouri prior to the Civil War, but dropped significantly in the late 1880's. Even with some introductions in Missouri, beaver populations in some areas remained relatively low today. Throughout the Ozarks, beavers would create a variety of wetlands that were used by amphibians for breeding (e.g. Carman Spring). In addition, many agencies today readily destroy beaver dams in order to save a fen or reduce the lost of trees. Undoubtedly the reduction of beavers and practice of destroying beaver dams has limited the number of natural breeding sites for amphibians.

- American Bison: American bison were known to migrate and forage throughout the Ozarks in vast numbers. They are known to produce "wallows" to dust themselves to remove insects, parasites, and/or cool their bodies. Overtime these wallows will get deeper and fill with water in late winter and early spring; thus, provided excellent breeding sites for amphibians. There is really no way to known how many of these wallows existed on the landscape, but undoubtedly they had to occur. For example on Prairie State Park, a herd of approximately

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100 bison's have created numerous wallows in a short time period. Again, this illustrates another means of losing natural wetlands across the landscape used by amphibians.

- Tree root depression: While working for the Ozark National Forest in the late 1990's, I discovered an unusually and often overlooked natural breeding site for amphibians. A tornado ripped through a section of the Ozarks that caused many trees to blow over. This created numerous small depressions (approximately 2 to 3 feet deep and 4 to 5 feet in diameter depending on tree size). Many of these root depressions immediately filled with water. In a short amount of time, numerous amphibian species were depositing eggs among roots in the water. Again it is hard to determine how many of these sites existed in an area, but unfortunately today trees are harvested well before they would fall to the ground and create such a natural breeding site for amphibians.

- Other sites: Other sites used by amphibians in the Ozarks include natural sinkhole ponds, fens, small pools along bluffs and even some flat areas on ridge tops and flat benches. In most cases, sinkhole ponds and fens are relatively protected today, especially those that exist on public lands. However, a lot of these sites have been destroyed on private lands. In addition, temporary pools, which are usually small in size and ephemeral in nature, are easily overlooked and destroyed. These ephemeral wetlands have their place on the landscape, and deserve equal consideration and protections.

In reality, a lot of natural ponds or pools used by amphibians in the Ozarks have been lost or greatly reduced in numbers. Due to the lost of natural wetlands and the inability for most amphibians to cross fragmented landscapes, we must continue to provide alternative water sources (both permanent and temporary) to maintain amphibian biodiversity in the Ozark.

Also, I would like to provide some additional information that might be useful for amphibian management on the Mark Twain National Forest. Excellent amphibian management information can be found in "Amphibian Conservation" by Semlitsch (2003).

- Constructed Waterholes and Wildlife Ponds (Chapter 2 page 2-13): You might want to consider adding---where feasible fish will be removed from ponds to promote amphibian use.

- Buffer Zones: In most cases, a 100 foot buffer zone is used as a common management tool throughout the Forest Plan to protect natural wetlands (fens, sinkhole ponds, etc.), caves, karst features, etc. First, I would recommend this zone be increased to 200 meters for natural sites (wetlands) used by amphibians. It is known that approximately 95 % of salamanders using a

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breeding site live within this distance from the breeding location (Semlitsch, 1998; Semlitsch and Jensen, 2001). I believe this buffer should be protected from clear cuts and rotational tree harvest as indicated by Semlitsch and Rothermel (2003) be incorporate to maintain the wooded habitat overtime. I would also recommend that artificial sites also receive a buffer zone, especially locations that contain species of conservation concern. If not, these locations should maintain some connectivity to wooded landscapes by following recommendations by Semlitsch and Rothermel (2003).

- Prescribed Burning: Amphibians require moist areas, which mainly occur on north-facing slopes with plenty of leaf litter. By no means am I opposed to burning, especially based upon burning history. Information provided by R. Guyette tree scar data showed that on average south slopes burn 3 to 4 times the rate of north-facing slopes (for every 4 burns on south-facing slope, there will be 1 burn on the north-facing slope). Direct mortality on most amphibians from fire is probably much reduced due to these species are either below ground, in wetlands, or under cover objects. If burning on north-facing slopes occurs at frequencies much higher than the natural rate and the canopy is reduced on these north-facing slopes then amphibians will be negatively affected due to the decreased soil moisture levels. Hopefully, this is considered when burning such areas. Also, we should continue to promote the policy that if it does not burn, we should not re-ignite. A good mosaic burn is probably most beneficial to numerous species, especially those that cannot escape approaching fires.

I want to thank you for the opportunity to provide input on the Forest Plan. With continued support by Mark Twain National Forest, National Park Service, Department of Natural Resources, Missouri Department of Conservation, and Fish and Wildlife Service, hopefully amphibians will continue to persist and increase on these protected lands in Missouri.

If you have additional comments or questions, please feel free to contact me by phone (573/522-4115 ext 3201) or e-mail (jeff.briggler@mdc.mo.gov).

Sincerely,

Jeff Briggler

Jeff Briggler
Herpetologist

Cc: Jodie Eberly (USFS), Doyle Brown (MDC-Policy Coordination)

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Literature Cited

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W0727

MISSOURI SENATE
JEFFERSON CITY

FRANK A. BARNITZ
SENATOR, 16TH DISTRICT

May 5, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
P. O. Box 22810
Salt Lake City, UT 84122

Content Analysis Team:

I am State Senator Frank A. Barnitz and represent the 16th Senatorial District of the 93rd General Assembly (2005-2006) of the State of Missouri. I offer the following comments concerning the Revised Draft Plan for the Mark Twain National Forest.

While the Ozark region as other areas of this state are largely impacted with customary agriculture, there is an expansive amount of the area that is in timber. Just recently being recognized as an important economic stimulus to rural Missouri, timber is on its way to being used in more and more beneficial ways. This is why I find it important to write and address the Mark Twain Forest Plan provisions.

I would be disappointed to see that the amount of timber harvests be reduced below the figure of 105 million board foot per year. In connection with the afore mentioned I think it would not be a positive management decision to reduce the acres of production timber by any amount but especially the expressed desire of reduction of 319,000 acres.

In the area of this plan mixed hardwoods (especially oak and hickory) and a limited amount of pine dominate the acres. I would oppose the management of these areas for the promulgation of other species that are not as desirable.

I would hope that management decisions be based on current or future needs and also on new innovative ways to sustain production and use of the Mark Twain Forest.

Sincerely,

Frank A. Barnitz

Frank A. Barnitz
State Senator
District 16

C: Mr. Ronnie Raum
Mr. Randy Moore
Missouri Forest Products Assn.

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Mike Dethrow, Chairman
State Representative, District 153

Frank Barnitz, Vice Chairman
State Senator, District 16

MISSOURI FOREST PRODUCTS CAUCUS

Contents Analysis Team
Mark Twain Forest Plan Revision
Post Office Box 22810
Salt Lake City, UT 84122

On behalf of the Missouri Forest Products Caucus of the 93rd General Assembly (2005-2006), we are submitting our Position Paper representing our position on the Draft Revised Forest Plan for The Mark Twain National Forest.

As you will conclude from our comments, we have serious concerns about some of the Alternatives proposed for the future management of the Mark Twain National Forest, especially the adoption of any alternative that would restore historical conditions dating back to 10,000 BC and up to the 18th century. We also strongly support maintaining the ASQ at 105 million bd. ft. per year, and would encourage the US Forest Service to adopt a more vigorous timber harvesting program to meet the ASQ level called for in the current plan by marketing more "green" wood and by the salvage of trees impacted by Oak decline.

Frank A. Barnitz

Frank Barnitz
Vice Chairman
State Senator
District 16

Mike Dethrow

Mike Dethrow
Chairman
State Representative
District 153

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Mike Dethrow, Chairman
State Representative, District 153

Frank Barnitz, Vice Chairman
State Senator, District 16

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Representative Will Kraus, District 48

Representative Jim Whorton, District 3

Representative Curt Dougherty, District 53

Representative Jim Guest, District 5

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Representative Fred Kratky, District 65

Representative John Quinn, District 7

Representative Kathlyn Fares, District 91

Representative Wes Shoemeyer, District 9

Representative Brian D. Nieves, District 98

Representative Terry Witte, District 10

Representative Mike Sutherland, District 99

Representative Wayne Henke, District 11

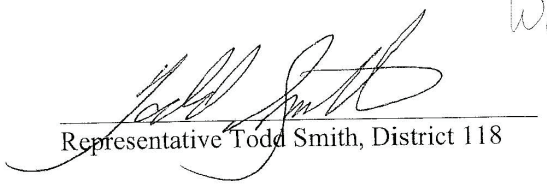
Representative Belinda Harris, District 110

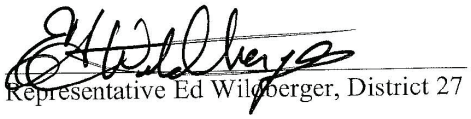
Representative Steve Hobbs, District 21

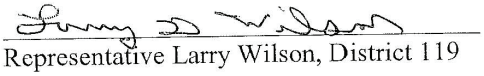
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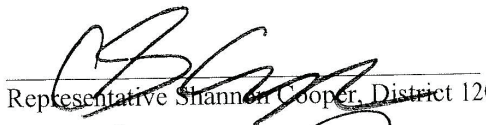
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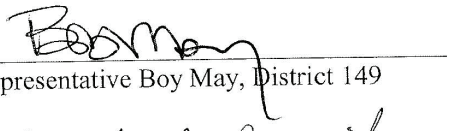

Representative Therese Sander, District 22

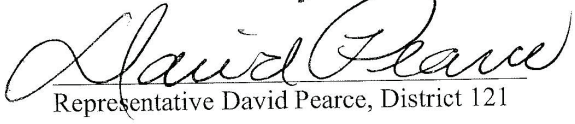

Representative Todd Smith, District 118

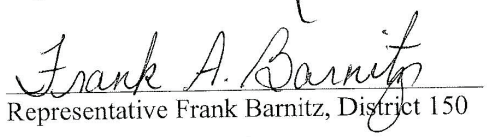

Representative Ed Wildberger, District 27


Representative Larry Wilson, District 119

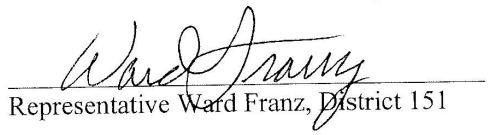

Representative Shannon Cooper, District 120


Representative Boy May, District 149

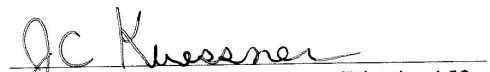

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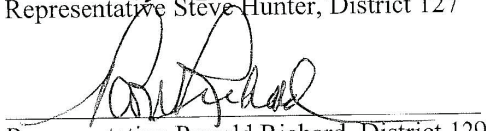

Representative Frank Barnitz, District 150

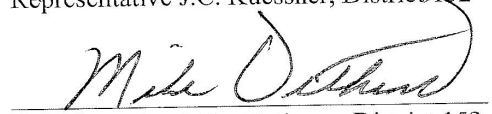

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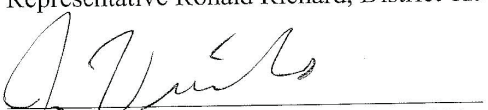

Representative Ward Franz, District 151

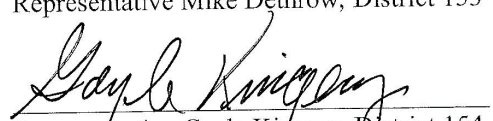

Representative Steve Hunter, District 127

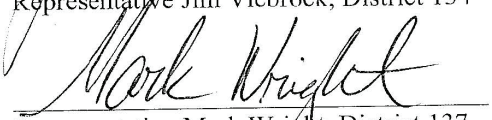

Representative J.C. Kuessner, District 152

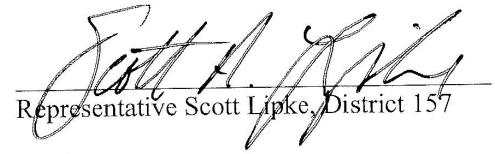

Representative Ronald Richard, District 129

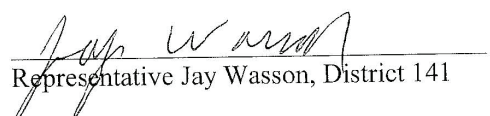

Representative Mike Dethrow, District 153

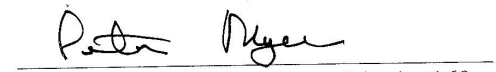

Representative Jim Viebrock, District 134

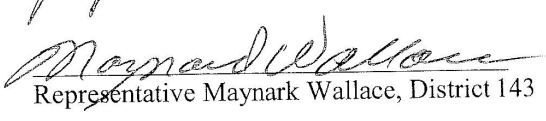

Representative Gayle Kingery, District 154

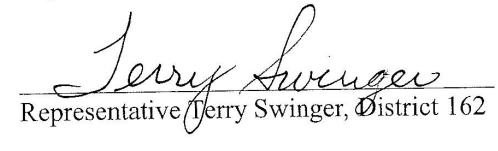

Representative Mark Wright, District 137


Representative Scott Lipke, District 157


Representative Jay Wasson, District 141


Representative Peter Meyers, District 160


Representative Maynark Wallace, District 143


Representative Terry Swinger, District 162


Representative Mike Cunningham, District 145


Representative Otto Bean, District 163

W0384

Representative Darrell Pollock, District 146

Representative Bill Deeken, District 114

Representative David Day, District 148

W0384

Position Paper
of the
Missouri Forest Products Caucus
93rd General Assembly
State of Missouri
concerning the
2005 Draft Revised Forest Plan
for
The Mark Twain National Forest

W0384

The Missouri Forest Products Caucus of the 93rd General Assembly of the State of Missouri has adopted the following position concerning the 2005 Draft Revised Forest Plan recently published for public review by the US Forest Service.

Abstract

In 1986, the United States Forest Service (USFS) adopted a plan that would guide management activities for the Mark Twain National Forest for the next 15-20 years. Federal law requires the plan be revised every 20 years. The USFS recently released for public review a revised plan in which some five different management alternatives were proposed. These alternatives ranged from no timber harvest (alt. 1) to a continuation of current management direction provided in the existing (1986) plan. Timber management is the primary means for meeting desired objectives, including timber production for local forest industries. Alternatives 2, 3 and 4, propose a mix of management activities and levels of timber harvest. Alternative 5 proposes a continuation of the 1986 plan.

The following comments expresses the position of the Forest Porducts Caucus in regard to the various forest-wide goals and objectives proposed in the revised plan.

- Timber Production

The long term management of the Mark Twain National Forest is very important to the Forest Products Industry of Missouri as well as to the economy of some 29 Missouri counties where National Forest lands are located. Further, the many forest products that are produced from timber that is harvested from USFS lands also contributes substantially to the economy of the entire state ($4.7 billion/year). Therefore, any reduction in timber production (harvest) from USFS land could have an adverse impact on both the local and state-wide economy. Reduced Federal income could also impact Federal payments made directly to counties. Therefore, keeping the average annual allowable sale quantity (ASQ) at a level of at least 105 million bd. ft. per year is necessary to insure a continued harvest of forest products necessary to support forest industries and our economy.

Our Caucus does not support lowering the ASQ below the 105 million bd. ft. per year level.

- Management Prescription

The USFS proposes a variety of management prescriptions to reach various goals and objectives of the five (5) different alternative long term management proposals in the proposed revised plan. In virtually every alternative, the USFS proposes to apply an ecosystem management approach to manage most of USFS lands.

Ecosystem management focuses heavily on restoring natural communities and will rely heavily on the use of fire to mimic historical disturbance processes under which Natural Communities evolved. Such fire would also mimic the historic use of fire by Native Americans

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and focus on restoring conditions that may have existed over the past several thousand years (10,000 BC) and up until the late 18th century. By using fire, the USFS would create savannahs, more open woodland and restore glades. Overall, in the USFS preferred Alternative 3, management prescriptions to restore natural communities would by applied to over 400,000 acres. We believe the USFS should be extremely careful in using historical information from one date or time period as a reference for present or future conditions, and worse yet, using such historical information dating back several thousand years as a basis for selecting management prescriptions that will control management direction for the next 20 years.

Our Caucus doe not support the concept of ecosystem management and do not support any Alternative where this concept would be applied.

- Use of Fire

We support the use of prescribed fire, but only on a limited basis and for very limited uses. However, we note that the USFS proposes to use fire in every proposed alternative. However, in some alternatives, several thousand acres would be burned over the life of the plan, from a low of 593,000 to a high of 724,000 acres.

Our Caucus does not support such extensive proposed use of fire. We support the Healthy Forest initiative, including the use of fire to reduce hazardous fuel, but wonder if the USFS is using the Initiative on a much broader basis than is justifiable. Perhaps as our Caucus has future opportunities to review specific proposals to use fire, we will have more information to base our opinion. We also support some limited use of fire for Wildlife habitat improvement and preparation of seed beds for natural regeneration of Shortleaf pine. We generally oppose the application of fire to all Oak stands.

- Forest Regeneration

The USFS is fortunate that our Oak-Hickory climax forests are renewable and generally so with a minimum of effort and expense. Also, while comprising a very small component of our natural forest lands, Shortleaf pine can also be regenerated by natural regeneration practices.

The 1986 Forest Plan called for emphasis on the regeneration of our Oak-Hickory and pine forest. Even-aged management dominated the process to regenerate both our pine and oaks. However, it appears from USFS records that the use of even-aged management drastically tapered off during the last few years of the 1986 plan.

The proposed 2005 plan provides for a variety of silvicultural options to renew our National Forests. We are concerned that, if the decline in the use of even-aged management continues, such decline will result in severe problems for the regeneration of Oak-Hickory species.

Our Caucus is opposed to the application of Silvicultural systems that discriminates against the regeneration of Oaks and we urge the USFS to use the even-age management process

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to manage our Oak-Hickory forests.

- Old Growth

Unfortunately, there are too many strong opinions about old growth to allow any general agreement as to how to create, maintain and renew an old growth component of the Mark Twain Nation Forest. Here again, we urge caution in "using historical information as a reference for the present or future".

Our primary concern about designating from 11% to 19% of USFS land to be in a "Natural Community" old growth over the next 100 years is that the USFS plans on old growth stands to grow old, break up and die. For all practical purposes, old growth timber will never be harvested or salvaged. If some 19% of the forest suitable for timber would be designated over the next 20 years, some 189,449 acres would be taken out of production.

We have not been able to determine from the proposed forest plan, how old growth stands, once they no longer have desired old growth characteristics, will be managed and if additional old growth stands are to be added in the future.

Our Caucus opposes the designation of additional old growth areas until the USFS is able to more clearly establish a reasonable approach for the long term management of old growth areas.

- Acres Suitable for Timber Production

In 1986, out of 1,461,600 acres of National Forest land in Missouri, 1,282,500 acres were designated as suitable for Timber Production. A 2004 analysis indicated that, out of a total of 1,496,100 acres, only 997,100 acres are suitable for Timber Production, or a reduction of 319,800 acres, a 22% reduction. If this trend should continue, there would be little, if any, timber suitable for Timber Production by the year 2080.

Our Caucus is opposed to reducing acres suitable for timber harvest, especially acreage designated to be old growth.

- Threatened, Endangered and Sensitive Species

We understand that Federal law may mandate how Public Agencies must manage for Rare, Endangered, Threatened or Sensitive species. We feel, however, that Public Agencies have an obligation to provide the best science available and, in the absence of such science, propose aggressive research efforts that will insure that management efforts to protect existing population or recover declining populations are proper and do not unduly impact other amenities provided by our National Forest.

Our Caucus opposes any restrictions that will be placed on timber management activities, especially harvesting related to the management of rare, endangered, threatened or sensitive

W0384

species, especially the Indiana Bat. Our opposition is based on the fact that no Public Agency in Missouri, involved with Indiana bat recovery activities knows exactly what has caused the steady decline in Indiana bat population over the past 20 years.

- Standards and Guidelines

The USFS uses Standards and Guidelines to provide a course of action as the USFS applies each management prescription. Standards provide a course of action or level of attainment that must be reached to achieve Forestwide goals. Standards are mandatory. Guidelines is a course of action that should be followed in most cases, but are not mandatory. Guidelines allow for some flexibility, Standards do not.

Proposed revised 2005 Forest Plan calls for many mandated standards. We believe that many of the proposed standards mandate specific activities that would offer much more flexibility if covered under guidelines, especially in all areas of timber management.

Our Caucus opposes the preponderance of mandated standards in the proposed revised plan and we urge the USFS to use more guidelines that will allow more discretionary (judgement) guidance in the application of management practices.

Please note that in our comments that we have not commented as to our preference of any proposed alternative.

Our Caucus is opposed to Alternative 1 since it provides for no timber harvests.

As a result of our review, we find no compelling reason to support Alternatives 2, 3 and 4. We believe a continuation of the 1986 plan will provide a reasonable level of economic and social sustainability. Wildlife populations will remain viable and distributed in historical patterns. There will be no major changes in management prescriptions or drastic re-allocation of lands. Opportunities for recreation are not reduced, especially hunting and fishing. Large acreages of forest land will not be burned and fire will only be used sparingly. Existing Heritage resources will continue to be protected and no wilderness areas are recommended for study. Current Forest Plan Standards will protect existing Wild and Scenic Rivers and there will be no appreciable changes to road systems and restriction of motorized access to the Mark Twain National Forest.

Our Caucus is of the opinion there is no need for the USFS to change the direction of management on the Mark Twain National Forest. We urge the USFS to continue with the 1986 plan.

W0384

We thank the USFS for making the 2005 Revised Forest Plan available for our review and appreciate the opportunity to make our comments.

We look forward to being advised as to the Final Environmental Impact Statement (FEIS) which will indicate the selection of the preferred alternative, Revised Forest Plan and Record of Decision which are expected in September 2005.

W0737

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MIKE DETHROW
State Representative
District 153

May 5, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
P.O. Box 22810
Salt Lake City, UT 84122

TO WHOM IT MAY CONCERN:

I am in support of continuing the forest management practices outlined under alternative number five (5). Alternative 5 calls for The Mark Twain National Forest to continue to be managed by the guidelines adopted in the 1986 plan. This plan will ensure the best mix of timber production, recreation and wild life management without resorting to additional mandates, restoring pre-settlement conditions or increasing old growth forests.

Commonsense management of Mark Twain National Forest is important to the citizens of Missouri's 153rd District. I appreciate your careful consideration of these comments as you develop forest management strategies for the future.

Sincerely,

Mike Dethrow
State Representative
District #153

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Vice Chairman-Conservation & Natural Resources
Appropriations-Transportation & Economic Development

W0736

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Barney Fisher
State Representative
District 125

May 5, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
Post Office Box 22810
Salt Lake City, UT 84122

Dear Content Analysis Team,

I am writing to express my opposition and concerns regarding the Revised Draft Plan for the Mark Twain National Forest.

- I am concerned about any reduction in the amount of timber that can be harvested each year from USFS lands. I oppose any reduction from 105 million bd. ft. per year.
- The USFS is proposing to reduce the number of acres that are suitable for timber production by 319,000 acres. I am opposed to this proposed reduction since this reduction also impacts the ASQ.
- I oppose the concept of Ecosystem Management and plans to restore conditions that may have existed back as far as 10,000 BC up to the late 18th Century, since this would reduce, overall, the amount of timber that could be grown on many acres.
- I am opposed to burning several hundred thousand acres to accommodate restoration. We believe such burning will cause considerable damage to our Oaks and, in some cases, Pines.
- I am opposed to restrictive management activities for the protection of rare plant and wildlife species, such as the Indiana bat, when the USFS apparently does not know what has caused the decline of the bat.
- I oppose the adoption of more mandated standards that will not allow any reasonable judgment in the application of management practices, especially timber sales.
- I am opposed to regeneration practices that do not favor oak and pines. We recommend more use of even-aged practices for our oaks and pines.
- I am opposed to Alternatives, 1,2, 3 and 4 and support Alternative 5, which would allow management of the Mark Twain Forest to be managed as mandated in the current 1986 plan.

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Content Analysis Team
Page 2
May 5, 2005

Many of my fellow Missouri State Representatives and Senators share the same views listed above. Please give all due consideration to those views when formulating any plan relating to Missouri forests and forest products.

Respectfully,

Barney Fisher

BF/br

cc: Mr. Ronnie Raum, Forest Supervisor
Mr. Randy Moore, Eastern Region Office

W0797

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J.C. Kuessner
State Representative
District 152

May 4, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
Post Office Box 22810
Salt Lake City, UT 84122

I am Representative J.C. Kuessner from the 152nd District, Missouri House of Representatives, 93rd General Assembly and would like to comment on the Draft Revised Forest Plan for the Mark Twain National Forest.

I am concerned about any reduction in the amount of timber that can be harvested each year from USFS lands. I oppose any reduction from 105 million bd. ft. per year.

The USFS is proposing to reduce the number of acres that are suitable for timber production by 319,000 acres. I am opposed to this proposed reduction since this reduction also impacts the ASQ.

I oppose the concept of Ecosystem Management and plans to restore conditions that may have existed back as far as 10,000 BC up to the late 18th Century, since this would reduce, overall, the amount of timber that could be grown on many acres.

I am opposed to burning several hundred thousand acres to accommodate restoration. We believe such burning will cause considerable damage to our Oaks and, in some cases, Pines.

I am opposed to restrictive management activities for the protection of rare plant and wildlife species, such as the Indiana bat, when the USFS apparently does not know what has caused the decline of the bat.

I oppose the adoption of more mandated standards that will not allow any reasonable judgment in the application of management practices, especially timber sales.

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Content Analysis Team
Page 2
May 4, 2005

I am opposed to regeneration practices that do not favor oak and pines. We recommend more use of even-aged practices for our oaks and pines.

I am opposed to Alternatives 1, 2, 3 and 4 and support Alternative 5, which would allow management of the Mark Twain Forest to be managed as mandated in the current 1986 plan.

Sincerely,

J.C. Kuessner

J.C. Kuessner, Chairman
Forest Utilization Committee

cc: Ronnie Raum, Forest Supervisor
Mark Twain National Forest

Randy Moore
Eastern Region Office

WO796

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PETER C. MYERS, Sr.
State Representative
District 160

Committees

Agriculture Policy, Chair

Appropriations-Agriculture and Natural Resources

Budget

Utilities

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May 4, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
Post Office Box 22810
Salt Lake City, UT 84122

Content Analysis Team:

I am Representative Peter Myers and represent the 160th district of the 93rd General Assembly (2005-2006) of the State of Missouri. I offer the following comments concerning the Revised Draft Plan for the Mark Twain National Forest. I am concerned about the following:

- Any reduction in the amount of timber that can be harvested each year from USFS lands. I oppose any reduction from 105 million bd. ft. per year.
- The USFS is proposing to reduce the number of acres that are suitable for timber production by 319,000 acres. I am opposed to this proposed reduction since this reduction also impacts the ASQ.
- I oppose the concept of Ecosystem Management and plans to restore conditions that may have existed back as far as 10,000 BC up to the late 18th Century, since this would reduce, overall, the amount of timber that could be grown on many acres.
- I am opposed to burning several hundred thousand acres to accommodate restoration. We believe such burning will cause considerable damage to our Oaks and, in some cases, Pines.
- I am opposed to restrictive management activities for the protection of rare plant and wildlife species. such as the Indiana bat, when the USFS apparently does not know what has caused the decline of the bat.
- I oppose the adoption of more mandated standards that will not allow any reasonable judgment in the application of management practices, especially timber sales.
- I am opposed to regeneration practices that do not favor oaks and pines. We recommend more use of even-aged practices for our oaks and pines.
- I am opposed to Alternatives 1,2,3 and 4 and support Alternative 5, which would allow management of the Mark Twain Forest to be managed as mandated in the current 1986 plan.

Sincerely,

Peter C. Myers, Sr.

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MISSOURI HOUSE OF REPRESENTATIVES
Darrell Pollock
State Representative
District 146

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May 4, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
Post Office Box 22810
Salt Lake City, UT 84122

To Whom It May Concern:

I represent the 146th district of the 93rd General Assembly (2005-2006) of the State of Missouri and a portion of the Mark Twain National Forest is in my district. I am very concerned about the Revised Draft Plan for the Mark Twain National Forest.

The proposal to reduce the number of acres that are suitable for timber production by 319,000 acres will have a negative affect on our forest products. This fact in conjunction with the possibility of burning several hundred thousand acres to accommodate restoration that will cause damage and a decline in our Oaks and Pines is something I don't believe our State and forest industry can afford. We need to allow for a reasonable judgment in the application of management practices, especially timber sales.

I strongly encourage you to reconsider your plan for the Mark Twain National Forest.

Sincerely,

Darrell Pollock
State Representative
District 146

Cc: Mr. Ronnie Raum
Mr. Randy Moore

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W0349

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JOHN QUINN
State Representative
District 7

DATE: April 19, 2005

TO: Mark Twain National Forest Plan Revision

FROM: Representative John Quinn

As an elected State Representative from the 7th District, I would like to comment on the Draft Revised Forest Plan for the Mark Twain National Forest.

! Timber Production

Timber production from the Mark Twain National Forest is a vital source of wood for many of our Forest Products Industries of Missouri. Any reduction in timber production will have a negative impact on these industries and our State economy as well. I do not support any reduction in the current average annual allowable sale quantity (ASQ) of 102 million bd. ft. per year.

! I do not support any management alternative that would use an ecosystem management approach to restore natural communities, especially our timber, to conditions that would mimic conditions that may have existed as for back as 10,000 BC and up to the end of the 18th century.

! I support the use of Prescribed fire on a very limited basis, but do not support the use of fire on some 724,000 acres as called for in some of the proposed alternatives. I believe that fire use, such as proposed, would be very costly and damaging to our existing oak-pine forests that are already suffering from previous fire damage.

! Our oak-pine forest are renewable and sustainable with a minimum of cost and effort if properly managed, preferably by an even-aged management process. I am opposed to any other process that will discriminate against the regeneration of our black, scarlet, red and white oak forests.

! I am opposed to designating any additional forested areas to Old Growth, especially some 189,449 acres as proposed in your plan. Old growth will never be salvaged or harvested and is difficult and expensive to renew as a oak or pine component of the forest.

! The proposed plan calls for reducing land suitable for timber production by 319,000 acres, a reduction of 22% or almost one-quarter of the current timber producing component of the Forest. I am opposed to this reduction, especially removing acres to

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create old growth stands.

- The proposed plan proposes mandating many more Standards that takes away opportunities for flexibility and judgment as our forests are managed on a day to day basis. I am opposed to all the proposed additional mandates.

- I am opposed to placing restrictions on timber management activities for the protection of the Indiana bat, since the USFS and other public agencies apparently do not know what is the cause of the decline in bat populations.

After reviewing your proposed plan, I am opposed to Alternatives 1, 2, 3 and 4. I support Alternative 5 which would call for the Mark Twain National Forest to continue to be managed by guidelines adopted in the 1986 plan.

Continued use of the 1986 plan will ensure the best mix of timber production, recreation, wildlife management and protection of sensitive areas and plant and animal species.

W0734

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rrichard@services.state.mo.us

Ron Richard
Missouri House of Representatives
District 129

COMMITTEES

Chair:
Job Creation & Economic Development

Joint Committee on Economic Development Policy and Planning

Member:
Financial Institutions

Rules

May 4, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
Post Office Box 22810
Salt Lake City, UT 84122

I am Representative Ron Richard of the 129th District of the 93rd General Assembly (2005-2006) of the State of Missouri. I offer the following comments concerning the Revised Draft Plan for the Mark Twain National Forest.

I am in support of continuing the management practices of the past 20 years. The Mark Twain National Forest is a vital part of Missouri's tourism industry and that directly affects Missouri's economic development. As Chairman of the Job Creation and Economic Development Committee in the House of Representatives, I am very concerned about changes to an established, well-working piece of Missouri's heritage.

Thank you.

Ron Richard, Chairman
Job Creation and Economic Development Committee

cc: Mr. Ronnie Raum, Forest Supervisor
Mr. Randy Moore, Eastern Region Office
Representative Mike Dethrow
Mr. Bob Wilson

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MAY 11 2005

FORWARDED FROM FS: Mark Twain Forest Mgmt Comments.doc

W0360

Subject: FORWARDED FROM FS: Mark Twain Forest Mgmt Comments.doc
From: FS Application Development <FSDevelopment@fs.fed.us>
Date: Thu, 21 Apr 2005 13:05:31 -0600
To: marktwaindeis@americanconsultants.com

"Therese Sander" <Therese.Sander@house.mo.gov>
Sent by: "Wilma Rowden" <Wilma.Rowden@house.mo.gov>

To: <comments@marktwain.fs.fed.us>
cc:
Subject:

04/21/2005 12:15

Date: April 21, 2005

To: Content Analysis Team

From: Representative Therese Sander

Subject: 2005 Revised Plan for Mark Twain National Forest

As an elected State Representative from the 22nd District, I would like to make the following comments on the Draft Revised Forest Plan for the Mark Twain National Forest.

1)2)3)4)5)6)7)guidelines afford some flexibility and discretionary judgment

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in application of management practices. Moving to Standards on the other hand, means moving to a mandatory course of action or level of achievement and allows for no flexibility, commonsense, or good judgment to be applied when circumstances warrant it. I am opposed to mandatory standards.

8)9)

Sincerely,

Representative Therese Sander

22nd District State Representative

W0468

John Broadhead

From: "FS Application Development" <FSDevelopment@fs.fed.us>
To: <marktwaindeis@americanconsultants.com>
Sent: Tuesday, May 03, 2005 10:04 AM
Attach: image001.wmz; header.htm; oledata.mso
Subject: FORWARDED FROM FS: 2005 Revised Forest Plan

"David Sater" <David.Sater@hous e.mo.gov> Sent by: "Sid Blount" <Sid.Blount@house .mo.gov>

To: <comments@marktwain.fs.fed.us>
cc:
Subject:

05/03/2005 08:53

May 3, 2005

Content Analysis Team

Mark Twain Natl. Forest Plan Revision

PO Box 22810

Salt Lake, UT 84122

Re: 2005 Revised Forest Plan

Mark Twain National Forest

To Whom It May Concern:

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5/3/2005

W0468

I am a State Representative from the 68th District, and the Mark Twain National Forest is in my county of Barry. The forest has been enjoyed by our citizens for hunting, biking, wildlife observation, and hiking for many years. It also serves as a source of timber thatis harvested at times. Wise management is essential to prevent erosion and damageto the environment. There is a balance that should be in effect on environmental concerns, the enjoyment of the forest by our citizens, and timber producers.

I do not support any reduction in the current average annual allowable sale quantity (ASQ) of 102 million bd. ft. per year. I understand that there are proposals for reducing land suitable for timber production by 319,000 acres, a reduction of 22%, or almost one-quarter of the current timber-producing component of the forest. I am opposed to this reduction, especially removing acres to create old growth stands.

Before any new proposals are implemented, public input into your decision is necessary. I would ask you make your proposals known to the public and to obtain opinions from outside sources, before you implement any radical changes.

Best regards,

[IMAGE]

David Sater

68th District

W0735

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Jefferson City, MO 65101-8606
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Fax: 573-526-0891
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District Address:
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Cabool MO 65639

COMMITTEES:
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Professional Registration and Licensing
Fiscal Review

DON WELLS
State Representative
District 147

MAJORITY FLOOR WHIP

May 4, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
P. O. Box 22810
Salt Lake City UT 84122

Dear Team Members:

I represent House District 147, which includes Texas County and part of Pulaski and Phelps Counties, which include Mark Twain National Park. Please consider my concerns relating to the Revised Draft Plan for the Mark Twain National Forest.

I am concerned about and oppose any plan to reduce the number of acres that are suitable for timber production. I also oppose any plan that will reduce, overall, the amount of timber that can be grown on many acres.

I am concerned about and oppose the adoption of more mandated standards that will not allow for reasonable judgment in the application of management practices, especially timber sales. I am also concerned about any reduction in the amount of timber that can be harvested each year from USFS lands.

I also oppose burning several hundred thousand acres to accommodate restoration. I am concerned that such burning will cause damage to the Oak and Pine trees. I further oppose regeneration practices that do not favor Oak and Pine trees. I support more use of even-aged practices for the Oaks and Pines.

I oppose restrictive management activities for the protection of rare plant and wildlife species, such as the Indiana bat, when it is my understanding it is not know what has caused the decline of the bat.

I appreciate your consideration of the concerns expressed in this letter.

Sincerely,

Don Wells

Don Wells

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W0738

JIM WHORTON
State Representative
District 3
DISTRICT TELEPHONE
660-359-3988

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Committees
Appropriations- Agriculture and Natural Resources Committee
Agriculture Policy Committee
Budget Committee
Veterans Committee
Special Committee on General Laws

MISSOURI
HOUSE OF REPRESENTATIVES

May 4, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
P.O. Box 22810
Salt Lake City, UT 84122

Dear Content Analysis Team:

I am writing in regard to the proposed management plan for the Mark Twain National Forest located in southern Missouri. During my working years of 30 years as a forester, I had occasion to serve on two Districts of the Mark Twain and am somewhat familiar with the resources contained therein.

It is my opinion that current management goals should be extended into the future. I would support alternative number 5 over each of the other options. The forest is producing considerably more net growth than is being harvested. In order to maintain a healthy ecosystem, we should maintain and even increase existing harvest ratios. I believe that maintaining a proper growth and harvest pattern, will provide the proper infrastructure for the other components of the forest ecosystem; watershed, wildlife, herbs, floral and fauna, air quality and others including the ambiance that we enjoy as forest visitors.

I realize you are probably inundated with comments, so I won't continue to expand my opinions, but I would be happy to share additional thoughts if you so desire. Please feel free to contact me if you wish.

Sincerely,

Jim Whorton
State Representative, 3rd District

JW/PC

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MAY-3-2005 14:27 FROM: TO:88015171014 P:1/1

W0794

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PATRICIA M. YAEGER
State Representative
District 96

COMMITTEES
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Professional Registration and Licensing
Retirement
Senior Security

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May 4, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
P O Box 22810
Salt Lake City, UT 84122

Dear Sirs:

I am Representative Patricia M. Yaeger and represent the 96th District of the 93rd General Assembly (2005-2006) of the State of Missouri. I offer the following comments concerning the revised Draft Plan for the Mark Twain National Forest. Even though I don't represent a district with a lot of forested area; I feel strongly that we must manage our forests well for future generations. I am opposed t Alternative 1, 2, 3 and 4 and support Alternative 5, which would allow management of the Mark Twain Forest to be managed as mandated in the current 1986 plan.

Thank you for your attention to my comments.

Sincerely,

Patricia M. Yaeger

Representative Patricia M. Yaeger
District 96

PMY/nel

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W0743

DENT COUNTY COMMISSION
400 NORTH MAIN STREET
SALEM, MO 65560
573-729-3044

Content Analysis Team:
Mark Twain Forest Plan Revision
P.O. Box 22810
Salt Lake City, UT 84122

I would like to make the following comments concerning the Draft Revised Forest Plan for the Mark Twain National Forest.

I oppose all of the proposed Alternatives except Alternative 5. I support alternative 5, but with some reservations.

I oppose any reduction in the average annual allowable sales quantity from the current level of 105 million board feet per year.

I oppose the use of Ecosystem Management to restore thousands of acres to historical natural communities that over time will drastically reduce the amount of timber than can be harvested from the Mark Twain National Forest. I believe using historical information to manage the forest is bad science at best.

I oppose burning thousands of acres of forest land for restoration and other purposes. I believe such burning will have a drastic impact on our oak and pine forest conditions.

I oppose reducing acres suitable for timber production by 319,000 acres, especially for creating an additional 189,000 acres of old growth that will never be harvested. The plan provides for no process for the long-term management of old growth stands.

I oppose placing restrictions, especially regarding timber harvest or other forest use, for the protection of sensitive species such as the Indiana bat. The U.S.F.S. and other public agencies admit they do not know what has caused the decline in the bat population. Therefore, restrictions on timber harvesting are not based on good science (research).

I oppose the burning of thousands of acres for hazardous fuel reduction. I believe reasons for this particular burning is grossly overstated. I believe there will be more risk from escaped prescribed fire use or allowing such fires to naturally burn out, than from wild fire causes.

While I support Alternative 5, which would continue the current plan, I do so with the following reservations:

1. Many planned and promised management activities did not materialize in the 1986 plan (Alternative 5). We urge the U.S.F.S. to make every effort to address these shortfalls in Alternative 5.
2. Some standards, proposed for inclusion in the new plan have merit and should be included in Alternative 5.

Very Truly Yours,

J.J. Tune
Dist. #2 Commissioner

W0729

LARRY SPENCE
Presiding Commissioner

BILL LOVELACE
Northern Commissioner

MARK B. COLLINS
Southern Commissioner

HOWELL COUNTY
Forever Productive
Forever Beautiful
MISSOURI

4 Courthouse
West Plains, MO 65775

Meeting Days:
Mondays and Thursdays

Phone: 417-256-3872
FAX: 417-256-2512

HOWELL COUNTY COMMISSION

May 2, 2005

Mr. Ronnie Raum
Forest Supervisor
401 Fairgrounds Road
Rolla, MO 65401

COPY

Dear Mr. Raum:

First of all the Howell County Commission would like to express our appreciation to the U.S. Forest Service for the opportunity to comment on the 2005 Revised Forest Plan.

As a representative of the people who reside in this county, which contains 49,274 acres of U.S. Forest Service, we do have concerns over the proposals, especially alternative 3. The concept of burning several hundred thousand acres of timber to restore the ecosystem to what it is perceived to have been 10,000 years ago is incomprehensible. The act of destroying marketable timber is simply a bad idea. Besides the economic damage to Howell County, the definition of being good stewards of our natural resources would be seriously tested.

At a time when we are trying to improve our air quality, the health concerns of our citizens would be a great concern when the U.S. Forest Service is burning thousands of acres of timberland. Pre-settlement era was a time when the population of humans was nonexistent or very low, now the health and welfare of 38,238 people in Howell County, Missouri is our concern and this U.S. Forest Service plan is not in the best interest of the citizens we represent.

Please accept your responsibility of being good stewards of our nation's natural resources. Instead of alternative 3, we recommend alternative 5 for management practices.

This commission did not object when the U.S. Forest Service recently purchased over 1,000 acres in Howell County. But the proposed management of alternative 3 for the Mark Twain National Forest would change our minds and find the commission opposing instead of supporting the U.S. Forest Service.

Sincerely,

Larry Spence

Larry Spence, Presiding Commissioner

Mark B. Collins

Mark B. Collins, Southern Commissioner

Bill Lovelace

Bill Lovelace, Northern Commissioner

cc: Fred Fris
U.S. Representative Jo Ann Emerson
U.S. Senator Kit Bond
U.S. Senator Jim Talent

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W0733

LEO WARREN
Presiding Commissioner
JOHNNY D. WRENFROW
Associate Commissioner
BUDDY WRIGHT
Associate Commissioner

OFFICE OF
CLERK OF COUNTY COMMISSION
OREGON COUNTY
P.O. BOX 324
ALTON, MISSOURI 65606
417-778-7475
FAX 417-778-7488

GARY HENSLEY
Oregon County Clerk
JERI RACKLEY
Deputy
KIM HOLLIS
Deputy

April 25, 2005

To Whom It May Concern:

The Oregon County Commission fully concurs with the Missouri Forest products association's comments on the 2005 Draft Revised Forest Plan for The Mark Twain National Forest.
Just to reiterate on these comments.
(1.) We are concerned about any reduction in the amount of timber that can be harvested each year from USFS lands (ASQ). We oppose any reduction from 105 million bd. ft. per year.
(2.) The USFS is proposing to reduce the number of acres that are suitable for timber production by 319,000 acre. We are opposed to this proposed reduction since this reduction also impacts the ASQ.
(3.) We oppose the concept of Ecosystem Management and plans to restore conditions that may have existed back as far as 10,000 BC up to the late 18th Century, since this would reduce, overall, the amount of timber that could be grown on many acres.
(4) We are opposed to burning several hundred thousand acres to accommodate restoration. We believe such burning will cause considerable damage to our Oaks and, in some cases, Pines.
(5) We are opposed to restrictive management activities for the protection of rare plant and wildlife species, such as the Indiana bat, when USFS apparently does not know what has caused the decline of the bat.
(6) We oppose the adoption of more mandated standards that will not allow any reasonable judgment in the application of management practices, especially timber sales.
(7) We are opposed to regeneration practices that do not favor oak and pines. We recommend more use of even-aged practices for our oaks and pines.
(8) We feel that approving any or all of these subjects that we have commented on will greatly hinder our already stressed economy. Oregon County has over 105,000 acres of federal forest land and we would like to see this work for the good of our county rather than hinder it.

Sincerely Yours,
The Oregon County Commissioners

Leo Warren
Leo Warren: Presiding Commissioner, Oregon County

John Wrenfrow
John Wrenfrow: Southern Commissioner, Oregon County

Buddy Wright
Buddy Wright: Northern Commissioner, Oregon County

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MAY 11 2005

WD732

Texas County Commission

210 North Grand
Houston, Missouri 65483
417-967-3222

Joe B. Whetstine
Associate Commissioner
District One

Donald E. Shelhammer
Presiding Commissioner

Linda L. Garrett
Associate Commissioner
District Two

May 3, 2005

Content Analysis Team
Mark Twain Forest Plan Revision
P.O. Box 22810
Salt Lake City, UT 84122

To Whom It May Concern:

Upon review of the proposed revision of the Mark Twain National Forest Plan we strongly oppose the changes that were introduced. The changes will impose a severe economic impact throughout our county.

We believe the Forest Service is doing an outstanding job under the current plan and that alternative #5 is the most beneficial and judicial plan for Texas County.

We thank you for the opportunity to comment on the proposal.

Sincerely,

Donald E Shelhammer
Presiding Commissioner

Joe B. Whetstine
Associate Commissioner

Linda L. Garrett
Associate Commissioner

"Missouri's Largest County"

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MAY 11 2005

Appendix B

Analysis Process



Mark Twain
National Forest

Cover image: Nodding ladies' tresses orchid on igneous glade

Photographer: Paul Nelson, Mark Twain National Forest

Appendix B

Analysis Process

Introduction

This appendix provides additional detail on the process used in the analysis that went into modeling timber harvest schedules and economic analysis. Timber harvest schedules were used to develop the Plan's alternatives and determine allowable sale quantity by alternative. This information supplements the vegetation affected environment and effects analysis found in Chapter 3 of this document. The other area described in this section is methodology used in the economic analysis, which complements social and economic affected environment and effects analyses, also found in Chapter 3.

This discussion includes basic assumptions, modeling components and inputs, rules, methods, and constraints. Additional information and documents used in the analysis process are contained in planning records. The planning record, in its entirety, is incorporated here by reference. Results from the modeling process are estimates of what is expected if alternatives are implemented, which facilitates comparison of alternatives.

This analysis fulfills requirements codified in the Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 as amended by the National Forest Management Act (NFMA) of 1976. These Acts require that renewable resource programs are on a comprehensive assessment of present and anticipated uses. Demands for and supply of renewable resources must be determined through an analysis of environmental and economic impacts. This analysis was conducted in accordance with the planning regulations in effect before November 9, 2000 (See 36 CFR 219, revised as of July 1, 2000) as allowed under the 2005 planning regulations 36 CFR 219.14(e).

Timber Harvest Schedule Modeling

Scope of the Analysis

This environmental impact statement is being prepared in the context of revising the current Mark Twain National Forest Land and Resource Management Plan, approved in 1986. A significant part of the analysis effort in the 1986 Plan included modeling and evaluating various ways to allocate the land base to management prescriptions. The entire Forest was available for analysts and specialists at the time to evaluate different areas for their suitability and appropriateness to satisfy several possible multiple use objectives. This 'Zero based planning' process creates an initial Plan for an area that has never had a completed Plan. These uses included shortleaf pine emphasis (MP4.1), quality hardwood management (MP3.2) two categories of recreation emphasis (MPs 6.1 and 6.2), wildlife emphasis (MP 3.4) , natural vegetation emphasis (MP 3.1), grassland management (MP 3.3), cedar management (MP 4.2), Wilderness management (MP 5.1), Temporary Management (MP 6.3) and Special Area Designation (MP 8.1). Management prescriptions 71 (Developed Recreation Areas) and 3.5 Indiana Bat emphasis were later added to the plan by amendment.

The 2005 Plan changes management prescriptions of the Forest from specialty emphasis such as shortleaf pine emphasis (MP41), wildlife habitat emphasis (MP 3.4), etc. to ecosystem restoration (MP 1.1) and part of the semi-primitive motorized emphasis (MP 6.2) to

ecosystem restoration - semi primitive motorized (MP 1.2). The remaining areas are grouped into a general forest prescription (MP 2.1). Recreation emphases (MPs 6.1, 6.2 and 7.1), Wilderness (MP 5.1), Special Areas (MP 8.1) and Rivers (MP 6.3) have stayed the same or have added areas. Management Prescription 3.5 was dropped as a result of the new Ecosystem Restoration prescriptions and application of the MP 3.5 Standards and Guidelines to Forest-wide use.

While the new ecosystem management and general forest prescriptions merge many of the 1986 prescriptions, this is not a reallocation of the land base but a simplification of management prescriptions. This is not 'Zero based planning'. The scope of the analysis in this Plan revision effort focuses on outputs and conditions within various management areas while recognizing management emphasis changes presented in the alternatives.

The areas identified in the 1986 Forest Plan for timber management established a baseline for changes proposed in this revision effort. The most significant changes to lands that permit timber management resulted from better identification and mapping of special habitat conditions (i.e. old growth, caves, fens, etc).

Process Overview

Forest planning analysis problem is stated as follows:

- Given a fixed area of land, what activities should be allowed on each land unit over the next 150 years to achieve the desired future conditions and still meet all physical, operational and regulatory constraints?

To do this, Forest land area is divided into smaller homogeneous areas called analysis units. The planning horizon of 150 years is divided into fifteen 10-year periods. A computer program called SPRECTRUM analyzes forest-planning alternatives. SPRECTRUM is a decision support model, developed and supported by the USDA, Forest Service, which can simultaneously analyze trade offs between many goals, constraints, management activities, timing options and land types, which are necessary to manage a large forest. SPRECTRUM uses a linear program software program called C-Whiz, which in turn uses the Simplex method. Figure 1 provides a process flow diagram of the timber harvest schedule modeling process.

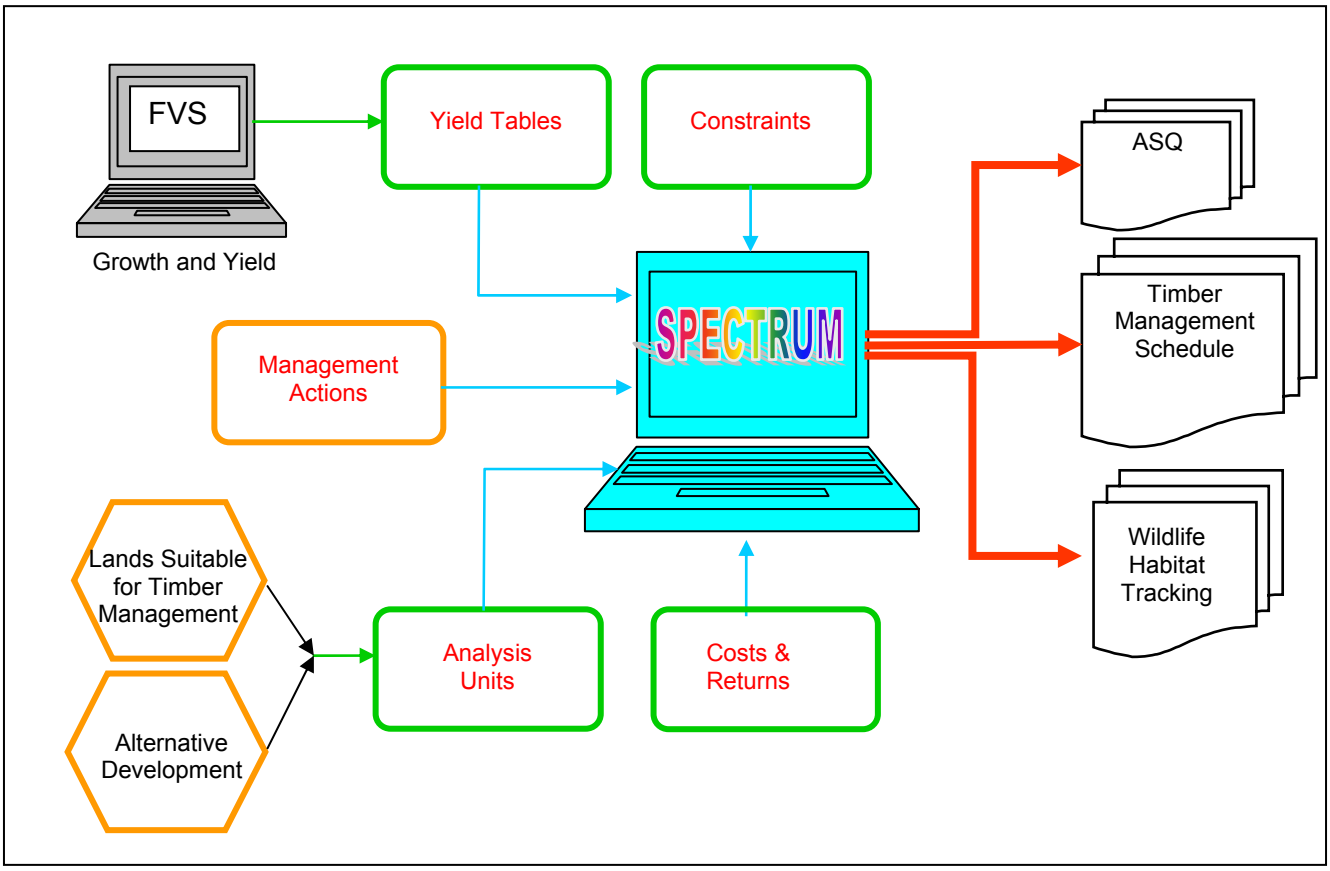
Prior to SPRECTRUM analysis considerable work was done to prepare data for input into the SPRECTRUM model. This work included the following:

- identification of lands tentatively suitable for timber harvest (per 36 CFR 219.14);
- analysis unit development;
- timber yield table development using the Forest Vegetation Simulator (FVS);
- economic information development;
- management prescription development; and
- determination of suitable acreage within each alternative.

The current and 2005 Forest Plan Standards and Guidelines (S&G) provides a framework for constraints, design of analysis units and development of possible timber management actions. Costs associated with various harvest activities and revenue from timber sales by product were additional inputs to the model. Outputs from the timber harvest schedule model included an allowable sale quantity (ASQ) for each alternative, timber management schedules to achieve each ASQ, and some indicators to track specific types of wildlife habitat. The

analysis uses acreage figures derived from Geographic Information System (GIS) data, which is + or – 2% difference from official land status acres.

Figure 1 - Timber Harvest Schedule Model - Process Overview



Common Assumptions Used

The model(s) were "built" based on several Assumptions:

- The Forest Land Management Plan (Plan) will be a strategic Plan that will guide broad land-based decisions to implement certain Goals and Objectives.
- "On-the-ground" decisions will utilize standards and guidelines of the Plan and implementation guides to meet goals and objectives of the strategic Forest Plan.
- Models used in this analysis are sufficient for strategic planning.
- Each alternative would use the same standards and guidelines and that only the area of land allocated to a Management Prescription would vary. Each alternative uses the same suitable timberlands for the Timber Harvest Scheduling analysis.
- As a rule, the ID Team would accept an "error" rate of plus (+) or minus (-) ten percent (10%) within any division of National Forest land, for any Activity, Output or Condition. Acre summaries will not always match and may be as large as 2 or 3 thousand acres. This is due to GIS analysis on large, detailed datasets and 'rounding off' methods used by different computer programs.
- Any policy guidance provided by the Region would be timely and pertinent.

Timber Suitability Analysis

Five standards determine whether a particular land area might be suitable for timber production (entire process is detailed in FSH 2409.13):

- Is the land forested? (36 CFR 219.9(a)(1))
- Is the land withdrawn from timber production? (36 CFR 219.14(a)(4))
- Is irreversible resource damage likely to occur? (36 CFR 219.14 (a)(2))
- Is there reasonable assurance that the technology and knowledge exists to adequately restock lands within 5 years after final harvest? (36 CFR 219.27(c)(3) and FSH 2409.13, 21.42)
- Is the land capable of producing industrial wood? (FSH 2409.13-21.3))

Those lands that remain after applying the five standards are termed tentatively suitable (Stage 1) timberlands, as shown in Table 1. Table 1 compares the timber suitability analysis from the Mark Twain Forest Plan of 1986 to the analysis for the 2005 Forest Plan.

In a 1995 analysis of land suitability, the Forest removed steep slopes, designated old growth, candidate areas, riparian areas and a reduction of acres in Management Prescription 6.3, 8.1 and 9.1. This reduced the suitable land base to 945,800 acres.

Table 1 - Draft Summary of Lands Suited for Timber Production

Classification	1986 Forest Plan [1]	Revision (2004 Analysis Acres)
Net National Forest System Land	1,461,600	1,495,747
Water	-3,500	-2,814
Non-Forest Land (Open Lands, Road and Utility Rights-of-Ways, glades, etc.) [2]	-23,200	-104,447
Sub-Total Non-Forest Lands	26,700	107,261
Forest Land	1,434,900	1,388,485
Not Available – Wilderness	-64,200	-57,015
Not Available --list any other areas withdrawn by Congress, the Sec., or the Chief ... (Eleven Point NS River, Greer Special Area, Irish Excluded Lands)	-0	-12,966
Not Capable of Producing Industrial Wood	-0	0
Potential for Irreversible Soil/Watershed Damage	-0	-0
Restocking in Five Years not Assured	-0	-0
Inadequate Response Information	-34,700	-1,964
Sub-Total Forest Land Withdrawn	98,900	71,945
Sub-Total Non Forest and Forest Land Withdrawn	125,600	179,206
Tentatively Suitable Lands (Stage1)	1,336,000	1,316,541
Not Suitable due to Minimum Management Requirements, and for other Resources. (i.e., riparian areas, Experimental Forest, habitat for Threatened, Endangered, or Sensitive Species, administrative and developed recreation sites, designated old growth, etc.) [3]	-53,500	-319,829
Lands Suitable and Appropriate for Timber Production (Stage2)	1,282,500	996,712

1 Data from the 1986 Forest Plan Table 4-2, IV6

2 Current open lands now include 44,000 acres of open and semi-open Glades.

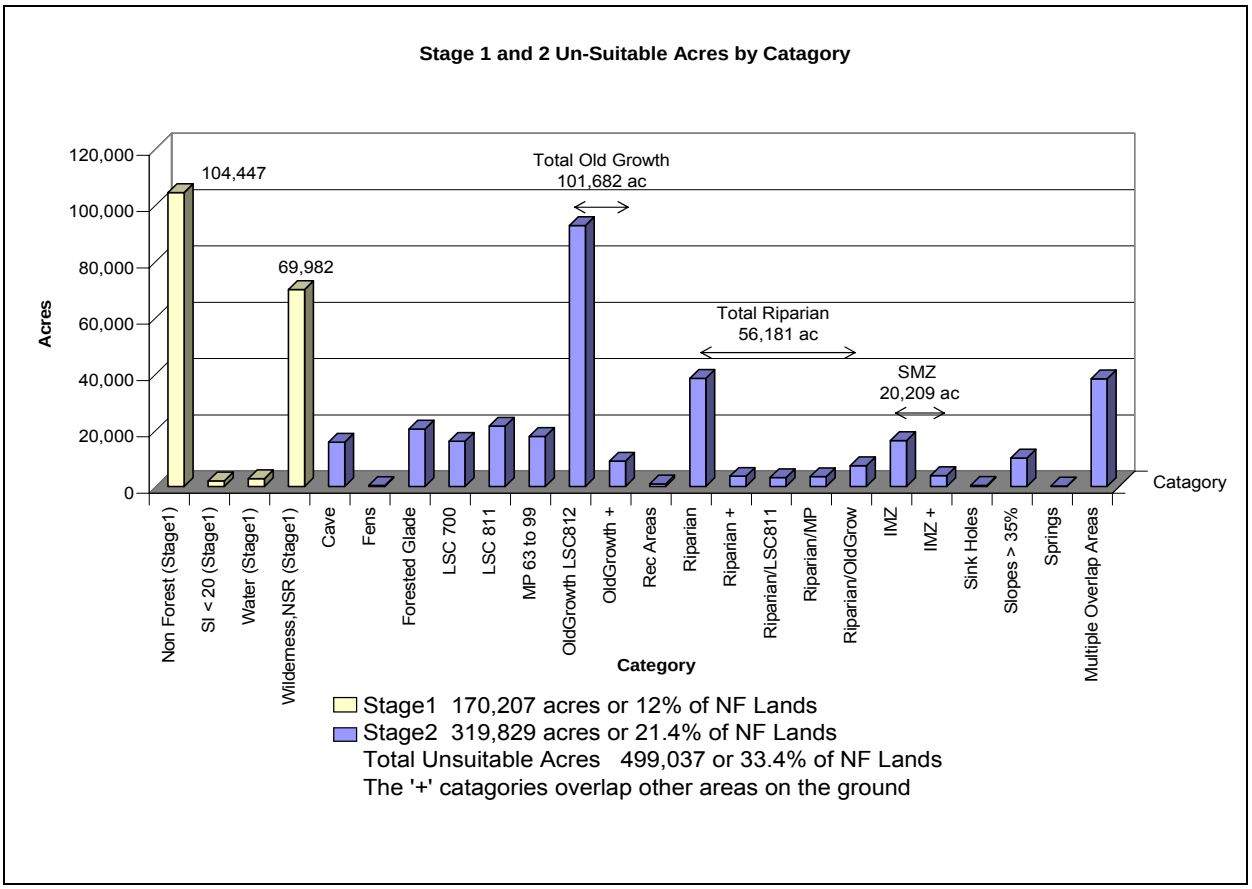
3 The 1986 Plan did not remove old growth areas from the suitable base.

4 Acres from this table in the FEIS have been rounded and will not match; some acres of Wilderness are withdrawn as open land.

Timber suitability is further refined (Stage 2) by removing lands that are not suitable due to minimum management requirements or for other resource needs. Examples are riparian areas, experimental forest, habitat for threatened, endangered, or sensitive species, administrative and developed recreation sites or designated old growth. Most of these lands are in the plan as a Specialized Habitat, Special Areas (MP 8.1) or as a Standard or Guideline (S&Gs). See Figures 2.

Geographic Information System (GIS) data layers reflect each of the management requirements, resource need, or S&G.

Figure 2 - Stage 1 and 2 Non-Suitable Lands for Mark Twain National Forest



Analysis Units

Land stratification is the process of splitting up suitable timber lands into units that respond similarly to management actions and have similar management requirements. Stratifications of suitable timber lands in SPRECTRUM are called levels. Each unique combination of selected attributes is referred to as a strata or analysis unit. The Forest Geographic Information System (GIS) was used to delineate analysis areas according to 4 attributes.

The term “Management Prescription” (MP) assigns management scenarios and S&Gs specific to that prescription.

Table 2 – Analysis Unit Level 1, Management Prescription

Class	Attribute Name
Ecosystem Restoration Emphasis	1.1
Ecosystem Restoration Semi-Primitive Motorized Emphasis	1.2
Ecosystem Enhancement Emphasis	2.1
1986 Plan = Natural Vegetation Communities Emphasis	3.1
1986 Plan = High Quality Hardwoods Emphasis	3.2
1986 Plan = Grassland Management Emphasis	3.3
1986 Plan = Wildlife Diversity Emphasis	3.4
1986 Plan = Indiana Bat Areas of Influence (AOI)	3.5
1986 Plan = Shortleaf Pine Emphasis	4.1
Semi Primitive Non-Motorized Recreation Emphasis	6.1
Semi Primitive Motorized Recreation Emphasis	6.2

Site index grouping assigns or limits management activities based on site productivity and or cost/investments.

Table 3 - Analysis Unit Level 2, Site Index Group

Class	Attribute Name
21-54 site index	Low
55 + site index	Med

Forest type grouping represents main forest types found on the Forest. These groups have distinct rotation ages and specific management activities associated with them.

Table 4 - Analysis Unit Level 3, Forest Type Working Group

Class	Attribute Name	CDS Forest Type Codes
Pine	Pine	3,32,33
Oak/Pine	OKPine	44
White/Post Oaks	WPOak	51,54
Red/Black Oaks	RBOak	53,55,56,57,58,59

Age class structure is derived from stand age. The Forest has management problems directly related to age and structure. Figure 3 shows the current Age Class distribution and B-4 shows the structure distribution for the Forest as a whole and lands suitable for timber management.

Table 5 - Analysis Unit Level 4, Age Class Structure Group

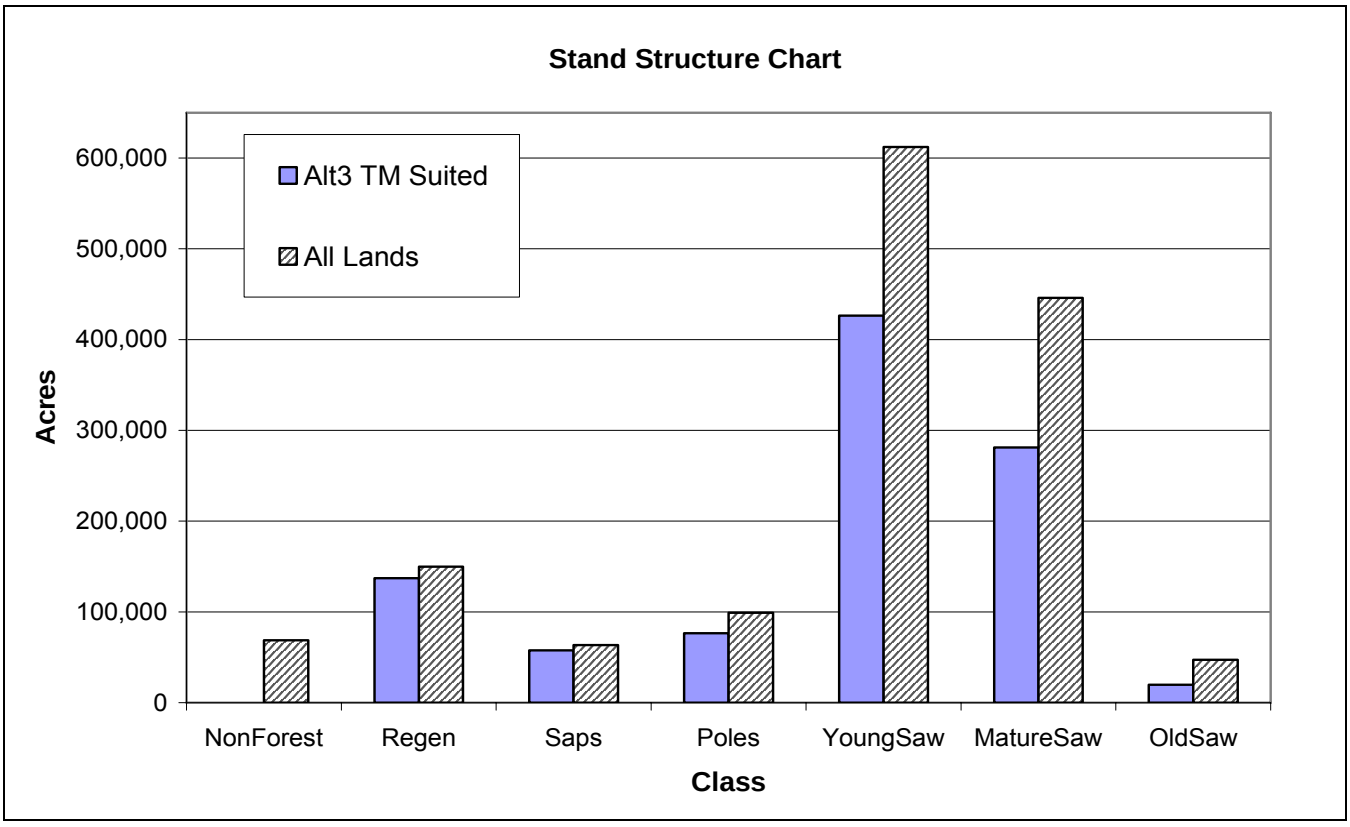
R9-CDS Age Class[1]	Attribute Name	SPRECTRUM Beginning Age
1	Regeneration	1
2	Saplings	2
3 or 4	Poles	4
5,6,7	Young Sawtimber	6
8,9,10,11	Mature Sawtimber	9
12,13,14,15,16	Old Sawtimber	12

1 CDS- Combined Data Systems database

Figure 3 - Current Age Class Distribution for Mark Twain National Forest



Figure 4 - Current Stand Structure Distribution for Mark Twain National Forest



Growth and Yield

Timber yields were developed using the Forest Vegetation Simulator (FVS), an individual-tree, distance-independent growth and yield model. Forest Inventory and Analysis (FIA) date from the Mark Twain National Forest and Missouri was pre-processed using the Pre-suppose program to meet analysis criteria, then processed with FVS to produce yields using several different scenarios or prescriptions. Tree data from the Region 9, Combined Data System (R9-CDS) was also summarized and used. Samples of yield tables were compared to yield from actual sales from the last 10 years to determine if the model was providing reasonable information. After formatting, yield tables representing Gross Volume were input into the SPRECTRUM model.

Plot data analyzed for non-commercial species and defect indicators helped create multipliers to adjust gross volumes. Wildlife reserve tree Guidelines could not be accounted for in a spatial context, so an additional 10% adjustment was made to all regeneration activities. Reductions to gross volumes were made to each species group by treatment type, using multipliers shown in Table 6.

Table 6 - Gross Volume Multipliers

Act/Output	Treatment Type[1]	Factor
Hardwood Pulp	All CC	0.75
Hardwood Pulp	All UEAM	0.70
Hardwood Pulp	- - - -	0.85
Hardwood Saw	All CC	0.73
Hardwood Saw	All UEAM	0.70
Hardwood Saw	- - - -	0.83
Pine Pulp	All CC	0.83
Pine Pulp	All UEAM	0.70
Pine Pulp	- - - -	0.93
Pine Saw	All CC	0.82
Pine Saw	All UEAM	0.70
Pine Saw	- - - -	0.92

1 CC- Clearcut, UEAM- Uneven aged management

Timber Harvest Schedule Modeling

The timber harvest scheduling analysis seeks to provide an optimum solution for how and when to harvest wood consistent with regulatory and user-defined constraints. In order to evaluate all possible management techniques, while seeking an optimal solution, the Forest employed computer-based modeling software. SPRECTRUM 2.6 is a software package developed by the Forest Service's Ecosystem Management staff in cooperation with the Rocky Mountain Forest and Range Experiment Station. The model optimizes management area prescriptions and allocations, and schedules activities and outputs. SPRECTRUM chooses among alternative solutions based on a set of constraints and an objective such as maximizing income or timber volume.

Regulations to implement the National Forest Management Act (NFMA) require that Forest Plans contain constraints on the timber flow over time and the forest structure at the end of

the planning horizon. The SPRECTRUM model contains special constraints to deal with timber flow, long-term sustained yield, and final forest structure.

The NFMA harvest policy constraints are:

- Non-declining Yield (NDY) - prevents the ASQ from decreasing period to period.
- Long-Term Sustained Yield Capacity (LTSYC) - controls the amount of estimated long-term sustained yield (LTSY).
- ASQ-LTSYC Link - controls the relationship between the ASQ and the LTSYC. Normally ASQ is Less than or equal to LTSY.
- Perpetual Timber Harvest – this ensures that the inventory in the last period is greater than or equal to the average inventory during the planning horizon.

A more detailed discussion on calculation of harvest policy constraints is in the SPRECTRUM documentation.

The Forest used SPRECTRUM as a timber harvest-scheduling tool that reports timber outputs, costs, and benefits. The model scheduled timber harvesting for 15 decades and provided an estimate of long-term sustained yield (LTSY) capacity for each of the alternatives.

SPRECTRUM is a linear programming model. It assumes that the relationship between outputs and the land base are linear, e.g., twice the number of similar acres yields twice the outputs. Other resource programs such as recreation are beyond SPRECTRUM capabilities because their relationship with the land base is not clearly defined in mathematical yield functions available at this time. SPRECTRUM builds a matrix of coefficients and transfers the file to a linear programming package for problem solution. The model then writes a report and produces a data file that contains results. Comparisons with information in other databases can help analyze the data files.

Model Assumptions

Assumptions made for modeling timber management area prescriptions, allocations, outputs, and scheduling activities are listed as follows:

- Only lands suitable for timber management are modeled. All S&Gs and Plan requirements that can be spatially modeled in GIS are met by removing the Stage 2 lands from the suitable timber base. The model only addresses timber scheduling and NFMA requirements. The model does not address other resource issues.
- Forest-wide and resource specific standards and guidelines are used for all even-aged and uneven-aged prescriptions.
- Modeling for forest type conversions and future oak decline is not included. Oak decline is not modeled specifically, but oak decline was active on the tree plot data used to build the yield tables, so it was implicitly modeled.
- The Combined Data System’s stand exam data is sufficiently accurate to use in determining average input stands used in modeling.
- Reserve tree guidelines are satisfied within the model with a 10 % reduction of volume for all regeneration harvest prescriptions.
- Regeneration, no action, and UEAM treatment options are available for all stands past rotation age.

- ASQ will not decrease between successive decades. All NFMA requirements are met by the models use of Non-Declining Yield (NDY), Long Term Sustained Yield (LTSY), Perpetual Harvest and ASQ<=LTSYC Link constraints.
- After lands are entered with a particular management strategy (uneven- vs. even-aged) and intensity (frequency of entry to harvest), strategy and intensity will continue indefinitely on those lands without interruption.
- Application of the SPRECTRUM model on this Forest has a very limited spatial component, which does not consider adjacency and sale layout considerations.
- Treatment schedules are constructed to allow for one or two decade extensions from optimally-designed treatment strategy in order to provide a set of modeling options consistent with maintaining non-declining yield. Alternative 1 is a timber schedule model that only cuts the timber but does not sell or remove the timber

Constraints

The major constraints used in the model for Alternatives 1 are:

- Total Harvest per decade in MP 61 must be <= 10 % of the MP 61 land area.
- Total Harvest per decade in MP 62 must be <= 20 % of the MP 62 land area.
- Total regeneration harvest per decade in MP 61 must be < 3 %
- Total regeneration harvest per decade in MP 62 must be < 5 %
- No thinning is allowed in MP 61 or mp 62 areas

The major constraints used in the model for Alternatives 2-4 are:

- Total Harvest per decade in MP 61 must be <= 10 % of the MP 61 land area.
- Total Harvest per decade in MP 62 must be <= 20 % of the MP 62 land area.
- Total regeneration harvest per decade in MP 21 must be >= 11 % and <= 16 %
- Total regeneration harvest per decade in MP 61 must be >= 3 % and <= 5 %
- Total regeneration harvest per decade in MP 62 must be >= 5 % and <= 10 %
- Total regeneration harvest per decade in MP 21 must be >= 11 % and <= 16 %
- Total regeneration harvest per decade in MP 21 must be >= 11 % and <= 16 %

The major constraints used in the model for Alternative 5 are:

- Total regeneration harvest per decade in MP 31 must be >= 7 % and <= 15 %
- Total regeneration harvest per decade in MP 32 must be >= 8 % and <= 15 %
- Total regeneration harvest per decade in MP 33 must be >= 3 % and <= 8 %
- Total regeneration harvest per decade in MP 34 must be >= 8 % and <= 15 %
- Total regeneration harvest per decade in MP 35 must be < 7 %
- Total regeneration harvest per decade in MP 41 must be >= 8 % and <= 15 %
- Total Harvest per decade in MP 61 must be <= 10 % of the MP 61 land area.
- Total Harvest per decade in MP 62 must be <= 20 % of the MP 62 land area.
- Total regeneration harvest per decade in MP 61 must be >= 3 % and <= 5 %
- Total regeneration harvest per decade in MP 62 must be >= 5 % and <= 10 %

An estimated budget constraint showed affects on the overall timber program given different levels of program costs. Each alternative ran without budget constraints. Then total dollars are constrained to $ 6.0 Million (MM), 5.5 MM, 5.0 MM, 4.2 MM (FY 2004 budget), 4.0 MM, 3.8 MM and 3.5 MM.

Program Costs and Stumpage Revenues

Stumpage prices (Table 7) for sawtimber came from the October-December 2003 Timber Harvest report from the Missouri Department of Conservation. Pulp prices we averaged for the 2nd quarter sale on National Forest Lands. Other costs use current FY 2004 prices.

Table 7 - SPECTRUM Revenues per MCF

Product	Revenue per MCF[1]
Hardwood Pulp	80.00
Hardwood Sawtimber	900.00
Pine Pulp	50.00
Pine Sawtimber	780.00

1 Thousand Cubic feet

Table 8 - SPECTRUM Costs per MCF

Work	Cost per MCF
Temporary Roads	
UEAM	4.00
Ecosystem Management	2.50
Timber Medium Level	1.75
Timber Minimum Level	1.00
No Harvest	0.50
System Road Work	18.93
Timber Sale Costs (NEPA to Close)	
UEAM	445.00
EAM Regeneration	270.00
EAM Thinning	392.00

Table 9 – SPECTRUM Costs per Acre

Work	Cost per Acre
Regeneration Work	80.00
Non-Commercial Tree Felling	595.00

Future costs and revenues are discounted at a rate of 4% per year to convert future values to present day dollars. Tables B7 and B8 show the current costs associated with conducting timber sales on the Forest, less overhead and cost pools.

Benchmarks

Benchmark analysis is specified in the NFMA regulations in 36 CFR 219.12(e) as part of the Analysis of the Management Situation. Selection of which benchmarks to develop is dependent upon revision topics. Benchmarks estimate the Forest's physical, biological, and technical capabilities to produce goods and services and assist in defining the range within which alternatives can be constructed. Benchmarks do not constitute alternatives because alternatives are designed to consider integrated management of all resources.

Seven benchmarks are relevant to the timber revision topic. They are:

1. Maximizing present net value of the timber program – no harvest constraints
2. Maximizing timber production in the first decade – no harvest constraints

3. Maximizing present net value of the timber program – with Non-Declining Yield harvest constraint
4. Maximizing timber production in the first decade – with Non-Declining Yield (NDY) harvest constraint
5. Maximizing present net value of the timber program – with NDY and LTSY harvest constraints
6. Maximizing timber production in the first decade – with NDY and LTSY harvest constraints
7. Minimizing costs of the timber program

Tentatively suited land base had benchmark scenarios applied to show the "maximum biological capability" of the Forest's timber resource. Suited timber base of 996,710 acres had the same scenarios applied. Comparisons, shown in Figure 5, show differences or "trade offs" of implementing constraints to meet minimum regulatory requirements as set in Forest Service direction. These constraints are coarse assumptions applied to maintain habitat for some Threatened, Endangered and Sensitive (TES) species, clean water requirements, etc.

Analysis on tentatively suited lands shows the effect of implementing the NFMA constraint of Non-Declining Yields. It creates a drop of 379 MMBF or 66 % reduction in the first decade outputs. Analysis shows that the Max PNV and ASQ may be possible, though not sustainable. What occurs is a massive "cut off" in the first 2 decades and then no harvesting for several decades. This is due in part to the Forest's age class distribution (Figure 3) and to economic considerations. The effect of adding the Long Term Sustained Yield constraint creates a further reduction of 13 MMBF or 7 %, but resulting yields for each decade are very similar to the first decade. Eliminating these large swings in decade outputs is the main reason for the required NFMA constraints.

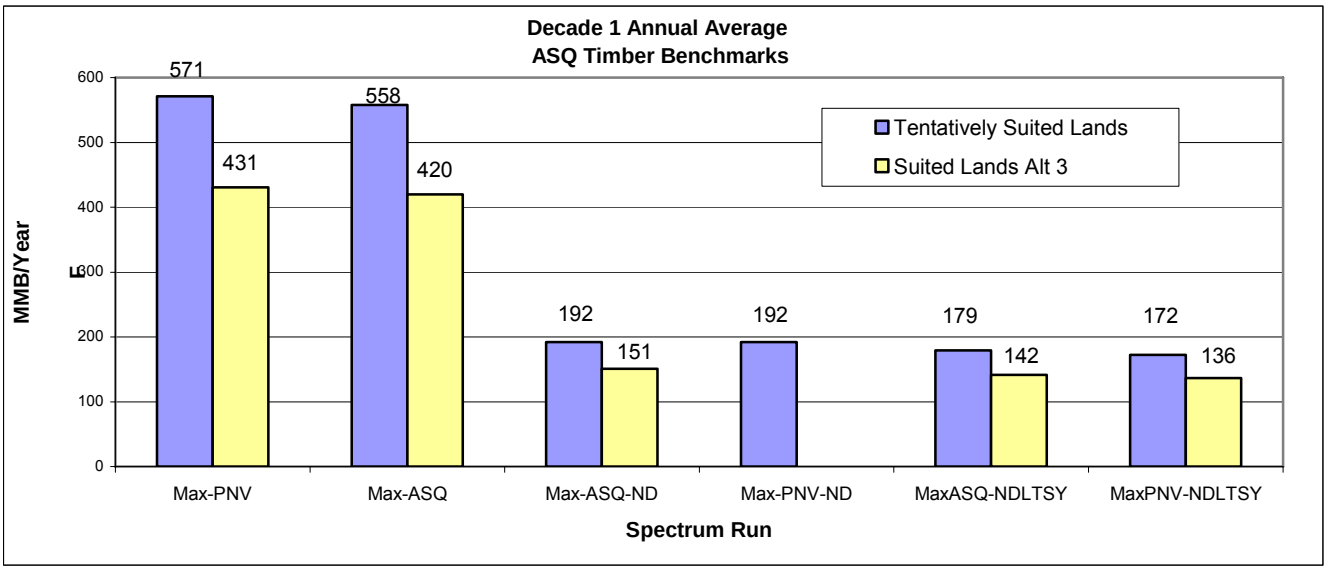
Analysis of the suited timber base show similar results as for the tentatively suited base. When applying the NFMA constraints, outputs for MaxASQ-NDLTSY are reduced 37 MMBF or 21 %

Maximizing the Present Net Value (PNV) produces negative numbers in all but one case – MaxASQ-ND.

The minimum level benchmark for timber would show no commercial timber production or an ASQ of zero. The PNV for timber is zero, since there would be no costs incurred (for timber) and no revenues generated.

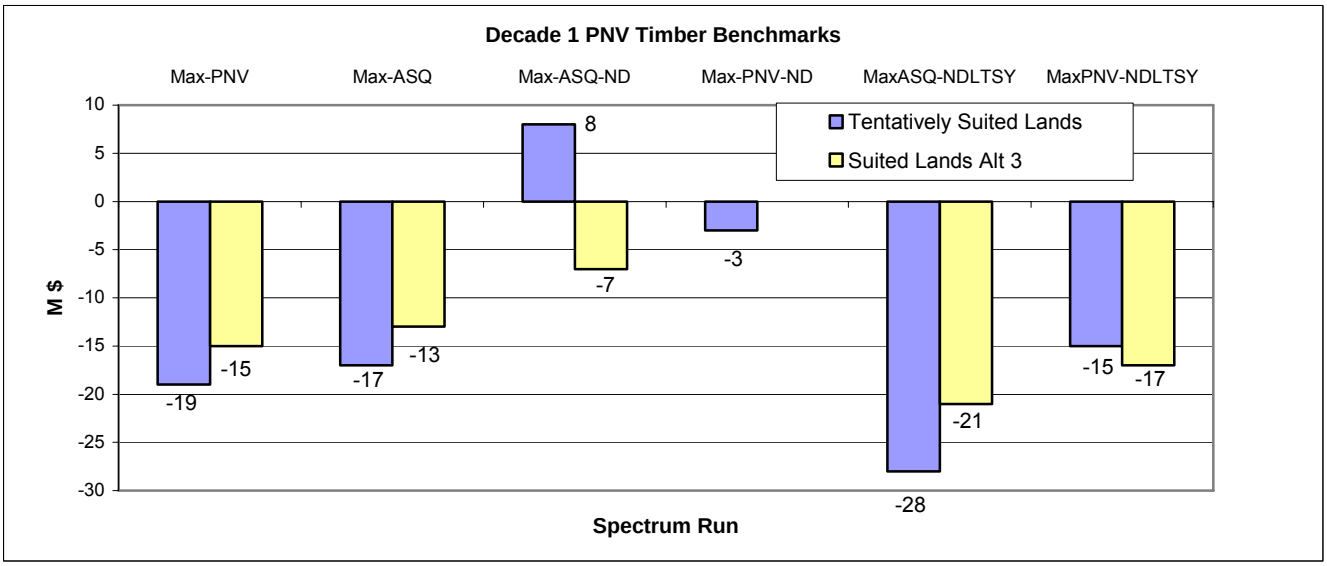
Figures 5, 6, 7 show allowable sale quantity (ASQ), present net value (PNV) and long-term sustained yield (LTSY) of all benchmarks. All PNV calculations share a common annual discount rate of 4% per year (Row, C. et al., 1981).

Figure 5 - First Decade Benchmark Comparison, Annual Average Allowable Sale Quantity



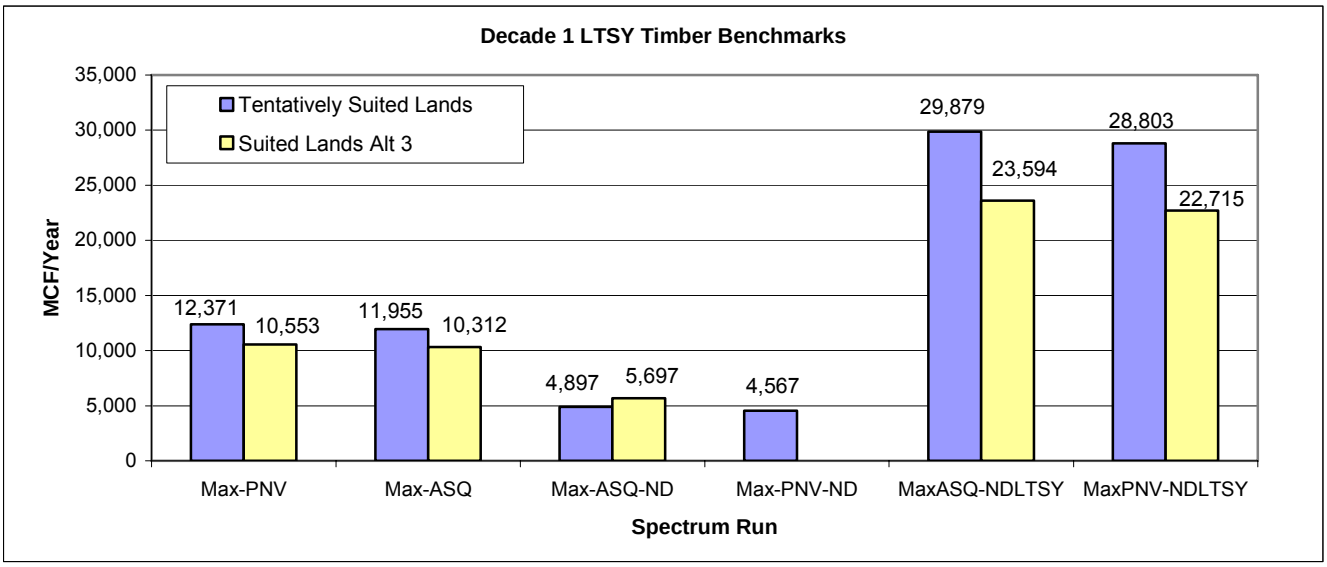
PNV = Present Net Value; ASQ = Allowable Sale Quantity; ND = Non-Declining Yield; LTSY = Long Term Sustained Yield

Figure 6 - First Decade Benchmark Comparison, Present Net Value



PNV = Present Net Value; ASQ = Allowable Sale Quantity; ND = Non-Declining Yield; LTSY = Long Term Sustained Yield

Figure 7 - First Decade Benchmark Comparison, Long Term Sustained Yield



PNV = Present Net Value; ASQ = Allowable Sale Quantity; ND = Non-Declining Yield; LTSY = Long Term Sustained Yield

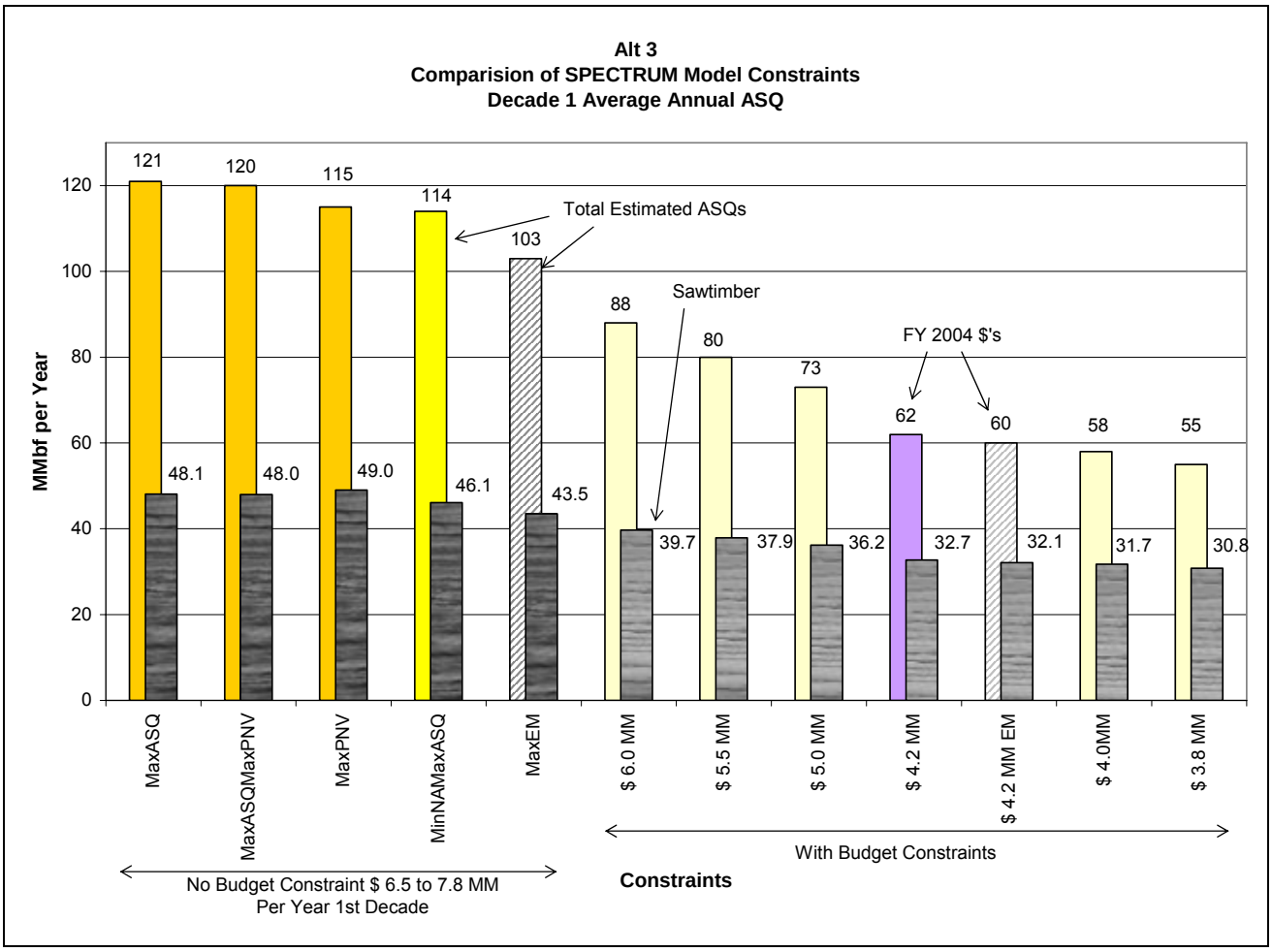
Results of Alternative Modeling

Five of the benchmark scenarios were used to model Alternatives 2 through 5 as a check of both the model and benchmark assumptions. Results and trends were similar to the first benchmark runs. Next, all Plan constraints were applied to the models and five scenarios run. Scenario 5 is the most representative of the intent of the 2005 Forest Plan; ASQ is set from this.

1. Max ASQ = Maximize Allowable Sale Quantity
2. Max ASQ Rollover to Max PVN = Maximize ASQ then use as a constraint to Maximize PNV
3. Max PNV = Maximize Present Net Value
4. MinNA Rollover to Max ASQ = Minimize No Action then use as a constraint to Maximize ASQ
5. Max EM = Maximize Ecosystem Management work

Seven budget constraining scenarios were run to test the effect or limits of budget, which compares to a current budget of $ 4.2 million dollars for Fiscal Year 2004. Figure 8 shows results for Alternative 3. The chart compares the total ASQ verses the sawtimber portion of the ASQ for each of the model runs. Results and trends for the other alternatives are very similar to Alternative 3.

Figure 8 - Comparison of Effects of SPECTRUM Modeling Constraints on Average Annual ASQ



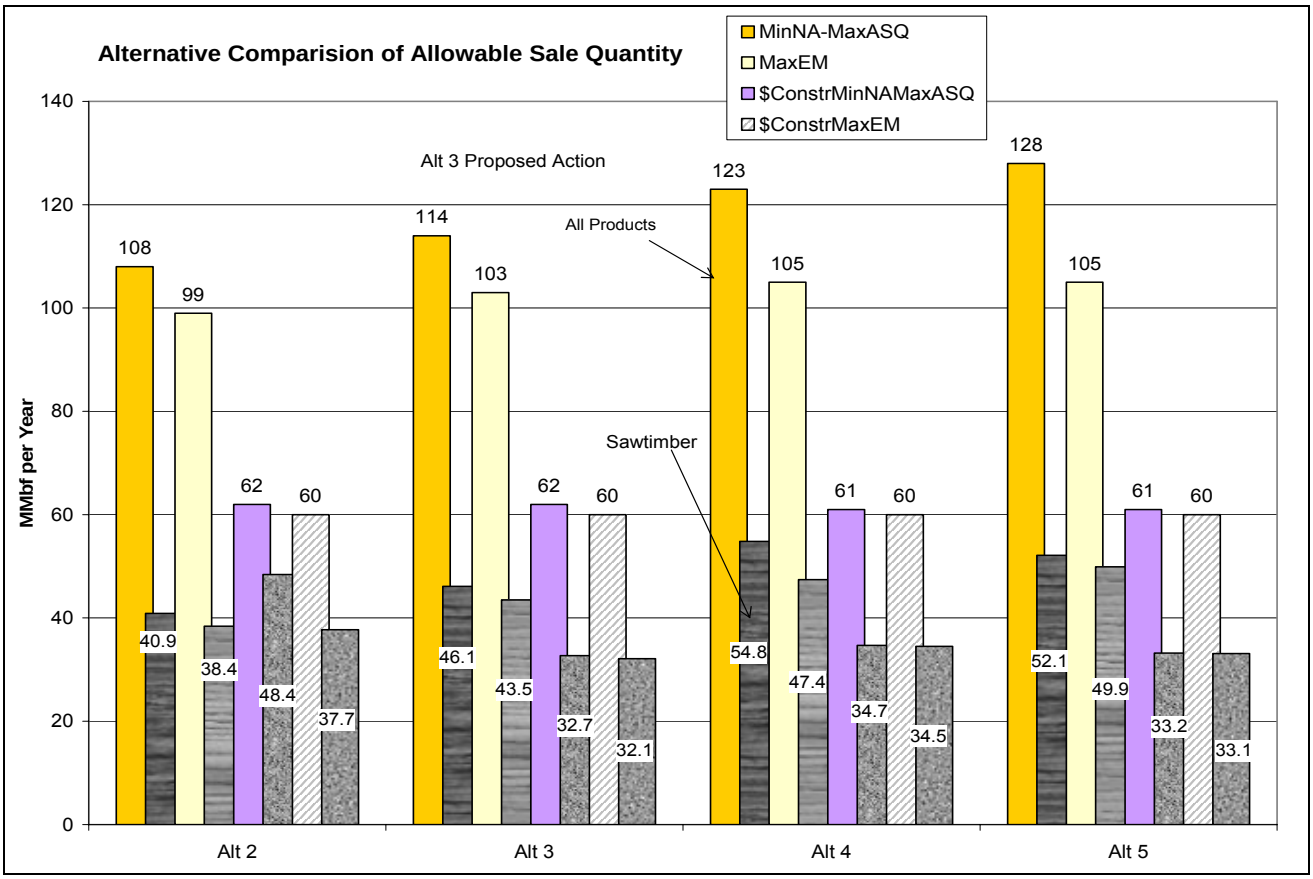
Analysis Results (See Table 10 and Figure 9):

- Alternative 1 is shown only for a comparison of what would be cut and left in the woods and the costs of implementation.
- Sawtimber volume in each alternative is less than 50 % of the ASQ
- Minimize No Action-Max ASQ costs $400, 000 to $750,000 over the cost of Max Ecosystem Management scenario in Alternatives 2-5.
- As budgets increase, ASQ increases, but the volume increase is 80% pulp, and program efficiency/ PNV goes down.
- The most cost efficient scenarios also have the most “No Action” acres selected.
- All alternatives become un-solvable when the budget drops below $ 3.0 Million/year.
- Under a constrained budget similar to FY2004, Alternatives 2-5 are virtually equal in ASQ; less than 6 MMBF difference.
- Alternative 4 has the “most efficient” timber program based on a timber program PNV analysis.
- Alternative 1 is the “most inefficient” as it pays to cut timber and leave it in the woods and does not show any revenue.

Table 10 – SPECTRUM Analysis Results

Alt 1 Volume Cut and Left	Budget Assumptions	Alt 2	Alt 3	Alt 4	Alt 5
	Unconstrained Budget				
24 MMBF	ASQ –Total (MMBF/Year)	99	103	105	105
	Sawtimber (MMBF/Year)	38.4	43.5	47.4	49.9
	Sawtimber % of ASQ	39%	42%	45%	48%
17 to 18	Budget Needs (MM$ Dollars/Year)	6.3 to 7.3	6.5 to 7.8	6.6 to 8.0	6.5 to 8.3
	Constrained Budget of $ 4.2 MM				
	ASQ Total (MMBF/Year)	62	62	61	61
	Sawtimber (MMBF/Year)	48.4	32.7	34.7	33.2
	Sawtimber % of ASQ	78 %	52%	56%	54%
	Timber PNV Range				
	Unconstrained Budget (M $/Decade)	0 to 1	0 to 2	0 to 2	-4 to 4
	Constrained Budget (M $/Decade)	0 to 3	5	6	5

Figure 9 - Alternative Comparisons



Social and Economic Resiliency Analysis

The purpose of this portion of Appendix B is to provide interested readers with additional details regarding the social and economic analyses of alternatives for management in the 2005 Forest Plan. This section will not provide sufficient information to replicate the analysis. For that level of detail, consult specialist reports contained in the administrative record-.

Economic sustainability was a significant issue in the Forest Plan revision and economic analysis is required to make informed decisions. Data used to display economic effects throughout the FEIS process were considered reliable or adjusted based on updates to data sources considered to be the most reliable at the time this analysis was completed.

36 CFR 219.12(g)(1) requires an analysis of expected outputs during the planning period. It suggests use of outputs, which include marketable goods and services as well as non-market items, such as recreation, and wilderness use, wildlife and fish, protection and enhancement of soil, water, and air, and preservation of aesthetic and heritage resource values. Based on these resources, the EIS set out to show a present net value (PNV) as required by 36 CFR 219.

A large number of rules and regulations designed to lessen negative impacts or otherwise protect resources govern Forest Service activities. In the planning process, benefits associated with regulations are seldom put in terms of dollars. The costs of achieving these benefits are increased operating costs and could result in reduced revenues.

The Forest has discussed only the foreseen environmental consequences of the proposed land management alternatives in the Final EIS. For resources that can be reasonably valued via market data (e.g. timber, minerals), and for those non-market resources that have estimated values based on Forest Service research, we have presented a present net value calculation. Resources that have no values such as wilderness use or heritage resources the value was estimated by generally accepted methods, and are discussed in assessing net public benefits.

During the revision process we specified dollar values of all market and non-market benefits in an accepted manner, as well as direct cost and revenues that could occur under a specific alternative. This was done to provide as much comparative information as possible to aid in making an informed decision among the alternatives.

Many “ecosystem services “ provided by forested land, such as flood control, purification of water, recycling of nutrients and wastes, production of soils, carbon sequestering, pollination, and natural control of pests are not given monetary values. Use of option values and existence values are not items suggested to be discussed under 36 CFR 219. These are highly controversial methodologies, which can be of a contentious nature with many publics. The Forest Service has chosen not to use values based on questionable and controversial methodologies and values not specifically required by agency directives. Externalized costs of resource extraction, such as increased rates of death, injury and property damage resulting from accidents involving heavy equipment, log trucks, ATVs and other dangers related to intensive resource use and development, are effects remote from resource management on the forest. Their unforeseen nature does not warrant a consideration in the efficiency analysis by 36 CFR 219.

The Forest Service does not use its social and economic analysis’ quantified measures and indexes as the only way of showing alternative impacts (FSM 1970.8(5)). These numbers are only one piece of information for the decision maker to use in making a selection among alternatives. Other resources biological or physical that are impacted are compared in a qualitative manner by comparing the environmental effects of each alternative. These effects

of forest land management are discussed along with financial outputs in arriving at an alternative that maximizes net public benefits. After comparing the effects of all alternatives and comments from public participation, a determination of the alternative which best maximizes public net benefits, is left to the judgment of the decision maker.

Forest Economic Impact Area

Due to the complex economic interactions between individuals, firms, and governments, no impact area can accurately represent the economic impact. An impact area includes a set of decisions that offer the best answers to questions that publics, decision-makers, and economists ask. Relevant questions for describing impact areas for forest planning include considerations for functional economies, state and local planning regions , Forest Service expenditures, and other factors.

Impact areas are defined using historic and anticipated effects of National Forest management in Missouri. However, there is no guarantee that they will provide the best fit for assessing future effects. Effects of future National Forest management should be monitored to see whether the criteria for impact area definition and their application are providing reliable and useful estimates of local economic impacts.

For recreation, timber and other impacts associated with Forest activities, we used the same 29-county impact area as was used for the 1986 Forest Plan. The counties are Barry, Bollinger, Butler, Carter, Christian, Crawford, Dent, Douglas, Howell, Iron, Laclede, Madison, Oregon, Ozark, Phelps, Pulaski, Reynolds, Ripley, Saint Francois, Sainte Genevieve, Shannon, Stone, Taney, Texas, Washington, Wayne, and Wright.

Even though the two counties that make up the Cedar Creek unit are not contiguous to the rest of the Forest, a decision was made to keep them in the economic impact area in order to have baseline data from the 1986 Plan. For the same reason, when analyzing the no-action alternative (the 1986 Forest Plan) data and analysis for comparison to other alternatives is already available.

Economic relationships generated within IMPLAN and timber data from Spectrum are used in the Forest Economic Analysis Spreadsheet Tool (FEAST) model. At the Forest-level the FEAST model analyzes impacts of each Forest Plan alternatives.

Broader, more diverse impact areas, such as the one mentioned previously, provide a truer picture of economic interactions within a regional economy. There is strong interest by local government units and others to look at the finest economic scale possible (e.g., the county level). However, this finer scale misrepresents interactions among many local areas and underestimates total impacts associated with the national forests. In addition, finer-scale impact areas require resource specialists to break down recreation and timber activities which are likely beyond the level of precision available in Forest Plan alternatives.

The Models

IMPLAN (Impact Analysis for Planning) is a software package for personal computers that uses the latest national input-output tables from the Bureau of Economic Analysis (BEA). Economic effects to local counties were estimated using an economic input-output model developed with IMPLAN Professional 2.0 The software was originally developed by the Forest Service and is now maintained by the Minnesota IMPLAN Group, Inc (MIG). Data used for the impact analysis was from secondary data for those counties considered to be in the Forest economic impact area. The assumption used in this modeling process was that the impact area comprised the counties within the Forests' designated boundaries. The data

source used in developing models for impact purposes was the most recent county data available from MIG (2000). County data is used in the model to develop one impact response coefficient for each resource or activity in the analysis area.

Input-output analysis gives estimates of employment and income whether an increase or decrease in final demand on certain sectors or industries within an economy. For Forest Service timber, for example, we have looked at the logging camps where timber is used in the first processing step in manufacturing. Impacts include all those industries initially impacted as well as those industries linked with supplies that support production, as well as, workers in those industries who spend wages (known as direct, indirect and induces effects, respectively). Thus, the impact assumes a new demand is made on the economy and estimates what this new increase in final demand will mean in employment and income to that economy. Input-output modeling is an efficiency analysis, which tells how income and jobs are distributed throughout and economy for a given economic impact. Input-output modeling has nothing to do with benefit-cost, which is an efficiency analysis that estimates how efficiently monies are spent on investment activities.

Someone who is unfamiliar with IMPLAN cannot readily perform input-output analysis with it. A detailed explanation of every step in building the model and i resource activity is not included in this appendix.

Important assumptions have been documented in the FEAST electronic spreadsheet, which links IMPLAN response coefficients with resource outputs, as part of the Process Records. Data sources have been described in the EIS.

Economic relationships generated within IMPLAN have been extracted and used in the Forest Economic Analysis Spreadsheet Tool (FEAST) models. The FEAST/IMPLAN information has traditionally been the professionally accepted means of analyzing effects of Forest Plan alternatives. It provides for an area-wide view of relative differences in employment, income and revenue. This model and spreadsheet analyze only the first decade of the planning horizon. The IMPLAN model, utilizing FEAST, helped analyze the economic variation of forest management based on each alternative's proposed management emphasis. The Present Net Value (PNV) analysis provided from IMPLAN estimates PNV over the 100 year planning horizon.

Information used in IMPLAN is specific to Missouri from the year 2000, as later data are NAICS* based and the FEAST model uses SIC† data. Employment and income data was derived from the US Department of Commerce, Bureau of Economic Analysis (BEA) regional economic projections from 2000. Cross tabulations of personal income by major source of earnings by industry, and total full and part time recreation employment by industry projections were included.

Definitions of terms used in the IMPLAN model followed those provided by the BEA and are standards in economic reporting. The "agricultural sector" includes agriculture, forestry, and fishing as a classification of economic data provided by the BEA and Census Bureau.

Basic assumptions of IMPLAN do not include restructuring the economy, nor does it predict the specific future of industry related to the opening or closing of businesses. IMPLAN estimates jobs and income related only to National Forest resources and subsequent changes in proposed management of those resources.

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* *North American Industry Classification System*

† *Standard Industrial Classifications*

IMPLAN does analyze direct, indirect and induced effects by sector based on timber volume by product, and specific measurable recreation, wildlife, fisheries and mineral related resources values.

Data Sources

The IMPLAN model for the forest economic impact area was used to determine total effects of dollar, employment, and income changes in selected industry sectors. Because input-output models are linear, multipliers or response coefficients are calculated once per model and applied to the direct change in final demand. A Forest Service-developed spreadsheet known as "FEAST" (Forest Economic Analysis Spreadsheet Tool) imported IMPLAN impact results, or response coefficients, to each alternative, expressed in units of output. FEAST transforms the dollar impact for a given industry from IMPLAN to resource output units, obtained from SPECTRUM this is the name of the model, not an acronym model (e.g. ccf for timber) or other sources such as NVUM‡ for recreation and wildlife use. Multiplication of resource outputs and the IMPLAN response coefficients within FEAST yields a specific employment and dollar output for each resource or activity. Specifications for developing IMPLAN response coefficients and levels of dollar activity are stated below.

Timber

Sales Data

Sales data was determined by using timber values multiplied by estimated production levels for each alternative.

Use of the Model

Hardwood and softwood sawtimber were processed through the sawmill industry. In the absence of a pulp mill in the local economy, we assumed round wood is exported out of the analysis area. Impacts represent the economic activity occurring in all backward linking sectors associated with the final demand output of the timber industries described above.

IMPLAN showed, that for every $1 million of total timber production in the forest impact area, a given level of dollar value of logs going into the mill result in this impact. Some output may be exported and generate new money for the local economy.

Other Recreation and Wildlife/Fish

Expenditure Data

Recreation, wildlife, and hunting trips were derived from the National Visitor Use and Monitoring survey, (NVUM 2002) done for one-quarter of national forests each year. These results were entered into FEAST to link with IMPLAN impact response coefficients to yield an impact for recreation and wildlife resources.

Federal Expenditures and Employment

Expenditure Data

A Forest budget was estimated for each alternative, and these estimates were used for forest expenditures, some of which have local economic effects. Total Forest obligations by budget object code for FY 2002 were obtained from the National Finance Center and used to identify

‡ *National Visitor Use Monitoring*

expenditures. The proportion of funds spent by program area varied by alternative. The Forest staff examined historical Forest Service obligations to estimate Forest Service employment.

Use of the Model

To obtain an estimate of total impacts from the Mark Twain National Forest spending, salary and non-salary portions of these impacts were handled separately. Non-salary expenditures were determined by using the budget object code information noted above. This profile was run through the model for non-salary expenditures per one million dollars, and the results multiplied by total Forest non-salary expenditures. FEAST was used to make calculations. Local sales to the federal government are treated in the same manner as exports. Salary impacts result from Forest employees spending a portion of their salaries locally.

County Revenue via Payments to States

There are three payments or revenue sources provided to counties via payments to States from the Federal government that are based on the amount of National Forest System land within the county. These payments are a source of revenue for counties and local school districts, and are meant to offset the loss of potential land, goods, and services related tax revenue.

Twenty-five Percent Fund Payment

The first county payment or revenue is the 25 percent fund payment. The 25 percent fund payment is based on gross National Forest receipts within a National Forest, and is allocated to counties by the proportion of total National Forest acreage within each. For example, if a National Forest had $1,000,000 in gross receipts, and County A included 20 percent of National Forest acreage, County B, 50 percent, and County C, 30 percent; then $250,000 (25 percent of gross receipts) would be split $50,000 to County A, $125,000 to County B, and $75,000 to County C.

The Secure Rural Schools and Community Self-Determination Act of 2000 (SRSCS)

The Secure Rural Schools and Community Self-Determination Act of 2000 (SRSCS) signed in October 2000, became a new option to counties to replace the 25 percent fund. It is designed to stabilize annual payments to States and counties over five years, beginning in 2001. The new formula for computing annual payments is based on averaging a State's three highest payments between 1986 and through 1999 to arrive at a compensation allotment or "full payment amount".

Counties could choose to continue to receive payments under the 25 percent fund or to receive the county's proportionate share of the State's full payment amount under SRSCS. All but one county (Boone) within the Mark Twain National Forest are receiving payments under the SRSCS Act, therefore payments to these counties will not be affected by changes in the 2005 Forest Plan. Therefore, this analysis will not address "payments to counties" as a stand-alone indicator.

Payment in Lieu of Taxes (PILT)

Payment in Lieu of Taxes (PILT) is another federal payment to counties. It is based on the number of federal entitlement acres within a county, with adjustments based on the population of the county; a schedule of maximum and minimum per acre payments, which are adjusted annually by the Consumer Price Index; decreased by the previous year's other federal payments, including 25 percent fund payments; and the amount actually appropriated by Congress. Because of this the PILT fluctuates year to year. In recent years, Congress has appropriated approximately one-half to two-thirds of a full PILT payment would be. It is not

possible to predict PILT payments because the major factor in determining financial allocation is Congressional appropriation.

Financial and Economic Efficiency Analysis

Financial efficiency is defined as how well the dollars invested in each alternative produce revenues to the agency. Economic efficiency is defined as how well the dollars invested in each alternative produce benefits to society. Present Net Value (PNV) is used as an indicator of financial and economic efficiency.

The Mark Twain National Forest used a Microsoft Office Excel electronic spreadsheet to calculate PNV for each alternative over a 50-year period. A 4 percent real discount rate, prescribed by Forest Service Handbook (FSH) 1909.17, was used. Decadal and 50 year cumulative present values for program benefits and costs as well as present net values are the product of this spreadsheet. For each decade, an average annual resource value was estimated, multiplied by 10 years, and discounted from the mid-point of each decade.

Financial values for timber came from average 2002 stumpage prices and prices for recreation and wildlife came from RPA, updated to 2004 dollars and transformed to NVUM unit measurements. All values are in 2004 constant dollars. For recreation and wildlife values, a spreadsheet was used to convert from RVDs to “Visits.”

Limitations on Minerals Market Analysis

A number of factors go into analyzing mineral commodity markets. Most operations go through three very costly phases: exploration, development and production. Once discovered, further activity and expense must occur to determine if the deposit is valuable and can be successfully recovered at a reasonable profit. Ore is considered an economically valuable deposit. Value of the mineral commodity and its future anticipated demand are two factors used to evaluate potential for exploration, development, or continued production of a given mined material. However, this is further complicated by a variety of less stable or predictable factors: Discovery of a new mineral source, a decrease in demand, and political instability in critical mineral-producing countries all have direct effects on market value and feasibility of successfully producing a given mineral.

A small fluctuation in price for a mineral commodity, such as a change of 15 cents per pound in the price of lead, as has occurred since 1978, can quickly translate into millions of dollars of gain or loss for the lead industry in Missouri (OOHA 1999).

The introduction of a mineral commodity subsidized by another government often results in an artificially undervalued and under-priced product.

Looking at the last 15 years of revenue, there are seem to be cycles, with the last year reported at an all time low, though exploration and development of lead resources is expected to continue as long as there is a demand for these ores and it is profitable.

Table 11 - Revenue from Lead Leases, Percent of Forest Revenue, and 25 Percent Distribution to Counties, 1988 - 2001

FY	Total Revenue from Lead Leases ($)	Percent of Forest Revenue	25 % Distribution to Counties
1988	6,208,913	73	1,552,228
1989	7,438,174	71	1,859,543
1990	7,314,062	71	1,828,515
1991	5,312,950	66	1,328,237
1992	2,571,270	47	642,817
1993	2,276,734	41	569,183
1994	2,527,117	34	631,779
1995	4,150,597	47	1,037,649
1996	4,955,000	50	1,238,750
1997	5,226,631	53	1,306,657
1998	3,561,499	42	890,374
1999	4,405,516	48	1,101,379
2000	3,631,000	55	907,750
2001	3,089,439	39	600,000
2002	2,750,132	*	790,847
2003	1,822,585	*	331,638

Source: USDA Forest Service, Mark Twain National Forest, 1988–2001, Annual Report; USDI Bureau of Land Management, 2001 - 2003.

** no longer reported by Forest in Annual Report*

Historically, world demand for lead and zinc has increased 2–3 percent per year; however, in 2002, demand remained about the same as in previous years. The transportation industry is the principal consumer of lead with 76 percent used for batteries, fuel tanks, solder seals, bearings, and wheel weights. The remaining lead uses are for electronics, communications (including batteries), ammunition, television glass, protective coatings, ceramics, crystal glass, foil, wire, and specialized chemicals. With the continued industrialization, it is anticipated that demand will continue to increase. However, a continued decrease in value may inhibit traditional increases in demand. In addition, increased recycling of existing lead products will also influence the demand for mining.

For these reasons the minerals program is not included in the IMPLAN and FEAST model as a constant due to lack of decadal data and the volatility of lead prices.

Appendix C

Roadless Area Inventory



Mark Twain
National Forest

Cover image: Hikers at Paddy Creek Wilderness Trailhead

Photographer: Charlie Gill, Mark Twain National Forest

Appendix C

Roadless Area Inventory and Evaluation for Potential Wilderness

Introduction

This appendix displays the process and results of the forest evaluation per 36 CFR 219.17 dated 1982, and revised September 7, 1983. This appendix describes two parts to the process. The first part is an inventory. The inventory is a data-gathering and analysis process to identify roadless areas on the forest. The second part is the evaluation of the roadless areas (that came through the inventory) as potential Wilderness. Generally, for an area to be recommended as an area for wilderness designation, it must first qualify as a "roadless area" under criteria outlined in the Forest Service Directives. Forest Service planning regulations require that we inventory roadless areas within National Forest land during Forest Plan revision (36 CFR 219.17).

References used to guide this forest roadless inventory and evaluation included:

- FSM 1920, Section 1923
- FSH 1909.12, Chapter 7
- Code of Federal Regulations 36, Part 219 Planning, Subpart A, Section 219.17 1982, revised September 7, 1983
- Wilderness Act, Public Law 88-577 (U.S.C. 1131-1136
- Eastern Wilderness Act, Public Law 93-622 (U.S.C. 1132 note)
- Forest RARE II documentation
- R9 Guidance for Roadless Area Inventory for Forest Plan Revision (August 13, 1997)
- R9 Guidance to FSH 0909.12, Chapters 7.2 and 4.19c (January 20, 2000)
- R9 Guidance Roadless Conservation Rule and Roadless Area Inventory (June 11, 2002)
- Recreation Opportunity Spectrum Classification Criteria

History of Roadless Inventory and Wilderness Designation on the Mark Twain National Forest

Wilderness and roadless areas were designated prior to development of the Mark Twain National Forest's 1986 Forest Plan. Hercules Glades Wilderness was designated in 1976. Ten areas were identified through the RARE II process as roadless in 1979; of these, Congress designated six as Wilderness between 1980 and 1984. They are Bell Mountain, Piney Creek, Rock Pile Mountain, Devil's Backbone, Paddy Creek and Irish.

The remaining four RARE II areas (Anderson Mountain, Big Creek, Spring Creek and Swan Creek) were released for non-wilderness management in the Paddy Creek Wilderness Act of 1983 and were allocated to non-wilderness management prescriptions in the 1986 Forest Plan. While these four areas were allocated to multiple-use management, they are listed in the Roadless Area Conservation Rule (RACR) as inventoried roadless areas. Because of this, these four areas were examined during this Forest Roadless Area Inventory process to determine whether they were essentially roadless and undeveloped.

In 1977 during public involvement for the RARE II DEIS the Missouri Wilderness Coalition and Ozark Chapter of the Sierra Club requested that five areas be added to the RARE II inventory process (Big Springs Addition G23-5, Lower Rock Creek G05f 8a, 8b, 9 and 10, North Fork G21W-4, Smith Creek G08-1and Van East Mountain G05F-6). These areas did not meet the roadless criteria and were not included in the RARE II inventory. In the 1986 Forest Plan, these areas were allocated to management prescriptions with a semi-primitive non-motorized Recreation Opportunity Spectrum (ROS) class objective to insure that land management activities would not reduce any roadless character, if present. The Forest received comments regarding these specific parcels in response to the April, 2002 Notice of Intent to revise the 1986 Forest Plan. The commenters felt that these parcels should be recommended for and protected as Wilderness. In response to public comments, all of these parcels were examined during the Forest Roadless Area Inventory process to determine whether they were essentially roadless and undeveloped.

In May of 2005, the RACR was supplanted by the Special Areas; State Petitions for Inventoried Roadless Area Management Rule. This rule allows the governor to petition the Secretary of Agriculture on the management of roadless areas. This new rule also defines inventoried roadless areas as “areas identified in a set of inventoried roadless area maps, contained in the Forest Service Roadless Areas Conservation, Final Environmental Impact Statement, Volume 2, dated November 2000, and any subsequent update or revision of those maps through the land management planning process. The forest’s areas: Anderson Mountain, Big Creek, Spring Creek and Swan Creek, formerly RARE II areas, and part of the RACR, are considered the forest’s roadless inventory until the new inventory from this effort is made official with the signing of the Record of Decision for the Revised Plan and Final Environmental Impact Statement.

Part One: Inventory

The following process was used to identify any potential areas that could meet the roadless area criteria. The results of this inventory will establish a forest roadless area inventory as part of the land management planning process. The objective of the first part of the process is only to determine if an area should be included in the inventory for further evaluation as Wilderness

Step 1 Identify Analysis Areas for Criteria Application

Identification Process

An exhaustive inventory process was used to ensure that every acre of land within the Forest was considered.

The inventory began with a Geographic Information System (GIS) analysis that was used to map all contiguous parcels within the Forest that had one-half mile or less of improved road per one thousand acres. (The function and appearance of a road is a key factor in delineating between improved or unimproved roads. An improved road may have a graveled surface, has

a constructed cross section, properly drains water from the road prism, and is stable for predominant traffic during the normal use season. An unimproved or primitive road is typically developed through use, has no surfacing, may have defined wheel tracks, has no improved drainage structures, and normally is not stable for most traffic or weather conditions.) The Forest used GIS generated transportation maps, the Forest Transportation Atlas, Travel Routes (part of the INFRA database) and field reviews to determine improved roads.

This initial GIS mapping and analysis was accomplished by reviewing every acre of the forest. The mapping process looked for ½ mile of improved road per thousand acres, it also tracked but did not map if lands exceeded this road density. This GIS analysis enabled us to accurately display all parcels of land on the entire Mark Twain National Forest that meet criteria we tell the GIS program to meet. In this analysis, the entire forest was examined, and all areas of at least 1,000 acres were mapped and analyzed based upon the density of roads within its area. All areas identified through this mapping process were carried forward in this process to identify potential roadless areas. A total of 59 areas were mapped in this initial GIS analysis. Paper maps are located in the project record.

To supplement the initial GIS analysis, a second GIS analysis was used to inventory the entire Forest by Recreation Opportunity Spectrum (ROS) class settings. ROS is used to define remoteness of an area. This second GIS analysis used a ½ mile buffering of motorized routes on the Forest (Appendix F describes ROS inventory process). This GIS analysis enabled us to accurately display all parcels of land on the Forest that met the criteria we entered. This ROS analysis was done to further ensure that all lands on the Forest were considered for their potential as a roadless area.

The results of the ROS analysis were compared to the results of the initial GIS mapping exercise using road density. The mapped areas identified in the initial GIS analysis based on road density were overlaid on the ROS analysis map to identify any and all areas over 2,500 acres. This comparative analysis of both GIS exercises led to 3 areas from the ROS analysis being added to 59 areas from the initial road density analysis

In addition to these mapped areas meeting road density and ROS criteria, five areas were included in this analysis that were not identified in the above mapping process. These include the RACR, formerly RARE II areas - Big Creek, Swan Creek Areas of special public interest Big Springs Addition (G23-5), Carmen Springs (G21W-6), Smith Creek.

A total of 67 areas were carried forward in the process.

Delineation of Boundaries

The 67 areas were bounded as recommended in FSH 1909.12, 7.26, using natural features (streams or drainages) or permanent man-made features (improved roads) as much as possible, and drawn on 7.5-minute quadrangle maps. Boundaries were drawn so that they did not cross power lines, state/county roads or major access roads, or cherry-stem around roads into or through the roadless parcel. Boundaries were also located to avoid conflict with important existing and potential public uses outside the boundary, which could result in non-conforming demands on the area if it were to become a Wilderness (R9 direction 8/17/1997). The intent was to delineate the largest possible areas without exceeding the road density criteria that was applied later in step 3.

Another consideration is the shape of the identified parcel of land. Regional direction addresses this by a recommendation to screen out “amoeba” shaped configurations that may meet the minimum acreage requirements but could never be managed to provide the needed

degree of solitude. In the same manner, narrow, elongated, gerrymandered areas are not found suitable when delineating boundaries (RO direction 8/17/1997).

Naming System

For those parcels included in the RACR and formerly RARE II, the RARE II number is used, along with the area's name. (i.e. #9224 Swan Creek

For all other parcels, an alpha-numeric naming system was used to identify each as follows:

G = denotes GIS mapping exercise or R = ROS mapping exercise

21 = District Number

A = District Initial Ava (optional)

1, 2, 3, and so on = assigned parcel number

(Example: G21A -1 is the first parcel on the Ava District, G21A-2 is the second parcel on the Ava District, and G23-01 is the first parcel on the Doniphan-Eleven Point District.)

Two overlapping parcels on the Ava District (G21A-2 and R21A-1) were combined.

Also note that three parcels identified in the original GIS exercise were on lands that had been transferred to another agency, and so were not included in the final list. These parcels were G21C-6 (Cassville Unit), G03-6 (Houston/Rolla Unit), and G04-4 (Poplar Bluff District.) These areas are displayed in Table 1, have a Non-FS remark, but will not be carried forward into the analysis.

Final List of Areas for Inventory

A total 64 parcels of land were carried forward into step 2.

Table 1 – Areas to Inventory

District/Unit Name	Parcel Number / Name	Total acres	Remarks
Ava	G21A-1	3,180	
	G21A-3	2,625	
	G21A-4	2.580	
	G21A-5	40	Adjacent to Wilderness
	G21A-6	20	Adjacent to Wilderness
	G21A-7	20	Adjacent to Wilderness
	R21A-1/G21A-2	3,335	ROS Mapping
	9224 Swan Creek	8,755	RARE II/RACR
	9225 Big Creek	10,825	RARE II/RACR
Cassville	G21C-1	480	
	G21C-2	280	
	G21C-3	80	
	G21C-4	550	
	G21C-5	630	
	G21C-6		Non FS
	G21C-7	1,200	Adjacent to Wilderness
	G21C-8	20	Adjacent to Wilderness
Cedar Creek	G08-1	1,685	Public Interest

District/Unit Name	Parcel Number / Name	Total acres	Remarks
Eleven Point	G23-1	3,080	
	G23-2 Irish Excluded Lands	900	RARE II/RACR/ Adjacent to Wilderness
	G23-3 Irish Excluded Lands	320	RARE II/RACR/ Adjacent to Wilderness
	G23-4	3,200	
	G23-5	3,715	Public Interest
	R23-1	6,390	ROS Mapping
	R23-2	10,065	ROS Mapping
Fredericktown	G05F-1a	555	
	G05F-1b	680	
	G05F-2	80	Adjacent to Wilderness
	G05F-2b	40	Adjacent to Wilderness
	G05F-3	1,080	
	G05F-4	720	
	G05F-5	2,430	Public Interest
	G05F-6	2,130	
	G05F-7	1,040	
	G05F-8a	3,040	Public Interest
	G05F-8b	1,640	Public Interest
	G05F-9	2,320	Public Interest
	G05F-10	4,210	Public Interest
	G05-11	880	
	9222 Anderson Mountain	3,255	RARE II/RACR
Houston/Rolla	G03-1	1,780	
	G03-2	690	
	G03-3	1,160	
	G03-4	440	
	G03-5	2,805	
	G03-6		Non-FS
	G03-7	1,480	
	G03-8	40	Adjacent to Wilderness
	G03-9	160	Adjacent to Wilderness
Poplar Bluff	G04-1	4,380	
	G04-2	2,200	
	G04-3	1,250	
	G04-4		Non-FS
	G04-5	2,080	Public Interest
Potosi	G05P-1	2,735	
	G05P-2a	2,745	
	G05P-2b	2,045	
	G05P-3a	200	Adjacent to Wilderness
	G05P-3b	10	Adjacent to Wilderness
	G05P-3c	20	Adjacent to Wilderness
Salem	G07S-1	2,080	
Willow Springs	G21W-1	1,040	
	G21W-4	5,810	Public Interest
	G21W-5	1,160	Adjacent to Wilderness
	G21W-6	8,600	Public Interest
	9223 Spring Creek	5,340	RARE II/RACR; Includes G21W-2 and G21W-3

Step 2 Apply Inventory Criteria 7.11(1), 2(b and c)

Roadless Area Inventory Criteria

Roadless areas qualify for placement on the inventory of potential wilderness if, in addition to meeting the statutory definition of wilderness, as per FSH 1909.12 Sec 7.1, they meet one or more of the criteria listed in 7.11, and then also meet criteria listed in 7.11(a) which lists criteria for including improvements, and 7.11 (b) which lists criteria for Roadless Areas in the East for areas east of the 100th meridian."

The Wilderness Act, Public Law 88-577 (16 U.S.C. 1131-1136) Section 2c gives the following statutory definition of Wilderness:

> An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

FSH 1909.12, Section 7.11 lists the following criteria:

1. Areas containing 5,000 acres or more.
2. Areas containing less than 5,000 acres but:
    a. Due to physiography or vegetation, they are manageable in their natural condition.
    b. They are self-contained ecosystems such as an island.
    c. They are contiguous to existing wilderness, primitive areas, Administrative endorsed wilderness, or roadless areas in other Federal ownership, regardless of their size.
3. They do not contain improved roads maintained for travel by standard passenger-type vehicles, except as permitted in areas east of the 100th meridian (sec. 7.11b).

Note reference in section above to Section 7.11b, which provides criteria for Roadless Areas in the East including item 5. "The area contains no more than a half mile of improved road for each 1,000 acres, and the road is under Forest Service jurisdiction." These criteria under 7.11 (b) for eastern forests were applied next followed by criteria for improvements in 7.11 (a).

Analysis

The Mark Twain National Forest applied FSH 1909.12, 7.11 requirements including 7.11(a) and 7.11(b), which also helped, assess whether an area met the statutory definition of wilderness.

Core acres listed below are based only on the distance buffered one-half mile from improved roads in accordance with FSH 1909.12, 7.11b and ROS remoteness mapping protocols to identify the semi-primitive motorized class.

Table 2 - Step 2 Results

District/Unit Name	Parcel Number / Name	Total Acres	Core Area
Areas 5,000 acres or more in Size			
Ava	#9224 Swan Creek*	8,755	1,220
	#9225 Big Creek*	10,825	1,340
Doniphan/Eleven Point	R23-1	6,390	1,910
	R23-2	10,065	1,620
Willow Springs	G21W-6	8,600	1,190
	#9223 Spring Creek*	5,340	1,550
	G21W-4	5,810	1,630
Areas less than 5,000 acres that meet 2c criteria			
Ava	G21A-5	40	n/a
	G21A-6	20	n/a
	G21A-7	20	n/a
Cassville	G21C-7	1,200	n/a
	G21C-8	20	n/a
Doniphan/Eleven Point	G23-2 Irish Excluded Lands*	900	n/a
	G23-3 Irish Excluded Lands*	320	n/a
Fredericktown	G05F-2	80	n/a
	G05F-2b	40	n/a
Houston/Rolla	G03-8	40	n/a
	G03-9	160	n/a
Potosi	G05P-3a	200	n/a
	G05P-3b	10	n/a
	G05P-3c	20	n/a
Willow Springs	G21W-5	1,160	n/a
Areas 2,500 to 4,999 Acres in Size			
Ava	G21A-1	3,180	410
	G21A-3	2,625	770
	G21A-4	2.580	130
	R21A-1	3,335	460
Doniphan/Eleven Point	G23-1	3,080	1,680
	G23-4	3,200	590
	G23-5	3,715	970
Fredericktown	G05F-8a	3,040	2,250
	G05F-10	4,210	2,450
	#9222 Anderson Mountain *	3,255	2,110
Houston/Rolla	G03-5	2,805	240
Poplar Bluff	G04-1	4,380	1,500
Potosi	G05P-1	2,735	850
	G05P-2a	2,745	290
Areas Under 2,499 Acres in Size			
Cedar Creek	G08-1	1,685	430
Cassville	G21C-1	480	70
	G21C-2	280	20
	G21C-3	80	0
	G21C-4	550	50
	G21C-5	630	50
Fredericktown	G05F-1a	555	410
	G05F-1b	680	630
	G05F-3	1,080	45
	G05F-4	720	25
	G05F-5	2,430	1,600
	G05F-6	2,130	1,430

District/Unit Name	Parcel Number / Name	Total Acres	Core Area
	G05F-7	1,040	80
	G05F-8b	1,640	1,060
	G05F-9	2,320	880
	G05-11	880	95
Houston/Rolla	G03-1	1,780	290
	G03-2	690	20
	G03-3	1,160	55
	G03-4	440	55
	G03-7	1,480	210
Poplar Bluff	G04-2	2,200	600
	G04-3	1,250	0
	G04-5	2,080	460
Potosi	G05P-2b	2,045	540
Salem	G07S-1	2,080	825
Willow Springs	G21W-1	1,040	390

** denotes RAREII/RACR areas*

Summarized Results of Step 2 Analysis

Table 2 shows all areas by total acres and core area acres. All areas were carried further into the inventory analysis even though at face value, most areas do not offer opportunities for solitude or a primitive and unconfined type of recreation. For many of these areas, the size of these areas is not sufficient to make practicable to manage their preservation and use in an unimpaired condition. These characteristics are further analyzed in Step 4 in regard to 7.11a and 7.11b(4).

Step 3 Apply Road Density Criteria 7.11 (3) and 7.11(b)(5)

In Step 3, existing Forest Plan transportation maps (GIS), the Forest Transportation Atlas, the Travel Routes part of the INFRA database and field review were used to provide data to identify roads in the parcels carried forward from Step 2.

These parcels were analyzed for improved roads against the following criteria:

- The parcel contains no more than a half-mile of improved road for each 1,000 acres, and the road is under Forest Service jurisdiction (FSH 1909.12, 7.11b, criteria 5). Typically, forest system roads with maintenance levels 3 through 5 are considered improved roads.
- On the Mark Twain National Forest, some maintenance level 2 roads would meet the definition under FSH 1909.12, 7.11b, criteria 5 for an improved road under Forest Service jurisdiction. This could include some arterial and collector roads. To determine if roads are improved, information from the INFRA travel routes database and field inspections were utilized.
- Roads under Forest Service Special Use Permits are considered improved roads. Improved roads are defined as being maintained for travel by standard passenger-type vehicles for a further description see the Revised Forest Plan Glossary. (FSH 1909.12, 7.11b, criteria 5)
- Normally, roads under State, County, Townships or other ownerships are not included in a roadless area since the Forest Service does not have authority to regulate use on those roads.

Analysis

Those areas with ½ mile or less of improved road per 1,000 acres are shown in Table 3.

Table 3 - Areas with 1/2 mile or less of Improved Road per 1,000 acres

District/Unit Name	Parcel Number / Name	Miles of Improved Road per 1,000 acres	Included in Roadless Area Conservation Rule
Ava	#9225 Big Creek	0.3	Yes
	G21A-1	0.0	No
	G21A-5	0.0	No
	G21A-6	0.0	No
	G21A-7	0.0	No
Cassville	G21-1	0.0	No
	G21-2	0.0	No
	G21-3	0.0	No
	G21-4	0.0	No
	G21-5	0.0	No
	G21C-8	0.0	No
Cedar Creek	G08-1	0.3	No
Doniphan/Eleven Point	G23-1	0.1	No
	G23-4	0.0	No
	R23-1	0.1	No
	G23-2 Irish Excluded Lands	0.0	Yes
	G23-3 Irish Excluded Lands	0.0	Yes
Fredericktown	G05F-1a	0.0	No
	G05F-1b	0.0	No
	G05F-2	0.0	No
	G05F-2b	0.0	No
	G05F-3	0.2	No
	G05F-4	0.0	No
	G05F-5	0.0	No
	G05F-6	0.0	No
	G05F-7	0.0	No
	G05F-8a	0.2	No
	G05F-8b	0.0	No
	G05F-9	0.0	No
	G05F-10	0.0	No
	G05F-11	0.0	No
	#9222 Anderson Mountain	0.0	Yes
Houston/Rolla	G03-1	0.0	No
	G03-3	0.2	No
	G03-4	0.0	No
	G03-7	0.2	No
	G03-8	0.0	No
	G03-9	0.0	No
Poplar Bluff	G04-5	0.5	No
Potosi	G05P-1	0.4	No
	G05P-2a	0.0	No
	G05P-2b	0.0	No
	G05P-3a	0.0	No
	G05P-3b	0.0	No
	G05P-3c	0.0	No
Salem	G07-1	0.3	No
Willow Springs	G21W-4	0.2	No
	#9223 Spring Creek	0.3	Yes

Parcels with greater than 1/2 mile of improved road per 1,000 acres (roads under Forest Service jurisdiction) listed below do not qualify as roadless under criteria 5 of FSH 1909.12, 7.11b. The road density for each parcel is listed in the following tables.

Table 4 - Areas with 1/2 to 1 mile of Improved Road per 1,000 Acres

District/Unit Name	Parcel Number / Name	Miles of Improved Road per 1,000 acres	Included in Roadless Area Conservation Rule
Ava	9224 Swan Creek	0.6	Yes
	G21A-3	0.6	No
Doniphan/Eleven Point	G23-5	0.9	No
	R23-2	0.7	No
Poplar Bluff	G04-1	0.6	No
Willow Springs	G21W-1	0.8	No
	G21W-5	0.9	No

Table 5 - Areas with more than 1 mile of Improved Road per 1,000 Acres

District/Unit Name	Parcel Number / Name	Miles of Improved Road per 1,000 acres	Included in Roadless Area Conservation Rule
Ava	R21A-1	1.2	No
	G21A-4	1.3	No
Cassville	G21C-7	2.3	No
Houston/Rolla	G03-5	1.4	No
	G03-2	1.5	No
Poplar Bluff	G04-2	1.8	No
	G04-3	3.4	No
Willow Springs	G21W-6	0.9	No

Summarized Results of Step 2 Analysis

All parcels with more than ½ mile of improved road per 1,000 acres are eliminated from further consideration (see tables 4 and 5). Specific parcels that did not meet this criteria of 7.11b include 9224 Swan Creek and R21A-1 at Ava; G21C-7 at Cassville; G23-5 (Big Springs Addition) and R23-2 on the Eleven Point unit; G04-5 (Mud Creek) at Poplar Bluff; as well as G21W-5 and G21W-6 (Carmen Springs) at Willow Springs.

- Only areas that meet the road density criteria under FSH 1909.12, 7.11b(5) were carried forward into Step 4. These are shown in Table 6.

Step 4 Additional Criteria (FSH 1909.12, 7.11a and 7.11b)

This step examines the roadless character of areas that remained at the end of Step 3. Each District was visited to discuss the criteria and gather information needed to complete inventory of these remaining parcels of land for criteria listed under 7.11a and b of FSH 1909.12, which will help determine if areas can be managed under 7.11 2a.

FSH 1909.12 7.11(a) lists acceptable improvements that may be allowed and still qualify the area for inventory. This list was used in examining each parcel for including improvements.

Additional criteria were developed for the Eastern United States (FSH 1909.12, 7.11b) since most if not all land show some signs of human activity and modification. Eight other criteria must be met to qualify for the roadless area inventory in the East.

1. The land is regaining a natural, untrammeled appearance.

2. Improvements to the area are being affected by forces of nature rather than humans and are disappearing or muted.
3. The area has existing or attainable National Forest System ownership patterns, both surface and subsurface, that could ensure perpetuation of identified wilderness values
4. The location of the area is conducive to perpetuation of wilderness values. Consider the relationship of the area to sources of noise, air, and water pollution as well as unsightly conditions that would have an effect on the wilderness experience. The amount and pattern of Federal ownership is also an influencing factor.
5. The area contains no more than a half mile of improved road for each 1,000 acres, and the road is under Forest Service jurisdiction (identified in Step 3.)
6. No more than 15 percent of the area is in non-native, planted vegetation
7. Twenty percent or less of the area has been harvested within the past 10 years.
8. The area contains only a few dwellings on private lands and location of these dwellings and their access needs insulate their effects on natural conditions of Federal lands.

Analysis Table

The following table displays the criteria under FSH 1909.12, 7.11b, and denotes whether parcels meet those criteria, using a Y for yes or N for no. This table also shows the size in acres of the core area in the column headed 4 to compare to the criteria for semi-primitive non motorized ROS classification thereby meeting 7.11, 2a. Those areas with "n/a" are those areas under 5,000 acres that meet the criteria under FSH 1909.12, 7.11, 2c being contiguous to existing wildernesses SPNM core area is not applicable. In addition, the road density for each area is shown in miles in Table 6 under column headed 5.

Table 6 – Analysis of FSH 1909.12, 7.11b Criteria 1 through 8.

Area Number/Name	Area Size (total acres)	Criteria for Roadless Areas in the East (FSH 1909.12, Chapter 7, Section 7.11b) (Number in each column refers to list above) 1	2	3	4 (core acres)	5 (miles)	6	7	8	New Roadless Area Inventory
Ava										
G21A-1	3,180	N	N	N	410	0.0	Y	Y	N	N
G21-5	40	Y	Y	Y	n/a	0.0	Y	Y	Y	Y
G21-6	20	Y	Y	Y	n/a	0.0	Y	Y	Y	Y
G21-7	20	Y	Y	Y	n/a	0.0	Y	Y	Y	Y
9225 Big Creek*	10,825	N	N	Y	1,340	0.3	Y	Y	Y	N
Cassville										
G21C-1	480	Y	Y	Y	70	0.0	Y	Y	Y	N
G21C-2	280	Y	Y	Y	20	0.0	Y	Y	Y	N
G21C-3	80	Y	Y	Y	0	0.0	Y	Y	Y	N
G21C-4	550	Y	Y	Y	50	0.0	Y	Y	Y	N
G21C-5	630	Y	Y	Y	50	0.0	Y	Y	Y	N
G21C-8	20	Y	Y	Y	n/a	0.0	Y	Y	Y	Y
Cedar Creek										
G08-1	1,685	N	N	Y	430	0.3	Y	Y	Y	N
Doniphan/Eleven Point										
G23-1	3,080	Y	Y	Y	1,680	0.1	Y	Y	Y	N
G23-2*	900	Y	Y	Y	n/a	0.0	Y	Y	Y	Y
G23-3*	320	Y	Y	Y	n/a	0.0	Y	Y	Y	Y

Area Number/Name	Area Size (total acres)	Criteria for Roadless Areas in the East (FSH 1909.12, Chapter 7, Section 7.11b) (Number in each column refers to list above) 1	2	3	4 (core acres)	5 (miles)	6	7	8	New Roadless Area Inventory
G23-4	3,200	N	N	Y	590	0.0	Y	Y	Y	N
R23-1	6,390	N	N	Y	1,910	0.1	Y	Y	Y	N
Fredericktown										
G05F-1a	555	Y	N	N	410	0.0	Y	Y	N	N
G05F-1b	680	N	N	N	630	0.0	Y	Y	N	N
G0F5-2	80	Y	Y	Y	n/a	0.0	Y	Y	Y	Y
G05F-2b	40	Y	Y	Y	n/a	0.0	Y	Y	Y	Y
G05F-3	1,080	Y	Y	Y	45	0.2	Y	Y	Y	N
G05F-4	720	Y	Y	Y	24	0.0	Y	Y	Y	N
G05F-5	2,430	N	N	Y	1,600	0.2	Y	Y	Y	N
G05F-6	2,130	N	N	Y	1,430	0.0.	Y	Y	Y	N
G05F-7	1,040	N	Y	Y	80	0.0	Y	Y	Y	N
G05F-8a	3,040	N	N	Y	2,250	0.2	Y	Y	Y	N
G05F-8b	1,640	Y	N	Y	1,060	0.9	Y	Y	Y	N
G05F-9	2,320	Y	N	Y	880	0.0	Y	Y	Y	N
G05F-10	4,210	Y	N	Y	2,450	0.0	Y	Y	Y	N
G05F-11	880	Y	Y	Y	95	0.0	Y	Y	Y	N
9222 Anderson Mtn*	3,255	N	N	Y	2,110	0.0	Y	Y	Y	N
Houston/Rolla										
G03-1	1,730	N	N	Y	290	0.0	Y	Y	Y	N
G03-3	1,160	Y	N	Y	55	0.2	Y	Y	Y	N
G03-4	440	Y	Y	Y	55	0.0	Y	Y	Y	N
G03-7	1,480	N	N	Y	210	0.2	Y	Y	Y	N
G03-8	40	Y	Y	Y	n/a	0.0	Y	Y	Y	Y
G03-9	160	Y	Y	Y	n/a	0.0	Y	Y	Y	Y
Poplar Bluff										
G04-5	2,080	Y	N	Y	825	0.5	Y	Y	Y	N
Potosi										
G05P-1	2,735	N	N	Y	850	0.4	Y	Y	Y	N
G05P-2a	2,745	Y	N	Y	290	0.0	Y	Y	Y	N
G05P-2b	2,045	Y	N	Y	540	0.0	Y	Y	Y	N
G05P-3a	200	Y	Y	Y	n/a	0.0	Y	Y	Y	Y
G05P-3b	10	Y	Y	Y	n/a	0.0	Y	Y	Y	Y
G05P-3c	20	Y	Y	Y	n/a	0.0	Y	Y	Y	Y
Salem										
G07S-1	2,080	Y	N	Y	825	0.3	Y	Y	Y	N
Willow Springs										
G12W-4	5,810	N	N	Y	1.630	0.2	Y	Y	N	N
9223 Spring Creek*	5,340	Y	N	Y	1,550	0.3	Y	Y	N	N

** Denotes RAREII/RACR*

Analysis Narrative

With the exception of the core area criteria for contiguous areas, an area must meet all eight criteria in order to qualify as an inventoried roadless area in the East.

Of the 48 specific areas carried forward in step 4, 13 parcels meet the road density criteria that are contiguous to a designated Wilderness and meet the criteria for areas under 5,000 7.11, 2c. These are noted in Table 6 under column titled “new roadless area inventory”.

Criteria 4

For a close examination of the remaining 35 areas, it is important to understand the application of criteria 4 (perpetuation of wilderness values and experience).

Areas less than 5,000 acres were considered manageable in their natural condition; conducive to perpetuating wilderness values; and able to provide “outstanding opportunities for solitude or a primitive and unconfined type of recreation”, if they could provide a semi-primitive, non motorized (SPNM) opportunity to meet **criteria 7.11, 2a**.

In general, a core area of approximately 2,500 acres or more is needed to provide a semi-primitive opportunity according to the ROS handbook. R9 guidance advises the use of ROS as a guide in helping determine which areas qualify as roadless inventory areas.

Specifically, we determined that areas, regardless of size, must have an approximate core area of at least 2,500 acres meeting semi-primitive non motorized opportunity. We recognized that the “core" may be less than 2,500 acres if "solitude and primitive and unconfined recreation" could be provided based on topography, water bodies, proximity to roads, population centers and other sights and sounds of human activity. Appendix F of the Forest Plan states the recommended size of an area for management as SPNM; it may be less than 2,500 acres if the lands are contiguous to the primitive area or within a designated Wilderness.

As shown in Table 6, there are three parcels of land with a core area over 2,000 acres in size (G05F-8a and 10 part of Lower Rock Creek) and #9222 Anderson Mountain) none of these areas are adjacent to designated Wilderness though all are adjacent to private lands. Currently all areas are almost completely (over 90%) surrounded by private lands which will have influence over the solitude or a primitive and unconfined type of recreation, manageability of the natural condition, and make impracticable the areas preservation and use in an unimpaired condition. None of these three areas meets the semi primitive non motorized objectives to provide a SPNM opportunity.

Table 6 displays nine parcels of land with core areas between 1,000 and 2,000 acres. None of these are adjacent to designated Wilderness. Due to the location of private lands which influences the solitude or a primitive and unconfined type of recreation, manageability of the natural condition, and make impracticable the areas preservation and use in an unimpaired condition. These include 9222 Anderson Mountain, G05F -5 (Van East), G05F -6, G05F -7, G05F-8b and G05F-9 (Lower Rock Creek) within the Fredericktown District, and G21W-6 and 9223 Spring Creek on the Willow Springs unit.

Table 6 also identifies twenty-three parcels where the core areas are less than 1,000 acres. These areas have such small core areas that the opportunity for solitude or a primitive and unconfined type of recreation is not achievable due to the proximity of improved roads and private land.

All Criteria in Specific Areas

In some parcels the location of private lands or the amount of Forest Service ownership as outlined in **7.11b, criterion 3 and 8** cannot be met. Ownership is a factor in G21A-1 at Ava and G05F-2 at Fredericktown. Many other parcels contain private lands with dwellings and roads. The location of these improvements is not conducive to wilderness values. This is evident in regard to most parcels on the Ava, Fredericktown, and Willow Springs units, especially G21A-1; G05F-1, G05F-5, G05F-8a, G05F-8b, G05F-9, G05F-10 (Lower Rock Creek) and 9223 Spring Creek.

Again, criteria from the ROS classification system were used to identify areas that met **7.11b criteria 2, 4, 8** above. One of the criteria from the ROS system relevant to identifying roadless areas is evidence of humans, which is used as an indicator of the opportunity to recreate in environmental settings having varying degrees of human influence or modification. This indicator is primarily based on the visual impact and affect of modifications on the recreation experience, as distinguished from only the physical existence of modifications. It takes into account the ability of the landscape to conceal evidence of human modifications. The deciduous forest found in Missouri is a primary factor under this consideration, because trees are without leaves for about five months, thereby reducing the screening effect of the forest from uses on other ownerships both within and adjacent to the area. We used the criteria for Primitive or Semi-Primitive Non Motorized opportunities per ROS handbook to help identify areas where "the imprint of man's work [is] substantially unnoticeable."

None of the parcels provides the SPNM experience core of 2,500 acre (**criteria 4**), due in part to the proximity to improved roads. Many of these improved roads are located on private lands adjacent to the identified parcels, though some are under Forest Service jurisdiction. This is evident in regard to all parcels on the Fredericktown District, including #9222 Anderson Mountain; G05F-5 (Van East); G05F-8a, G05F-8b, G05F-9, G05F-10(Lower Rock Creek); 9225 Big Creek at Ava; as well as parcels G21W-1 and G21W-6 on the Willow Springs unit.

In many of the parcels open, unimproved system roads are part of the Forest Transportation System, are open to ATVs in accordance with State Laws and Regulations, and are still evident to forest users. This is especially true within 9225 Big Creek on the Ava unit and G23-4 and R23-1 on the Eleven Point, G05P-1 on Potosi, and G21W-6 at Willow Springs. Therefore the imprint of man's work is substantially noticeable within these lands, which **does not meet 7.11b criteria 1 and 2.**

Other parcels, including 9224 Swan Creek on the Ava unit, G04-5 on Poplar Bluff, G21W-4 (North Fork) on the Willow Springs Unit, and G08-1 (Smith Creek on the Cedar Creek District) contain improvements such as closed roads, special uses roads or facilities which are still evident to forest users.

Only two of the RACR/RARE II areas the Irish Excluded Lands G21-2 and 3, which are contiguous to the Irish Wilderness currently meet the criteria for the new roadless inventory in accordance with criteria found FSH 1909.12 Chapter 7.11, 7.11a, and 7.11b for potential wilderness in the East. None of the other areas inventoried through the forest plan revision process meet those criteria that were used in conjunction with the statutory definition from the Wilderness Act to identify wilderness characteristics for lands within the Mark Twain NF.

Specifics of each parcel of land are documented in the planning record. This documentation includes a map in addition to a listing of area improvements including roads and any other uses that affect the Forest Service ability to manage lands to preserve wilderness character on parcels of land if found.

Results

Forty-eight areas were examined in step 4; thirty-five areas were removed from the inventory.

Thirteen parcels met the criteria to qualify for inventory as roadless areas for potential wilderness for in the East.

Each of these parcels is contiguous to an existing Wilderness, and therefore meets the criteria for areas less than 5,000 acres (FSH 1909.12, 7.11a, 2c), as well as for road density (FSH 1909.12, 7.11b, 5). Two of these are RACR areas, as indicated with an *.

- Ava: G21A-5, G21A-6, G21A-7
- Cassville: G21-8
- Doniphan/Eleven Point: G23-2 Irish Excluded*, G23-3 Irish Excluded*,
- Fredericktown:G05F-2 , G05F-2b
- Houston/Rolla: G03-8 , G03-9
- Potosi: G05P-3a , G05P-3b, G05P-3c

Step 5 Conclusion of Final Roadless Area Inventory

The Mark Twain NF conducted an inventory to begin a forest evaluation per 36 CFR 219.17 dated 1982, and revised September 7, 1983 to identify roadless areas within the forest boundary. The process used is based upon the definition of wilderness found in the Wilderness Act. Specialist reviewed in detail 64 parcels of land and identified 13 to be included in the new roadless area inventory in accordance with the State Petitions for Inventoried Roadless Area Management Rule.

This process utilized criteria found in FSH 1909.12, Chapter 7 to objectively determine if parcels of land within the forest qualify as roadless areas. East of the 100th Meridian areas are compared to additional criterion found in 7.11b, along with those in 7.11 and 7.11a that are used for the rest of the United States. These criterion help personnel place areas on the inventory of potential Wilderness.

Two of these are tracts on the Doniphan/Eleven Point unit are lands excluded from the Irish Wilderness within legislation designating the Irish Wilderness. These and the other eleven areas are contiguous to existing Wilderness were either acquired since the designation of each Wilderness area or previously did not meet the criteria for inclusion due to improvements or management activity.

For the evaluation step, each parcel of land will be given a new numeric identifier that ties the area to the Region (9), Forest (5), district and sequential number, e.g. 952101. These parcels are listed below by District and adjoining Wilderness area; approximate acreage is listed.

Table 7 - Final Roadless Area Inventory

District/Unit Name	Adjacent to:	Parcel Number	New Numeric Identifier	Acres
Ava	Hercules Glades Wilderness	G21A-5	952101	40
		G21A-6	952102	20
		G21A-7	952103	20
Cassville	Piney Creek Wilderness	G21C-8	952104	20
Doniphan/Eleven Point	Irish Wilderness	G23-2	952301	900
		G23-3	952302	320
Fredericktown	Rock Pile Wilderness	G05F-2	950504	80
		G05F-2b	950505	40
Houston/Rolla	Paddy Creek Wilderness	G03-8	950301	40
		G03-9	950302	160
Potosi	Bell Mountain Wilderness	G05P-3a	950501	200
		G05P-3b	950502	10
		G05P-3c	950503	20

Part Two: Evaluation of Forest Inventoried Roadless Areas

This part consists of the Evaluation of the Mark Twain NF's thirteen inventoried roadless areas. Evaluations were completed for the eleven parcels of land that adjoin existing Wilderness areas and that were placed on the new Forest Roadless Area Inventory. All of these roadless areas share common factors for capability, availability, manageability and demand. Following this section, each Wilderness is individually discussed in relation to the specific parcels to be included within a modified boundary.

The Irish Wilderness Excluded Lands have been previously studied. When the Irish Wilderness was designated in May of 1984, Congress excluded these lands from the Irish Wilderness to allow for mineral exploration. The evaluation of these lands is found at the end of this part before the Conclusion.

Capability

All of these parcels of land fit two of the primary criteria of "potential Wilderness" as defined in Forest Service Handbook 1909.12, which are:

- Areas containing less than 5,000 acres but they are contiguous to existing wilderness, regardless of their size.
- The area contains no more than a half-mile of improved road for each 1,000 acres, and the road is under Forest Service jurisdiction.

All areas are regaining a natural, untrammeled appearance. The forces of nature are affecting improvements within these areas, and they have disappeared or are muted.

These parcels have the same type of topography, geography and vegetation as the adjacent Wildernesses and appear natural and free from disturbance by humans. All are within a subsection of the Ozark Highlands, as noted in individual descriptions that follow.

Challenges for the existing Wilderness areas are reflected in recent visitor exit surveys conducted at trailheads serving Bell Mountain, Hercules, Irish, and Paddy Creek Wildernesses, which indicated that most visitors were satisfied with the experience they had, and reported physical and social settings to be within guidelines of the Forest Plan.

None of these parcels contains any special features, but contributes to the whole of the existing Wilderness.

Manageability

Due to the location of all parcels, their addition to the existing Wilderness area will increase the Forest's ability to mange this enduring resource and their natural character. All lands recommended for study are regaining their natural character and signs of human use are disappearing. Many parcels have been managed under standards and guidelines, which reduce the amount of management activities conducted within those land allocations. These include management prescriptions 6.1, 6.2 and 8.1.

Even lands currently under other management prescriptions have not been actively managed primarily due to their location adjoining a Wilderness or their small size.

Availability

None of the parcels recommended for study are similar to examples listed in Forest Service Handbook 1909.12, 7.22a as lands generally unavailable for Wilderness.

There are no current uses on the acreages that would preclude a Wilderness designation.

No other resource potential is identified for these parcels though any management considerations due to fire, insect infestations or disease would be the same as those for the designated Wilderness areas under the 1986 Forest Plan.

The majority of current use of the Wildernesses on the Mark Twain National Forest is recreation, in a manner similar to use throughout the Forest, with no motorized or mechanized use. In general, Wilderness use is concentrated on weekends in spring and fall. Overall use has remained nearly constant for the past five years. Hunting and hiking pressure seems to be about the same as in the past five years. Horseback riding in some Wilderness areas has increased while others show declines.

Many hikers choose to hike in Wilderness, not because there is an outstanding opportunity for solitude or a primitive or unconfined type of recreation, but for other reasons, including:

- most of our Wildernesses have trails that offer a variety of scenic views,
- trails are a length that can be hiked in a day or two, generally without excessive backtracking,
- Wilderness are located throughout the forest in various land blocks so that at least one is relatively close to most of our recreating publics,
- there are loop trails of various lengths,
- trails have trailhead camping facilities, and
- each area has a free map.

Likewise, many hunters don’t choose Wilderness because there is an outstanding opportunity for solitude or a primitive or unconfined type of recreation. Instead, Wilderness was chosen because:

- it is close,
- they hunted there before it was designated as Wilderness,
- they think they may be successful, or
- they want to hunt where they won’t be competing with (or potentially a target for) road hunters or a large number of other hunters.

Need

Carrying capacity was calculated for Wilderness on a forest utilizing the carrying capacities set up in Forest-wide direction on page IV-27 of the 1986 Forest Plan, the total number of acres of Wilderness times a capacity coefficient of 1.6 Recreation Visitor Days per acre per year gives a total capacity of 101,410 RVDs of primitive use per year. Current use within Forest Wildernesses is about 60% of this capacity overall, though an area may sometimes be overcrowded due to its specific location.

Visitor exit surveys conducted in 1999 at trailheads serving Bell Mountain, Hercules, Irish and Paddy Creek Wildernesses indicate that most visitors were satisfied with the experience they had, and reported physical and social settings to be within guidelines of the Forest Plan. However, several visitors indicated that they found the primitive nature of trails and trail markings, and lack of facilities within Wildernesses to be too challenging for their liking. Most of these individuals were not seeking a wilderness experience, and many of them did not understand the difference between Wildernesses and developed recreation areas.

Wilderness recreation opportunity is well distributed in Missouri and Arkansas. As noted in the Ozark Ouachita Highlands Assessment, only 7 out of the 107 principal cities (those with a population of 50,000 or greater) are more than 250 miles from a congressionally- designated Wilderness within the draw area.

Bell Mountain Wilderness Additions (Potosi District)

These three additions are located along the western boundary of the existing Wilderness, between the Bell Mountain Wilderness and Highway A (see map on page C – 28.) These areas qualify as roadless due to their location along an existing Wilderness and the lack of roads or motorized trails.

Table 8 – Bell Mountain Wilderness Additions

Area Number	Gross Acres	FS acres	% USFS lands
950501	188	188	100
950502	10	10	100
950503	20	20	100

Two of the parcels, 950502 and 950503, block in the boundary of the Wilderness. Parcel 950501, which is larger, fills in the boundary and extends to Highway A. All of these parcels will be affected by traffic on Highway A to the same degree as the existing Wilderness, and to some extent will serve as a buffer to its center.

There are no current activities occurring within these acreages, which are managed for semi-primitive, non-motorized recreation opportunities. All are found within the St. Francois Knobs and Basins subsection of the Ozark Highlands.

For more specific information concerning these parcels, refer to the Bell Mountain Wilderness description under Management Prescription 5.1 of the Revised Forest Plan.

This Wilderness receives quite a bit of use due to its location just north of two state parks and the paved road system around it. These additions totaling 230 acres include only lands owned by the Forest Service and are a logical expansion of the Wilderness boundary.

Hercules Glade Wilderness Additions (Ava Unit)

These three additions are located along the boundary of the existing Wilderness area, and qualify as roadless due to their location along the existing Wilderness and the lack of roads or motorized trails (see map on page C – 23.)

Table 9 – Hercules Glade Wilderness Additions

Area Number	Gross Acres	FS acres	% USFS lands
952101	40	40	100
952102	20	20	100
952103	20	20	100

There are no current activities occurring on these acreages, which are managed for semi-primitive, motorized recreation opportunities. These parcels have the same type of topography, geography and vegetation as the Hercules Glade Wilderness and appear natural and free from disturbance by humans. All are within the White River Hills subsection of the Ozark Highlands and the glade ecosystem.

All parcels help block in the boundary of the Wilderness. Two parcels, 952101 and 952102, fill in gaps within the existing boundary; the third parcel expands a corner along Beaver Creek in the northwest corner.

For more detailed information concerning these parcels, refer to the Hercules Glade Wilderness description under Management Prescription 5.1 of the Revised Forest Plan.

These additions, totaling eighty acres include only lands owned by the Forest Service and are a logical expansion of the Wilderness boundary.

Paddy Creek Wilderness Additions (Houston Unit)

These two additions (see map on page C – 24) are located along the boundary of the existing Wilderness and fall within the land between the Paddy Creek Wilderness and improvements that affect quality of recreation opportunities found within the Wilderness.

Table 10 – Paddy Creek Wilderness Additions

Area Number	Gross Acres	FS acres	% USFS lands
950301	40	40	100
950302	160	160	100

There are no current activities occurring on these acreages, which are managed for roaded natural recreation opportunities. All are found within the Gasconade River Hills subsection of the Ozark Highlands.

Both parcels help block in the boundary of the Wilderness. Parcel 950301 blocks in the boundary along a powerline, which forms the southern boundary; the other parcel fills in a corner that expands the boundary to Slabtown road on the northwestern edge.

For more detailed information concerning these parcels, refer to the Paddy Creek Wilderness description under Management Prescription 5.1 of the Revised Forest Plan.

This Wilderness receives a lot of use due to its location south of Fort Leonard Wood Military Reservation and the road system around it. These additions, totaling 200 acres include only lands owned by the Forest Service and are a logical expansion of the Wilderness boundary.

Piney Creek Wilderness Addition (Cassville Unit)

This addition is located along the boundary of the existing Wilderness.

Table 11 – Piney Creek Wilderness Addition

Area Number	Gross Acres	FS acres	% USFS lands
952104	20	20	100

This parcel (see map on page C – 24 has the same type of topography, geography and vegetation as the Piney Creek Wilderness and appears natural and free from disturbance by humans. It is within the White River Hills subsection of the Ozark Highlands.

For more detailed information concerning this parcel, refer to the Piney Creek Wilderness description under Management Prescription 5.1 of the Revised Forest Plan.

The parcel helps block in the boundary of the Wilderness along an arm of Table Rock Lake and its acquisition contributes to the area's solitude since access is no longer needed to the lake and uses on once private ownership have ended. This addition, totaling twenty acres includes only land owned by the Forest Service and is a logical expansion of the Wilderness boundary.

Rock Pile Mountain Wilderness Additions (Fredericktown Unit)

These two additions are located along the boundary of the existing Wilderness (see map on page C – 26.)

Table 12 – Rock Pile Mountain Wilderness Additions

Area Number	Gross Acres	FS acres	% USFS lands
950504	80	80	100
950505	40	40	100

There are no current activities occurring on these acreages, which are managed for semi-primitive, motorized recreation opportunities. These parcels have the same type of topography, geography and vegetation as the Rock Pile Mountain Wilderness and appear natural and free from disturbance by humans. All are within the St. Francois Knobs and Basins subsection of the Ozark Highlands.

All parcels help block in the boundary of the Wilderness and acquisition of private lands contribute to the area's solitude since uses on once private ownership have ended. Parcel 950504 borders Trace Creek almost three quarters of a mile; the other parcel is along FS Road 2124 and the Wilderness trailhead.

For more detailed information concerning these parcels, refer to the Rock Pile Mountain Wilderness under Management Prescription 5.1 of the Revised Forest Plan.

These additions, totaling 120 acres include only lands owned by the Forest Service and are a logical expansion of the Wilderness boundary.

Irish Wilderness Excluded Lands (Eleven Point Unit)

When Congress designated the Irish Wilderness in May of 1984, these two parcels of land (see map on page C – 25) were excluded from the Wilderness area to allow for mineral exploration. These areas qualified as roadless at that time and have been managed to perpetuate those wilderness qualities. There are no roads or motorized trails located within these areas.

Table 13 – Irish Wilderness Additions

Area Number	Gross Acres	FS acres	% USFS lands
952301	900	900	100
952302	320	320	100

There are no current uses within these acreages and all are currently managed as wilderness areas. These parcels have the same type of topography, geography and vegetation as the Irish Wilderness and appear natural and free from disturbance by humans. All are found within the Current River Hills subsection of the Ozark Highlands.

For more information, refer to the Irish Wilderness description under Management Prescription 5.1. Current management of the Irish Excluded Lands is described under Management Prescription 8.1 of the 1986 Forest Plan.

These additions, totaling 1,220 acres, include only lands in Forest Service ownership. Area 952301 on the northwestern corner will fill in the area north of the Eleven Point National Scenic River boundary, east and south of Oregon County Road 149-164 and the Irish Wilderness' eastern boundary. Area 952302 is located on the eastern side of the Wilderness and fills in half of Section 13 west of Highway J.

Note: acreage for parcel 952301 has always been 900 acres but has been stated incorrectly since the 1970s.

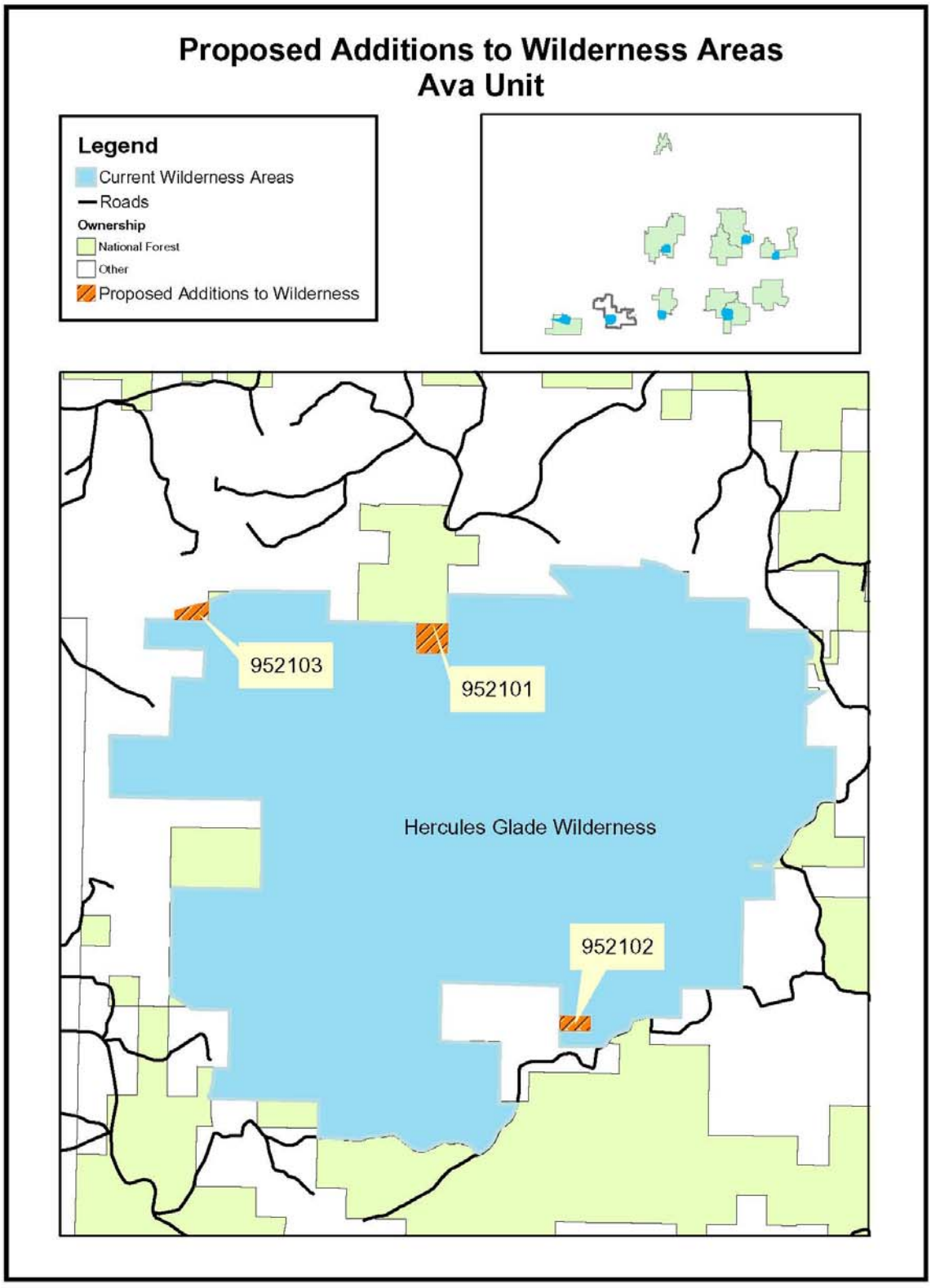
Conclusion

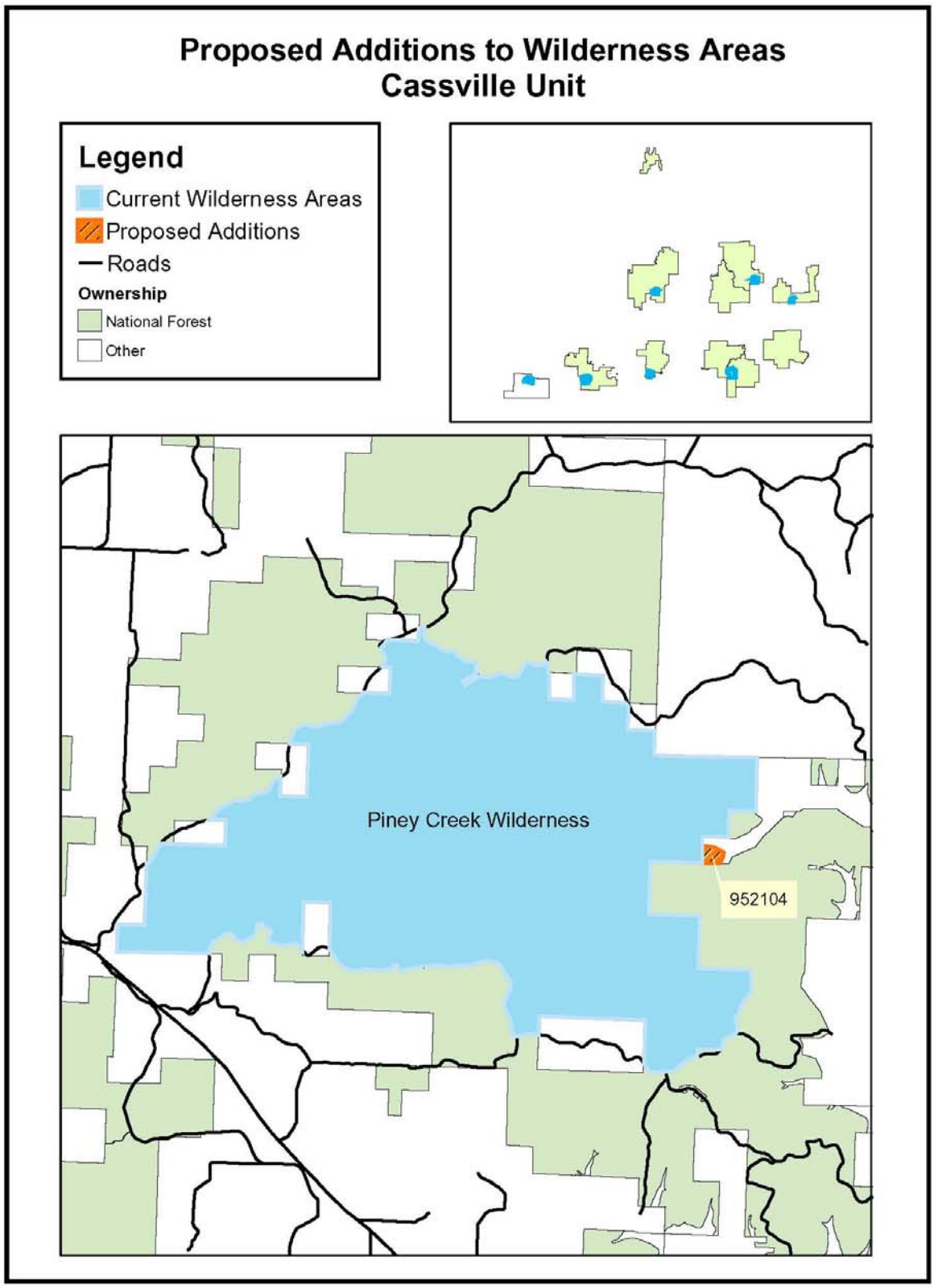
All thirteen parcels evaluated were selected for inclusion in Forest Plan alternatives 1-4. Under these alternatives, Forest Inventoried Roadless Areas evaluated will be allocated to management prescription 8.1 as outlined in the Revised Forest Plan. Standards and guidelines for these Areas would be the same as the current management for its adjacent Wilderness, except for the Irish Wilderness Excluded Lands. These two areas are currently under MP 8.1 and managed with specific standards and guidelines in accordance with the Irish Wilderness Act of 1984, Public Law 98-289.

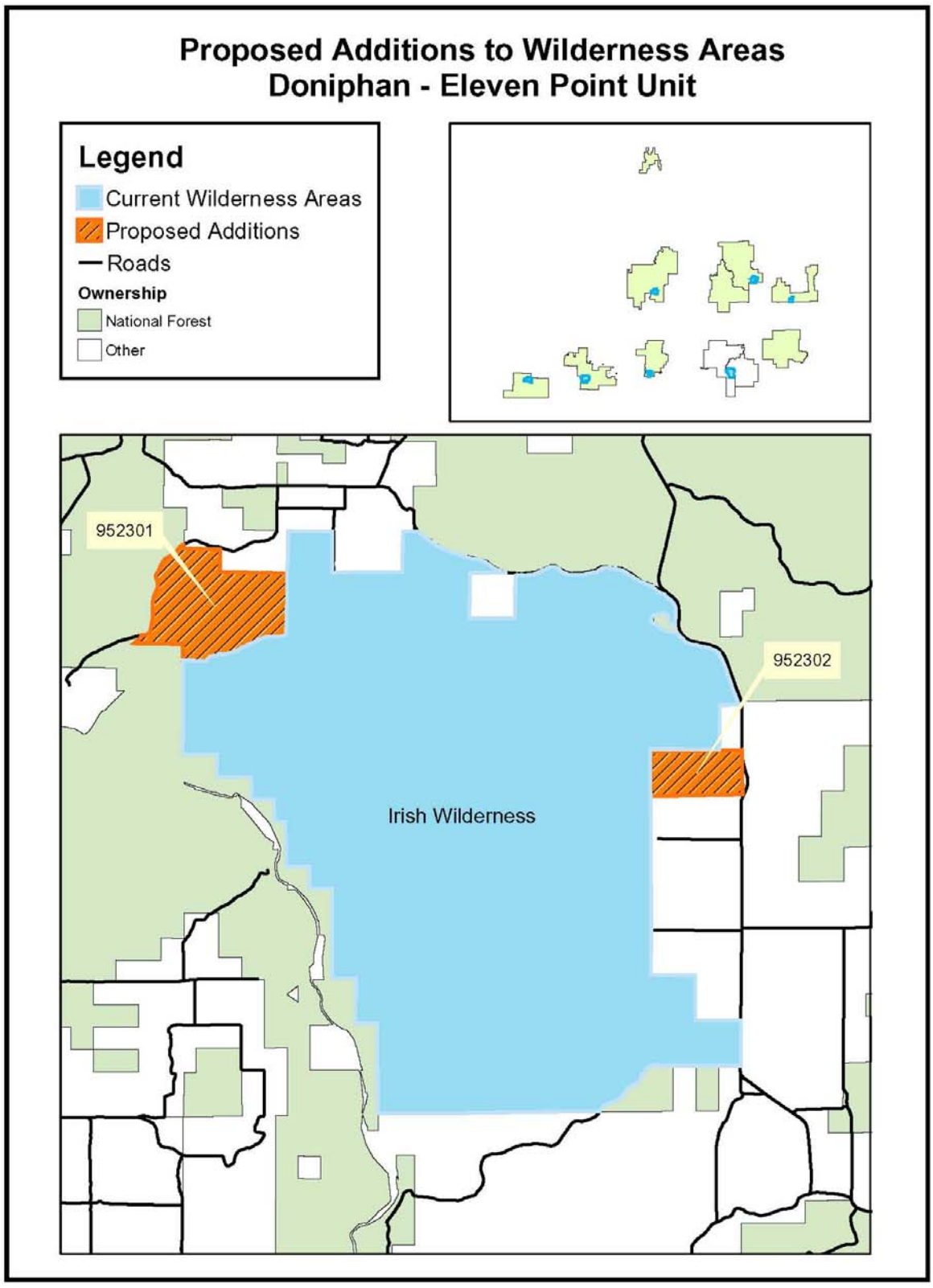
Table 8 lists and displays how proposed additions are included in Forest Plan revision alternatives. See Chapter 3 of the Final Environmental Impact Statement for details and comparison of effect of recommending various alternatives for Wilderness designation.

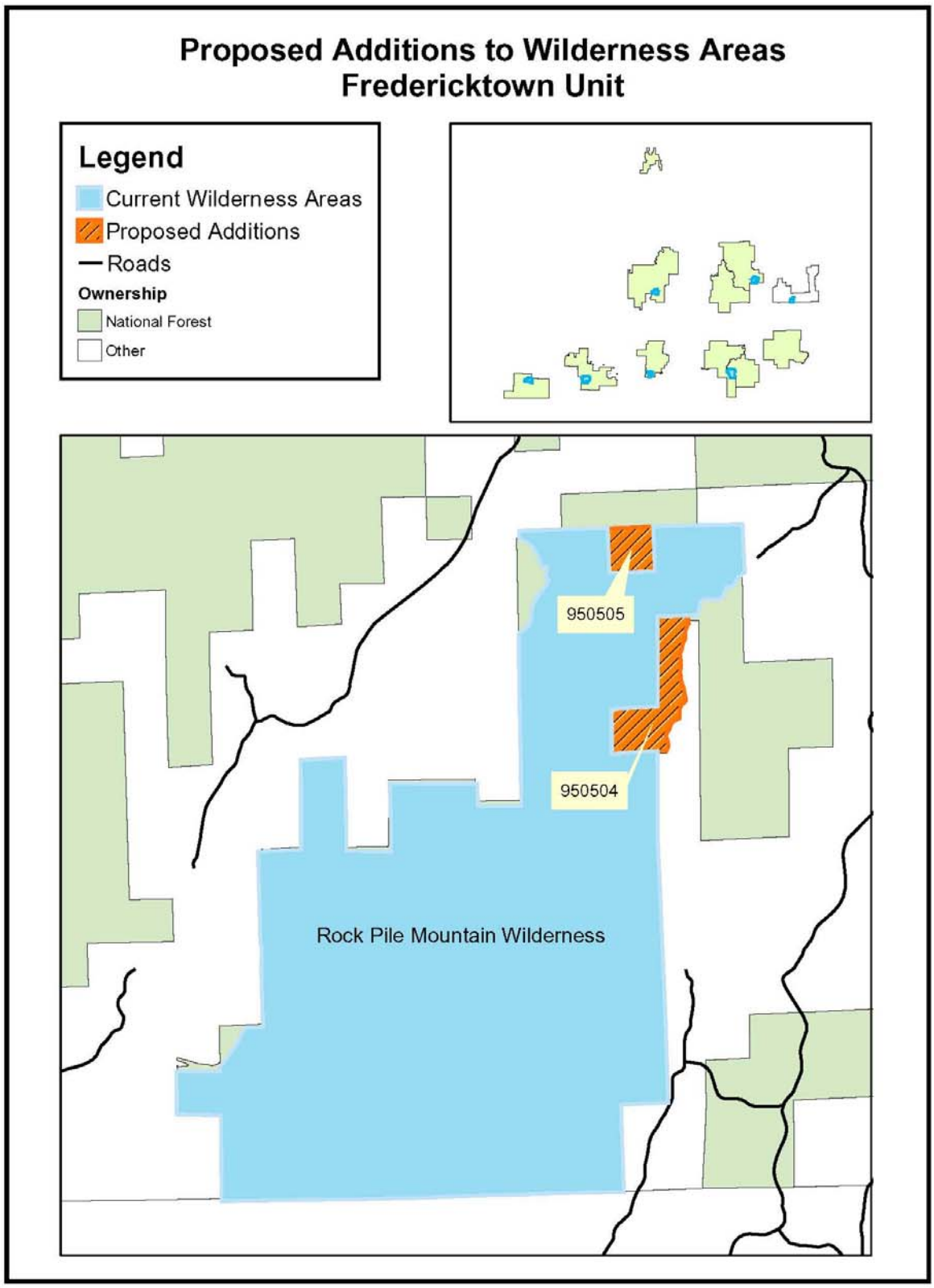
Table 14 - Forest Inventoried and Evaluated Roadless Areas Included in Proposed Alternatives as Potential Wilderness

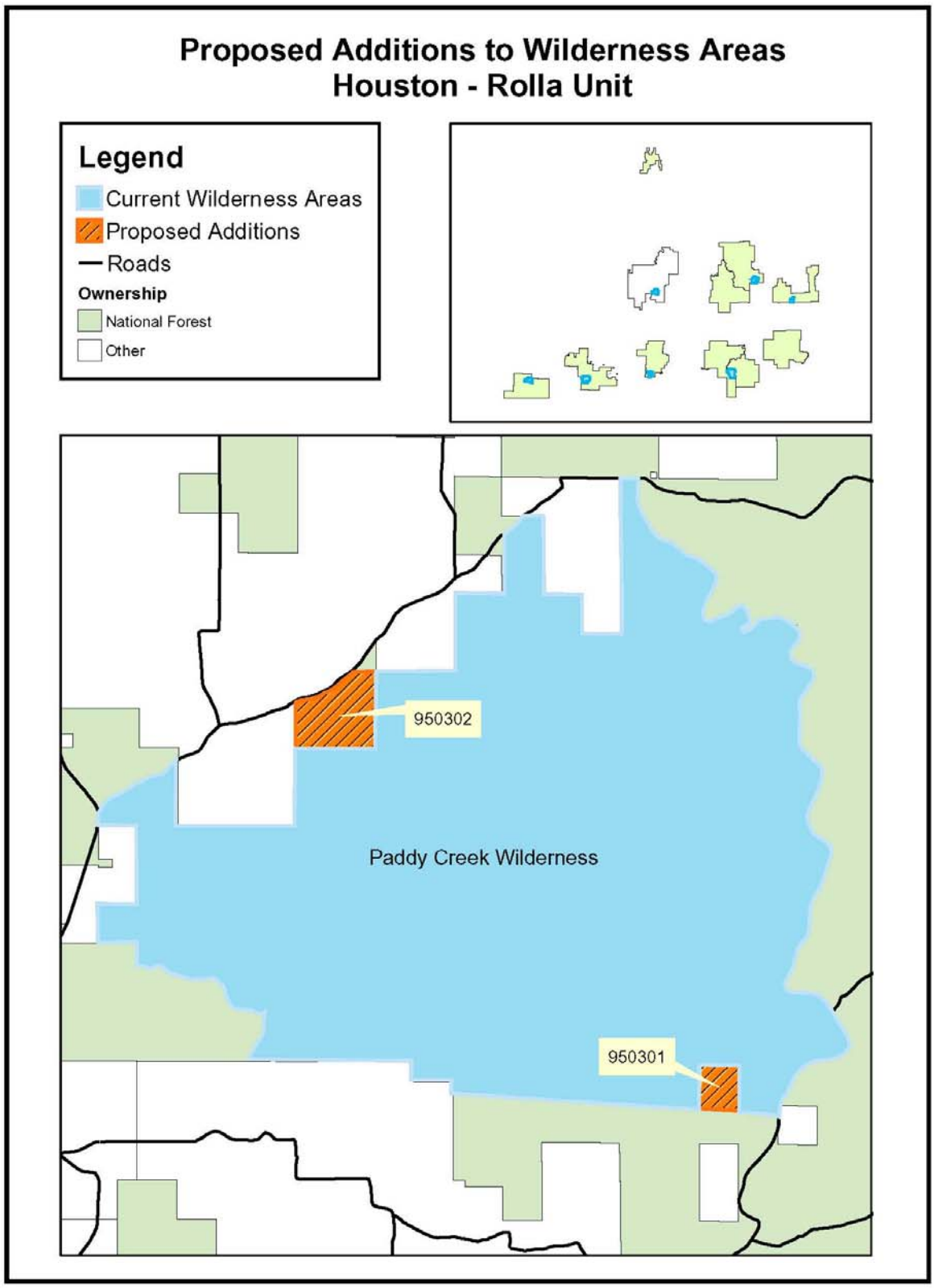
	Alternative				
Roadless Area Name	**1**	**2**	**3**	**4**	**5**
Bell Mountain Additions	Yes	Yes	Yes	Yes	No
Hercules Glades Additions	Yes	Yes	Yes	Yes	No
Irish Excluded Lands	Yes	Yes	Yes	Yes	No
Paddy Creek Additions	Yes	Yes	Yes	Yes	No
Piney Creek Addition	Yes	Yes	Yes	Yes	No
Rock Pile Additions	Yes	Yes	Yes	Yes	No

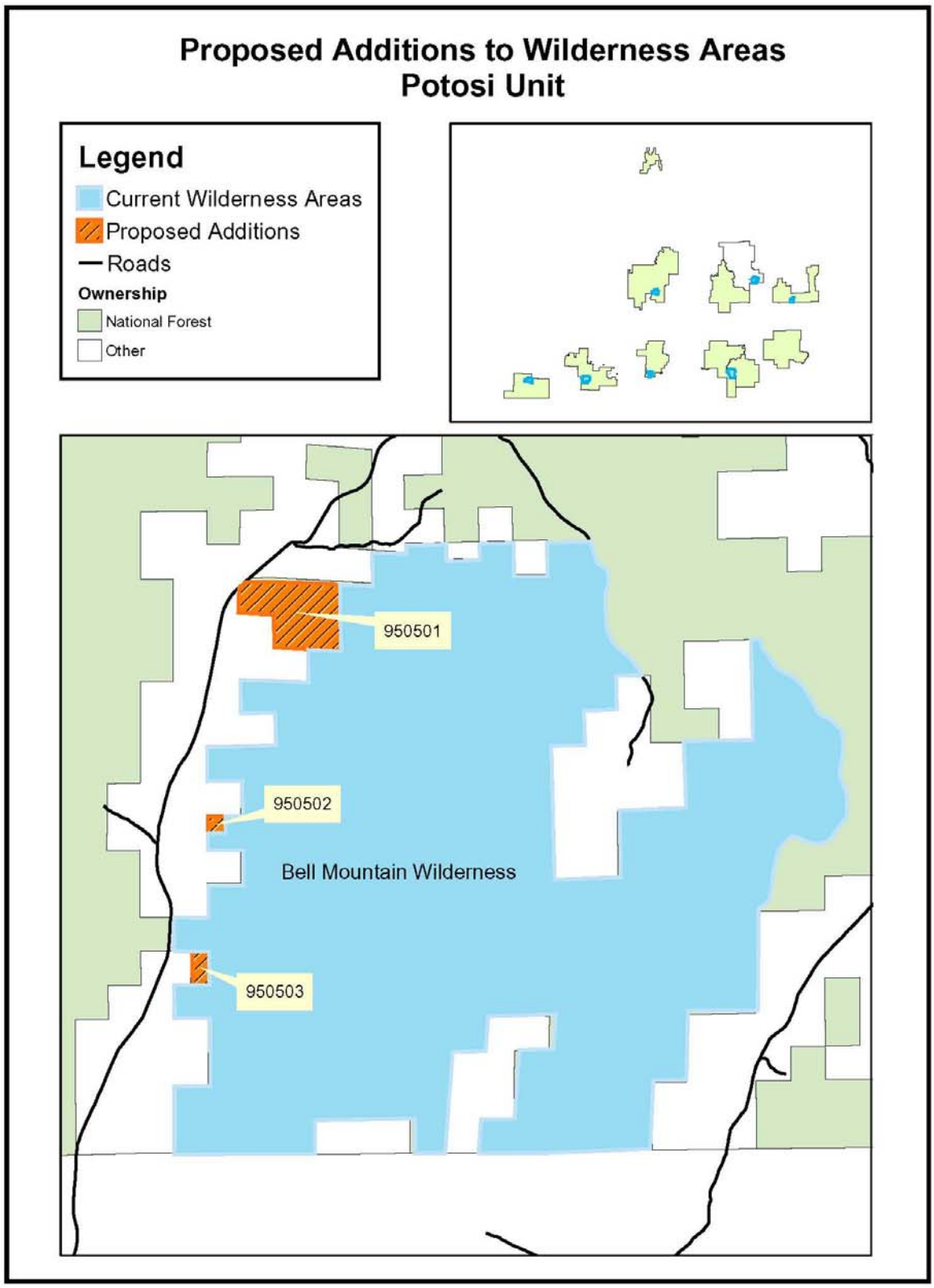

Proposed Additions to Wilderness Areas
Ava Unit
Legend
Current Wilderness Areas
Roads
Ownership
National Forest
Other
Proposed Additions to Wilderness
952103
952101
Hercules Glade Wilderness
952102


Proposed Additions to Wilderness Areas
Cassville Unit
Legend
Current Wilderness Areas
Proposed Additions
Roads
Ownership
National Forest
Other
Piney Creek Wilderness
952104


Proposed Additions to Wilderness Areas
Doniphan - Eleven Point Unit
Legend
Current Wilderness Areas
Proposed Additions
Roads
Ownership
National Forest
Other
952301
952302
Irish Wilderness


Proposed Additions to Wilderness Areas
Fredericktown Unit
Legend
Current Wilderness Areas
Proposed Additions
Roads
Ownership
National Forest
Other
950505
950504
Rock Pile Mountain Wilderness


Proposed Additions to Wilderness Areas
Houston - Rolla Unit
Legend
Current Wilderness Areas
Proposed Additions
Roads
Ownership
National Forest
Other
950302
Paddy Creek Wilderness
950301


Proposed Additions to Wilderness Areas
Potosi Unit
Legend
Current Wilderness Areas
Proposed Additions
Roads
Ownership
National Forest
Other
950501
950502
Bell Mountain Wilderness
950503

Appendix D

Sustainability through Ecosystem Restoration



Mark Twain
National Forest

Cover image: Post oak flatwoods

Photographer: Paul Nelson, Mark Twain National Forest

Appendix D

Sustainability through Ecosystem Restoration

Introduction

The ecosystem approach to management is a strategy for protecting biodiversity and maintaining species viability on the Mark Twain National Forest. The approach to managing for diverse and sustainable natural communities is:

- to restore their structural vegetative condition and maintain historical disturbance processes and functions under which natural communities evolved, and to which they are uniquely adapted.

Ecosystem management is the work of improving the integrity of ecologically distinct areas that contain remaining groups of restorable natural communities (basics of ecosystem management phases are described in Part VI below). The underlying concept is that a representative array of natural communities will include appropriate variations in habitat structure and plant species composition to accommodate most plant and animal species. Conserving an adequate representation of natural communities that harbor a broad diversity of plants and animals is an efficient approach to conserving biodiversity, which may protect the vast majority of all species (Hunter 1991, Groves 2003, Nigh 1992, Noss and Cooperrider 1994). In essence, ecosystem management is a proactive approach to prevent creation of threatened species rather than expend resources attempting to recover them (Hunter 1991).

The purpose of this section is to outline the ecological framework for programmatic decisions made and environmental consequences discussed in the FEIS. Six key components and questions that illustrate ecosystem-level analysis (presented in the Ecosystem Sustainability section of Chapter 3) are:

1. Identifying conservation targets: species and natural communities at risk.
   - What should be sustainable?
2. Developing an ecological hierarchal classification.
   - How do we organize biodiversity in a way we can compare and understand?
3. Establishing a reference range of natural variability for natural communities.
   - How did ecosystems and their associated plants and animals evolve and adapt?
4. Linking species viability assessment to ecosystem function and risk factors.
   - Why is ecosystem function and integrity important to species at risk? What are ecosystem dysfunctions?
5. Determining the spatial configuration of targets.
   - How can we most efficiently and effectively conserve biodiversity and address species viability? What and where are priority conservation opportunity areas?
6. Finally, outlining ecosystem management principles.

- How do we restore natural communities (implementation) and what are the measurable ecological indicators (monitoring) that tell us we are moving in the right direction?

The following documents and initiatives address these steps:

- Ozark Ecoregional Conservation Assessment (Ozark Ecoregional Assessment Team 2003)
- Atlas of Missouri Ecoregions (Nigh and Schroeder 2002)
- The Terrestrial Natural Communities of Missouri (Nelson 2005)
- The Missouri Biodiversity Report (Nigh et al. 1992)
- The Missouri Natural Areas Program
- Partners In Flight; Ozark-Ouachita Physiographic Region
- Ozark-Ouachita Highlands Assessment (USDA 1999)

We begin by referencing The Nature Conservancy's Ozark Ecoregional Conservation Assessment (OECA) that serves as a conservation blueprint, identifying those elements of a region's biological features that are of conservation significance from a biodiversity perspective. Selection of new project management areas for purposes of restoring significant ecosystems should be based on conservation assessments (Groves 2003, Baydack et al. 1999). Significant ecosystems are those distinctive, biologically intact landscapes that have a high probability (with management) of retaining their conservation targets (species and natural communities) over time. The OECA, along with other information provided by Partners in Flight, the Missouri Resources Assessment Partnership and the Missouri Natural Areas System, provides information to determine what is the least area of landscape needed to ensure sustainable conservation of this biodiversity (Ozark Ecoregional Assessment Team 2003). These dynamic landscapes have desired conditions specifically described in The Terrestrial Natural Communities of Missouri (Nelson 2005). Desired conditions are land or resource conditions that are expected to result if planning goals and objectives are achieved. For purposes of restoring ecosystems, desired conditions are described as key natural community elements or outcomes.

Opportunity areas become evident when conservation targets are identified, desired ecological conditions described, implementation methods outlined, and goals and objectives set. Management prescriptions 1.1 and 1.2 were developed in response to the identification of opportunity areas identified by The Nature Conservancy in the OECA report. Objectives result in outcomes (acres treated and moved toward the desired condition) describing what needs to be accomplished to achieve or maintain desired conditions. These targets, desired conditions and opportunity areas reveal options for projects. Management treatments or prescriptions are applied at a rate that trends toward meeting the desired condition over many decades.

To varying degrees, Alternatives 1 thru 4 focus on managing landscapes across Missouri's ecological subsections as a means of representing target natural communities and addressing minimum species viability needs. The alternatives generally use different measures of ecosystem management direction based on themes of each alternative, allocations of management prescription acres and projected activities. Some alternatives may rely more heavily on protected areas, while others put greater emphasis on management that may restore resources to conditions approaching the range of natural variability (RNV).

Part I. Identifying Conservation Targets at Risk

The first question in any conservation assessment is "What is sustainable?" This is answered by listing species, natural communities and ecological systems of distinctive significance from a biodiversity conservation perspective (Ozarks Ecoregional Conservation Team 2003). The Mark Twain National Forest developed a list of plant and animal species of conservation concern by their risk of extinction using a combination of internationally and nationally accepted ranking systems, each designed to assess extinction risk at different scales. The Mark Twain used a 2-step process to identify species-at-risk. The first step is to prioritize and categorize species based on risk. The listing and level of risk categories are as follows:

- Rangewide/national imperilment. Species listed by the U.S. Fish and Wildlife Service (USF&WS) as threatened or endangered, or are proposed for such listing. These are species for which the Forest Service is required to conduct Biological Assessments.
- USFWS candidate species and those ranked by the Natural Heritage Programs, including The Nature Conservancy list with global ranks of G1-G2.
- State and regional imperilment. Species listed by the Missouri Department of Conservation as state endangered, Missouri Species of Conservation Concern, Partners in Flight and examination of S1-S2 species.
- Regional Forester Sensitive Species (RFSS) may be at risk of extirpation at the planning level. These species are of concern in order to meet the requirement of maintaining species viability and distribution of all species within the planning area. The Mark Twain National Forest had 127 species on the RFSS list in 2004.
- Birds of conservation concern. USFWS has identified species, subspecies, and populations of all migratory non-game birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973.

The second step is review of this list to determine 1) if any species on the list is clearly secure within the planning area and therefore does not require further formal consideration, and 2) if there are additional species not on the list that are locally at risk that should be considered in detail in the Plan.

Next, the Mark Twain relied on information from the Ozarks Ecoregional Conservation Assessment, the Ozark-Ouachita Highlands Assessment, the Missouri Natural Heritage Database, Partners in Flight and The Terrestrial Natural Communities of Missouri to identify globally threatened ecosystem targets. These underrepresented natural communities are consistent with need for change issues relating to fire-adapted natural communities and in providing a wide diversity of wildlife habitats. The existing plan tends to focus on strictly structural timber age-class characteristics and does not provide for fire-adapted ecosystem characteristics.

Part II. Developing a Hierarchy of Ecological Units

Classification hierarchies provide structure for analysis of the parts and for synthesis of ecosystems as a whole. It answers the question "How do we organize natural resources or biodiversity in a way we can compare and understand?" Classification is useful for observing and comparing ecological elements in their context, and for understanding interdependence and interrelationships. Classification structure helps characterize ecosystems and identify patterns and processes at different ecological scales. Landscape delineation (the mapping or description of distinguishable ecological units at some scale) is essential in describing and

characterizing Missouri's distinctive, recognizable ecosystems. The hierarchy concept allows us to define components of an ecosystem and their links between different scales of ecological organization. This systematic hierarchical approach, coupled with existing conservation assessments, offers a means for establishing the context of species viability, biodiversity and determining management objectives.

Spatial scale is determined using a hierarchical structure of landscape units based in part on the National Hierarchy of Ecological Units (Cleland et al. 1997). This approach consists of a series of levels in which areas, ranging from subcontinent to local vegetation are grouped based on similarities in climate, geology, soils, glacial history and vegetation. The actual ecological units for the Mark Twain are displayed in Table 1. The levels of domain, division and province are explained in Cleland et al. (1997) while sections and subsections are detailed in Nigh and Schroeder (2002).

Ecological units provide information for natural resource planning, management and analysis, which will assist in the comparison of the range of natural variability with current conditions. Ecological units can be described, mapped or modeled as natural communities and/or ecological landtypes.

The hierarchical framework of ecological units being used by the Mark Twain National Forest (Table 1) incorporates the national framework (Cleland et al. 1997), Missouri's ecological sections and subsections (Nigh and Schroeder 2002) and terrestrial natural communities (Nelson 2005).

Table 1 - Hierarchical Framework of Ecological Units Used by Mark Twain National Forest

Planning and Analysis Scale	Ecological unit	Purpose, objectives and general use	General size and range
Global, continental	Domain, Division	Broad application to conservation assessments	1,000,000s to 10,000s of sq miles
Regional	Province	Assessment of dominant potential natural vegetation	10,000 sq miles
Subregion (within and adjacent to Missouri)	Section	Statewide planning, multi-agency analysis	1,000 sq miles
Subregion (within Missouri)	Subsection	Mark Twain National Forest plan analysis, setting resource management objectives, resource characterization	1,000s to 100s of sq miles
Landscape	Subtypes of Landtype associations	Forest or area-wide project planning	100s of sq miles
Land unit	Ecological Land Type (ELT)	Forest or area-wide project planning at the stand level (may be remodeled)	100s of sq miles
Land unit	Natural Communities	Desired condition descriptions and objective targets	1,000s to less than 10 acres

Domain

Domains are sub continental with similar climates. All of Missouri lies within the Humid Temperate Domain.

Divisions

Divisions are determined by isolating areas of different vegetation and life forms, broad soil categories and regional climates. The majority of the Mark Twain occurs within the Hot Continental Division, with a small portion (Cedar Creek) situated in the Prairie Division.

Provinces

Provinces are determined by broad vegetation regions that are controlled by length and timing of dry seasons and duration of cold temperatures. The Ozark Broadleaf Forest Province encompasses most of the Mark Twain in the Ozarks while Cedar Creek occurs in the Prairie Parkland Province.

Sections

The Ozark Broadleaf Forest Province in Missouri is wholly occupied by the Ozark Highlands Section while Cedar Creek occurs in the Central Dissected Till Plains Section. Sections are areas of similar geographic origin, geomorphic process, rock formations, drainage networks, topographic similarities and climate.

Ozark Highlands Section

The Ozark Highlands Section is a geologically, ecologically and culturally distinct area of North America. Historically, the region was a diverse blend of forests, woodlands, savannas, glades, wetland, caves, riparian and aquatic natural communities. High levels of geologic, soil, topographic and hydrologic diversity results in a wide range of habitat types. These habitats and natural communities are home to more than 5,000 species of plants and at least 20,000 species of animals. These species occur in 85 terrestrial natural communities (Nelson 2005) and 67 aquatic faunal communities (Pflieger 1989). More than 160 endemic plant and animal species are documented from the Ozark Highlands Section (Ozark Ecoregional Assessment Team 2003).

Subsections

The Ozark Highlands Section is divided into sixteen subsections. Subsections are distinguished by differences in topography, relief, the relative occurrence and patterns of natural communities, geology and hydrology. These differences often have characteristic plant and animal species ranges, many natural communities and social/economic land use patterns. The 1.5 million acres of public lands making up the Mark Twain National Forest are widely distributed across Missouri's ecological units with portions of the Mark Twain touching or including 10 of 16 subsections within the Ozark Highlands Section and portions of the Claypan Till Plains Subsection, Central Dissected Till Plains Section north of the Missouri River (Table 2). Ten subsections occurring on the Mark Twain are described in detail in Nigh and Schroeder 2002. Because the Forest Plan is programmatic, objectives for projected management treatments are set at the subsection level for specific target natural communities.

Table 2 - Ecological Subsection Delineations for Mark Twain National Forest Lands

	Total acreage	Acres on NFS Lands	% on NFS Lands	% of total NFS Lands	Ranger Districts
Ozarks Highlands Section					
Black River Ozark Border Subsection	682,000	133,200	20%	9%	Poplar Bluff
St. Francois Knobs and Basins Subsection	1,283,500	97,200	8%	6%	Potosi, Fredericktown
Current River Hills Subsection	3,826,900	508,600	13%	34%	Salem, Doniphan/ Eleven Point
Central Plateau Subsection	7,011,300	73,400	1%	5%	Salem, Doniphan/ Eleven Point, Willow Springs, Houston/Rolla
White River Hills Subsection	4,599,700	309,700	7%	20%	Ava/Cassville/ Willow Springs
Gasconade River Hills Subsection	2,290,600	172,400	8%	12%	Houston/Rolla
Meramec River Hills Subsection	1,830,000	176,700	10%	12%	Potosi
Outer Ozark Border Subsection	4,544,800	13,400	0.3%	<1%	Cedar Creek
Inner Ozark Border Subsection	2,495,800	8,400	0.3%	<1%	Fredericktown
Central Dissected Till Plains Section					
Claypan Till Plains Subsection	Not available	3,100		<1%	Cedar Creek

Landtype Association Groups

Landtype Associations (LTA's) are ecological landscapes that have recognized local characteristics of topography, geography, soils, ecological processes and natural vegetation. LTA groups are groupings of similar LTA's. There are 25 for the State; 9 for the Ozark Highlands, one additional for Cedar Creek, and one that touches the Poplar Bluff Ranger District. The Forest may apply LTA group characteristics as part of conservation planning and project evaluation/implementation.

Terrestrial Natural Communities

Technical experts representing the Mark Twain National Forest, Missouri Department of Conservation, Missouri Department of Natural Resources, The Nature Conservancy and National Park Service served on a workgroup beginning in 1997 to revise and update the Terrestrial Natural Communities of Missouri classification system. This revised system includes in-depth descriptions for 85 terrestrial natural communities in which at least 65 (Table 3) occur on the Mark Twain. The 1986 Forest Plan cross-references terrestrial natural communities and ecological landtypes. The present assignment of ELT's to stand layers is obsolete and in need of updating.

Table 3 - Primary Natural Community Types for Mark Twain National Forest

Natural Community Type	# of natural communities*	Estimated statewide historic acreage	# of natural communities on MTNF	Equivalent historic vegetation**	Percent canopy cover**
Forest	15	13 million	14	Forest	> 80%
Woodland	18	11 million	13	Open Woodland	20-50%
				Closed Woodland	50-90%
Savanna	6	6.5 million	3	Barrens/shrubland	< 20%
Prairie	12	13 million	2	Prairie	Per surveyor maps
Glade	5	500,000	4	Not analyzed	NA
Cliff/Talus	9	No estimate	9	Not analyzed	NA
Stream Edge	3	No estimate	2	Not analyzed	NA
Wetland	13	4.8 million	9	Not analyzed	NA
Cave	2	5,800 sites	2	Not analyzed	NA

**Detailed in Nelson 2005.*

***Equivalent historic vegetation refers to the range of canopy openness analyzed by the Geographic Resource Center (GRC), University of Missouri in 2004.*

A synopsis of the characteristic ecological systems is given in the Ozarks Ecoregional Conservation Assessment (TNC 2003) and Nigh and Schroeder (2002). These natural community descriptions were used to set objectives for treatment of respective natural communities during the next decade (see MP 1.1 and 1.2 objectives).

Part III. Reference Range of Natural Variability

The range of natural variability (RNV) is a term used to reference the variation in physical and biological conditions within an area as influenced by climate and disturbances regimes as they occurred prior to European settlement (early 1800s) (Swamson et al. 1994). RNV is useful in describing and comparing current conditions of the Mark Twain NF to those of the past. Ecosystems, or natural communities, are described in terms of composition, structure, physical characteristics and function (disturbance processes, animal interactions, predation, etc). Ecosystems are dynamic and these attributes are constantly changing. However, composition, structure and function are constrained within the limits of how historical fires, floods, animals and even indigenous people (prior to European settlement) interacted. Sustainable management uses historical information as a reference for restoring and maintaining patterns and processes characteristic of the historical landscape. Studying RNV gives some indication of the sustainability of ecosystems and identifies those components that may need management attention, especially fire-adapted natural communities.

The assemblages of plants and animals that occurred at or prior to European settlement are the benchmark from which to measure today's array of threatened and endangered species. Based on a study of the nation's 1,880 imperiled plant and animal species, habitat destruction and degradation rank as the most pervasive threats to biodiversity in the United States, affecting 85 percent of species analyzed (Wilcover and Rothstein et al. 2000). Early botanists, biologists and naturalists described and documented the abundance, patterns and scales of plants and wildlife during the settlement period, and their subsequent destruction/extinction. Beginning in the early 1970's, ecologists and biologists were trained to systematically assess ecological health across the landscape by conducting a series of natural features inventories. These comprehensive county inventories (some 20 listed in Nelson 2005) identified areas of remaining biological integrity by ranking ecological health.

These inventories and subsequent conservation assessments describe the degree to which plant and animal species, and terrestrial/aquatic habitats are today threatened.

For clarification, emulating natural disturbance processes is about balancing the severity, scale and frequency of disturbance processes with the management-assisted recovery of ecosystem conditions, and their subsequent sustainable use. The current condition for most of the Ozark Highland ecosystems is much different when compared to the historic condition. It is a goal of the Mark Twain National Forest and mission of the U.S. Forest Service to provide forest products to meet society's demands for renewable resources in a manner that sustains resources. Emulating natural processes means conducting management activities (timber harvest, grazing, etc) in ways that best mimic or balance the presumed historic extent of natural communities (see Forest Research Information Paper No. 149; Emulating Natural Forest Landscape Disturbances: Concepts and Applications (2002).

Assumptions and Limitations of RNV

RNV is determined by studying the ecological history of an area. A description of RNV is limited by the availability of information on past landscapes and a means of cross-referencing current data to it. Missouri is fortunate to have data/information derived from historic land survey records and many fire history studies. Assumptions and limitations include:

- Species are adapted to certain historical environmental conditions, can tolerate and may even require a range of disturbances to sustain viable populations.
- Many Missouri natural communities are fire-adapted and dependent on fire to maintain their attributes.
- Missouri's climate has remained relatively stable for at least 4,000 years (see Wettstaed in Nelson 2005 for a brief discussion on climate during the Holocene).
- Native Americans maintained widespread expanses of prairie and savanna, and freed up much of the forest from underbrush prior to and at the time of settlement (Pyne 1982 and others). Their role and impacts on RNV is discussed in Nelson (2004).
- Without active management to maintain RNV for these fire-adapted natural communities, species of conservation concern and sensitive species may decline.
- Precise RNV descriptions for local areas of the Mark Twain NF are obscured by 150 years of vegetation change resulting from resource exploitation during initial stages of European settlement. However, over 30 years of comprehensive natural features inventories have led to classification, characterization and location of benchmark quality natural areas depicting the RNV for ecosystem characteristics.
- Projections regarding the movement of current condition toward RNV are based on quantitative and qualitative plant and animal studies, and vegetation monitoring of the restoration and management of target natural communities in natural areas, conservation areas, state parks, national parks and portions of Forest Service lands.

Historic Vegetation

An historical reconstruction of vegetation structure and disturbance regimes informs us about what is possible within certain locations and times, and places current conditions into this context. This provides insights into major disruptive changes that have altered Missouri ecosystems, and what management is essential in recovering them.

In this context, the methods used to compare historic conditions to present ones provides a broad assessment of land conditions for developing programmatic objectives. As part of the

analysis, the Mark Twain used GIS databases of historic vegetation coverage, and map products for respective ranger districts. Showing percent canopy cover and dominant tree associations helps set desired condition objectives for natural communities within Management Prescriptions 1.1 and 1.2.

The field notes of early land surveys, conducted between 1815 and 1853, are extremely valuable because they include qualitative and quantitative information on cultural and natural environment at times before major impacts of permanent settlement occurred. With a grid cell covering virtually every square mile of the public domain, field survey notes form a systematic collection of reasonably objective information obtainable from no other source. Since 1993, the Geographic Resources Center's Historic Vegetation Project at the University of Missouri has been active in building datasets for test regions of Missouri as well as investigating and testing different methodologies for analyzing and interpreting the data provided by the original notes. The Historic Vegetation Project analyzed land survey records to develop two primary map/spatial data products. Land cover maps are expressions of the relative openness of vegetation that correlate with broad natural community type descriptions. Vegetation class cover maps identified and mapped principle vegetation associations, which in turn correlate with the dominant/characteristic tree canopy and other structural vegetation stages described for natural communities. The Forest's Combined Data System (CDS) data was compared to the Historic Vegetation Project data. Present day dominant vegetation cover of shortleaf pine, post oak, white oak, red and black oak and red cedar were chosen in response to the need for change issues. Table 4 shows the total percent of historic vegetation cover for primary vegetation groups in respective ecological subsections.

Table 4 - Historic Vegetation by Subsection on MTNF Lands Only

	Prairie	Savanna (shrub/ barren)	Open Woodland	Closed Woodland	Forest	Total
Subsections of Ozarks Highlands Section						
Black River Ozark Border	0	15,200	38,700	50,800	28,700	133,400
Percent of subsection		11%	29%	38%	22%	
St. Francois Knobs & Basins	0	3,000	25,800	39,200	29,200	97,200
Percent of subsection		3%	27%	40%	30%	
Current River Hills	200	19,900	169,700	249,600	62,700	502,100
Percent of subsection	<0.1%	4%	34%	50%	12%	
Central Plateau	1000.	10,800	28,300	26,100	6,900	72,200
Percent of subsection	1%	15%	40%	36%	9%	
White River Hills	500	29,100	123,300	110,100	46,500	309,500
Percent of subsection	0.3%	9%	40%	36%	15%	
Gasconade River Hills	500	26,400	80,500	55,600	9,300	172,300
Percent of subsection	0.03%	15%	47%	32%	5%	
Meramec River Hills	100	15,400	63,100	63,300	34,900	176,800
Percent of subsection	<0.1%	9%	36%	36%	20%	
Outer Ozark Border	0	500	4,600	5,400	2,800	13,300
Percent of subsection	0%	3%	35%	41%	21%	
Inner Ozark Border	0	300	3,200	3,500	1,400	8,400
Percent of subsection	0%	4%	38%	42%	16%	
Subsections of Central Dissected Till Plains Section						
Claypan Till Plains	100	100	1,300	1,300	300	3,100
Percent of subsection	3%	3%	42%	42%	10%	
Total Acres	1,500	120,700	538,500	612,900	222,700	1,488,300
Percent of NFS Lands	1%	8%	36%	41%	15%	

Source: Geographic Information Center, University of Missouri, Columbia 2004.

Table 5 compares the percentage of current forest types, taken from CDS database, to historic vegetation cover. The left column lists the historic vegetation type, and the other columns show what percent is currently in various forest type groups. For example, 60% of what was historically in pine is now dominated by red or black oak.

Table 5 - Current Condition of Historic Vegetation

	Current Condition based on stand data information						
Historic Vegetation Group	Open lands	Lowland Hardwoods mesic forest	Pine	Post oak	White oak	Red or black oak	Red cedar
Scrub/Barren Prairie	8%	1%	23%	15%	8%	39%	6%
Elm Associations	18%	14%	7%	3%	13%	39%	4%
Pine Associations	1%	1%	33%	2%	8%	60%	<1%
Post oak Associations	7%	1%	15%	13%	8%	50%	1%
White oak Associations	6%	4%	10%	7%	9%	57%	7%
Red oak Associations	13%	5%	4%	10%	14%	38%	16%
Red cedar Associations	0%	0%	0%	0%	0%	0%	100%

Historical Disturbance Regimes: Fire, Climate, Flooding, Animals and Diseases

This information helps describe changes in the modern landscape, and develop alternatives regarding effects on ecosystems and their biological diversity. Fire, wind, tornadoes, rain, snow, ice, hail, floods, drought, lightning, earthquakes and animals were among the many disturbance processes that shaped Missouri's natural communities through the centuries. Each disturbance type had its own range of variability measured in intensity, frequency, duration, scale and timing. This variability influenced composition, structure, distribution and dynamics of natural communities before European settlement. Frequent natural fires and large grazing and browsing animals contributed to complex mosaic patterns of oak savannas, woodlands and tallgrass prairies. Catastrophic fires and tornadoes were severe enough to level forests and woodlands, setting the stage for regeneration of oaks, shortleaf pine, and shrubs. Intense solar radiation and lack of moisture contributed to the formation of dwarf woodlands associated with bluff tops and open glades. Dynamic patterns of vegetation along stream gravel washes and river sandbars responded directly to flooding.

When thought of in human terms, these disturbance events can be destroyers of human values. However, in an ecological context, many of these events shape natural communities and influence evolution and adaptations of plants and animals within them. A forest destroyed in human terms (for lumber, recreation and other values) is renewed in ecological terms to regenerate a forest, recycle nutrients, create habitat diversity and stimulate plant/animal production.

These disturbance processes formed "regimes." Whether a fire regime, flooding regime or tornado regime, each resulted in a total pattern over time and affected vegetation, plant and animal adaptations and their distributions. Managers and researchers often describe each disturbance regime separately, but they are intricately interwoven.

So what were the historic disturbance regimes that shaped natural communities on the Mark Twain National Forest?

Climate

Mid-continental climate strongly influences the distribution of Missouri's terrestrial natural communities, primarily because it sets the stage for many of the disturbance events that shape

them. Certain disturbances, which interact with variable landform characteristics, directly influence distributional patterns, and structure and composition of natural communities.

Missouri's mid-continental location in the western half of the Humid Temperate Domain determines its overall climate regime of four seasons with strong annual cycles of precipitation and temperature. Summers are relatively hot while winters range from mild to bitterly cold. Spring and fall are transition periods when dry cold air masses clash with warm, humid gulf air. Tropical and polar air masses regulate the state's climate at a coarse scale with most precipitation coming from rising moist air along cyclonic fronts.

Three major climate regimes, roughly correlated with geographic regions, characterize our state: the prairie climate, the Ozark climate and the Mississippi Lowlands climate. However, boundaries of these climatic patterns are spread out. Prairie climate is characterized by hot summers and cold winters. Average annual temperatures are 51 to 55 degrees F and mean annual precipitation is 34 to 42 inches. Nearly two-thirds of the precipitation occurs during the growing season, the average length of which is 200 to 210 days. This climate influences the environment of the Cedar Creek unit north of the Missouri River. The Ozark climate, influencing most of the Mark Twain National Forest, has hot summers and moderately cold winters. Average annual temperatures are 54 to 57 degrees F and mean annual precipitation is 42 to 49 inches. At least half of the precipitation occurs during the growing season, which is 210 to 230 days. Hot summers and mild winters characterize the Mississippi Lowlands climate, which primarily affects the Poplar Bluff and southernmost portions of the Doniphan/Eleven Point Ranger Districts. Average annual temperatures are 57 to 59 degrees F; mean annual precipitation is 48 to 51 inches. Precipitation occurs fairly evenly throughout the year. Average length of the growing season is 230 to 250 days.

Weather Disturbances: wind, tornados, ice storms, snow storms, hail storms, lightning

Missouri's climate is marked by dramatic changes in weather. The state is centrally located in the North American continent, a region characterized by mixtures of warm, moist, gulf air; cold, dry, arctic winds; and arid, southwestern desert heat. These air masses collide, causing violent windstorms, heat storms, hail storms, tornados, heavy rain and snow, lightning, blizzards, drought and cold waves. In 1981, the National Oceanic and Atmospheric Administration began publishing a report entitled "Storm Data," the official record of extreme weather in the United States. Precise accounts of Missouri's extreme weather events provide a benchmark from which to study effects on natural communities (Table 6). These records reinforce historical accounts of climatic events and provide strong evidence that climatic events significantly influence vegetation patterns and contribute to habitat heterogeneity.

The following weather events contribute to the variable shape, texture and character of natural communities:

- Severe ice storms occur along with heavy wet snows that break tree limbs and increase ground fuels;
- Solar heating on south- and west-facing slopes increase light intensity, increase evapotranspiration, increase soil temperatures (and freeze-thaw cycles) and dry fuels rapidly;
- Solar shadows on north- and east-facing slopes inhibit evapotranspiration, lessen soil temperatures and slowly dry fuels;
- Rainfall patterns contribute to various flood regimes depending on watershed characteristics;

- Tornadoes flatten forests and woodlands, creating tip-up mounds and high fuel loads; a tornado can affect any one point in Missouri every 5,000 years (Grazulis 2001);
- Drought causes plant mortality;
- Drying winds and low humidity create conditions for spread of fire;
- Lightning damages trees and contributes to wildfires.

Table 6 - Selected Recorded Climatic Extremes and Effects on Natural Communities

Date	Place	Event	Effects
1974	Locust Creek Natural Area, Pershing State Park	Tornado	Leveled extensive areas of old-growth mixed bottomland forest resulting in an impenetrable growth of vines
June 1980	Meramec Upland Forest Natural Area, Meramec State Park	Thunderstorm squall with winds in excess of 100 mph	Effected extensive areas of old-growth woodland and forest canopy, leaving sheered trees, tip-up mounds and large canopy openings.
July-August 1980	Johnson's Shut-Ins Natural Area, Johnson's Shut-Ins State Park	Heat storm	Extended drought and 100 + degree F temperatures damaged or killed woody vegetation on igneous glades.
1982	Coonville Creek Natural Area, St. Francois State Park	Wet snow 25-30 inches	Sheered and toppled trees, especially red cedar
October 16, 1983	Niawathe Prairie Natural Area	Hailstorm	Hail pulverized and flattened prairie vegetation; recorded animal deaths included 16 prairie chickens, one marsh hawk, hundreds of small birds and rodents.
February 1984	Van Meter Forest Natural Area, Van Meter State Park	Ice storm	One inch of ice coated trees and herbaceous vegetation causing severe limb breakage, often down to the trunk.
Summer 1993	Missouri River valley	Flood	Heavy prolonged rainfall resulted in record bluff-to-bluff flooding lasting for 30 days and scouring new chutes, blueholes and depositing many feet of sand and silt. Resulted in set aside wildlife refuges.
April 2002	Poplar Bluff Ranger District, Mark Twain National Forest	Tornado	F-3 tornado leveled more than 7,000 acres of mixed pine and oak woodland resulting in many tip-up mounds.

Source: Nelson 2005

Small Gap Wind Disturbance

Canopy gaps occur when strong downdraft winds associated with thunderstorms or strong storms break off large branches or treetops. These events also cause blowdowns with corresponding tip up mounds, especially in older age class stands. One Missouri study shows that thunderstorm or high wind blowdowns create small forest/woodland canopy gap patches that disturb over 1% of the landscape per year (Rebertus 2001). This is consistent with results of other wind gap analysis for the Midwest (USDA 2004). Severe ice storms also contributed to breakage of tree limbs and increased ground fuels (Rebertus et. al 1997).

There appears to be a correlation between limb breakage or tree damage severity and the age of trees. Younger, less brittle and more pliable trunks are less susceptible to breakage. Given this, the relative average age class distribution across the Mark Twain National Forest determines what areas are more prone to creating diverse habitat associated with gaps created by blowdowns or ice storms. The lower mean average age of the forest as a whole, the more

uniform the stand. This has implications in providing a heterogeneous stand structure for wildlife, sun-loving herbs and regeneration.

Catastrophic Wind Disturbance: tornados and severe thunderstorms

Tornadoes flatten forests and woodlands, creating tip-up mounds and high fuel loads. We have no methods for confirming the return interval for how often and to what extent tornados and severe thunderstorms repeatedly occur through time and space. This may be important from the standpoint that these events, coupled with all other events, might limit the age class distribution of old growth trees to a certain percentage of total forest/woodland cover. Many examples occur in which old growth timber suffers severe damage from tornados and catastrophic windstorms. Many old growth stands remaining in Missouri appear to consist of even-age classes suggesting that historical catastrophic events remove large portions of stands.

Fire

Fire was a profound shaper of Missouri's natural communities. Evidence is present in historical accounts, aboriginal burning, fire scars, lightning ignitions, adaptations of plants and animals, fire modeling, understanding the nature of natural fuels and response to applied management.

Many early explorers in Missouri chronicled numerous accounts of periodic fires. Ladd (1991), Nigh (1992) and McCarty (1998) are sources of information specific to the history and presence of fire in Missouri. Add to this the overwhelming, universal and pervasive evidence for historic fires as presented in many other documents across North America (Williams 2000, Nowacki 2002, Wettstaed previously stated) and it becomes clear that the influence of fire is the primary explanation for the observed presence of otherwise fire-dependent natural communities distributed across the Missouri landscape.

Fire scars provide valuable records in establishing fire regimes. Guyette and others reconstructed fire histories by tree-ring analysis of red cedar and post oak for various regions of the Ozarks (Guyette and McGinnes 1982, Guyette 1989, Guyette and Cutter 1991, and Guyette and Dey 1997). Their results showed evidence of frequent fires occurring during the last 500 years in the Ozarks, with intervals generally ranging from 3.2 to 35 years, depending on the study area. Guyette conducted several fire history studies specifically on the Mark Twain NF. Historical records indicate that most fires occurred in fall with less frequent fires occurring in spring, and a few taking place in winter or summer. Studies indicate that the historical, widespread presence of shortleaf pine-dominated natural communities in the Ozarks was regulated by historical fire (Stambaugh 2001, Batek et al.1999).

Nearly 25 years of prescribed burning across Missouri to restore savannas, open woodlands, glades, prairies and wetlands have revealed that many plant species and natural communities are adapted to or dependent upon fire. Missouri's present-day precipitation and sub-humid climate, in the absence of fire, favor advancement of woody vegetation, especially in damaged and degraded ecosystems. Without fire, woody vegetation will encroach into prairies, savannas and open woodlands. Both shade and accumulating deep leaf litter smother and reduce or eliminate otherwise sun-loving flora and associated fauna (McCarty and Hassien 1984). Vegetation monitoring also shows that species density and richness improves following prescribed burning.

Modeling fire behavior involves conducting intensive calculations using data collected on fuels, weather and topography. Fire behavior is largely dictated by local topography. In general, fire spreads more quickly and intensely on flat ground. In contrast, fires spread more

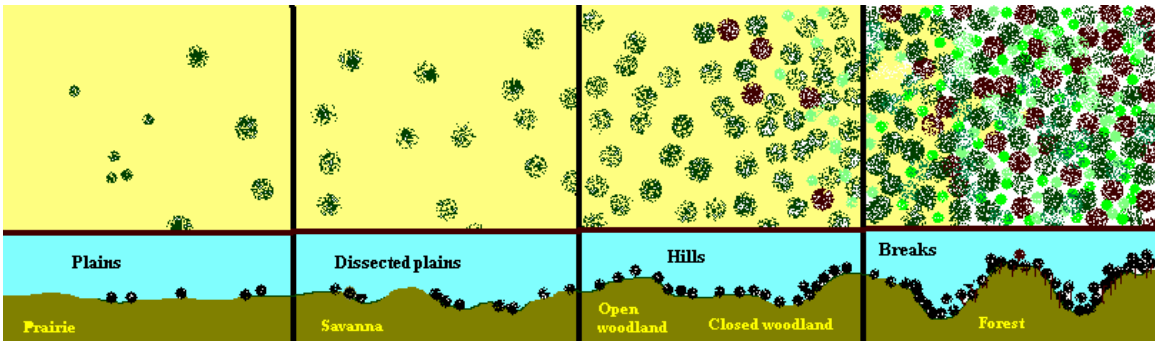
slowly and with relatively less intensity over steeper lands often broken by streams and rivers (Guyette et al. 2002; Swanson et al. 1994). Fires often creep slowly or burn less intensely on north-facing steep slopes. This shows a strong correlation between prairies and savannas occurring on level lands resulting from more frequent and widespread fires. Mesic forests occur in deeply dissected landscapes on shaded, steep north- and east-facing slopes. Landscapes broken by wetlands, swamps and/or the fire-shadows along major streams and rivers also suppress fires.

Prior to European settlement, the widespread presence of grass/forb-dominated natural communities created a more flammable landscape. Fuel type often determines how fires behave. Fuels associated with high quality prairie, woodland and savanna natural communities are prone to drying quickly and burning efficiently. These fires are low intensity, but flashy and spread rapidly. More than 100 years of livestock grazing has changed or altered the condition of this once widespread fuel type; deciduous leaf litter now dominates. Now shaded by a densely overstocked canopy, compacted leaf litter takes more days to dry. Despite changes in the historical fire regime, present-day wildfires occur with great frequency from a variety of ignition sources. For example, over 6,295 wildfires are recorded on the Mark Twain National Forest between 1954 and 2003. This does not include many more thousands of wildfires reported to the Missouri Department of Conservation, other local fire departments and those that go unreported.

Fire by Natural Community Type

How fire burns is a function of the fuel, topography and weather. Fire ecologists call this the fire environment. Certain fire behavior patterns characterize a locale or region; if the incidence of fire remains the same for a broad region, the fire regime will vary for different locations within it. Different terrain, aspects, slope positions, soil moisture characteristics, and vegetation patterns create vastly different fire environments. On the landscape scale, high prairie plains of the Ozarks prior to European settlement were well exposed to sun and wind. Their fuels dried quickly, there were few barriers to fire spread, and vegetation was highly flammable. Fires were frequent, burning fast and hot across long spaces. However, off to the sides of all these prairie plains lay river valleys with dissected hills and many north- or east-facing slopes leading down to them. They were covered in woodlands that were more sheltered and shaded, had lower average temperatures and wind speeds, higher average humidity and fuel moisture, a much less flashy fuel and multiple barriers to fire spread. Understanding the fire environment becomes important in Plan analysis because when and where fire is applied on the Mark Twain for purposes of restoring natural communities becomes a function of understanding local area fire history and the presence of natural community indicators. Likewise, behavior of fire upon the landscape is likely the best explanation for why certain natural communities were historically distributed in distinctive patterns across the Ozarks in relationship to vegetation and topography (Figure 1)

Figure 1 - Relative Canopy Openess Breaking Points for Major Natural Community Types



This diagram suggests relative canopy openness breaking points for major natural community types within the historic range of natural variability. The top boxes show aerial view while the bottom represents a horizontal cross section profile of landforms associated with changes in vegetation. Canopy openness and landform appear related to the historical fire regime. Prairie and savanna occur on relatively level to gently undulating topography while woodland and forest are strongly associated with hills and breaks respectively (Nelson 2005).

Determining fire effects and regimes for all the various permutations of landscapes across the Forest will be evaluated at local, project level Plan implementation. In general, the historic fire regime for the Missouri Ozarks was one of frequent light surface grass/forb fires occurring as often as each year for prairies to as infrequently as 25 years or more in forests for portions of the deeply dissected breaks (Guyette and Dey 2000). These were likely combined with sporadic small scale, long interval stand-replacing fires or high intensity surface fires. Patterns of modeled historic vegetation cover and canopy openness suggest that large patches measuring in the hundreds to thousands of acres were subject to more intense fires that limited tree growth but favored oak/pine and shrub regeneration (oak thickets and barrens) prior to European settlement (Schroeder 1981).

Table 7 - Estimated of Fire Frequency by Natural Community Type

Natural community type	Landform	Restoration Fire Frequency	Maintenance Fire Frequency
Prairie	Broad level plains	1-3 years	2-4 years
Savanna	Rolling plains	1-4 years (lower intensity	3-5 years
Open woodland	Dissected plains and hills	1-3 years	3-7 years
Closed woodland	Hilly	2-3 years	3-10 years
Forest	Hills and breaks	5-25 years*	10-25 years
Glade	Dissected plains and hills	2-3 years	4-10 years
Fen	Hills, breaks, floodplains	1-3 years	2-6 years
Riparian zones	Bottomland floodplains	3-10 years*	5-15+ years

**Due to their relatively poor ecological condition or lack of experience, these figures are approximations only and need further research.*

Estimates of restoration fire frequency intervals are extrapolated and inferred using information from known fire studies and applied fire frequency/interval responses using prescribed burning to restore fire-adapted natural communities. Desired conditions for glades, savannas, open and closed woodlands, expressed in restoration of structure and ground cover flora, were achieved by applying prescribed burning at select yearly intervals. State and

federal agencies and non-profit private conservation organizations including The Nature Conservancy and Missouri Prairie Foundation have now applied prescribed burning in the restoration of fire-adapted natural communities for at least 25 years.

Maintenance fire frequency is shown for comparison. Most areas subject to ecosystem restoration activities have not reached stable age class structure, vegetation pattern diversity, and high species richness for groundcover flora. This is also analogous to Condition Class I fuels and often takes at least 25 to 30 years to achieve.

Water and Flooding

Water is a primary force critical to shaping natural communities. Both flooding and precipitation absorbed into the water table on the Ozark karst landscape played a major role in stream system functioning and the availability of groundwater and spring flows. Historically, healthy soils played a major role in storing and releasing precipitation into streams and the water table. Missouri's emerald springs and crystal-clear Ozark streams inspire us. People watch as a barge transports goods on the Missouri or Mississippi River, or fish one of many artificial ponds and lakes. Despite these pleasures, most people are unaware of how water functioned in the formation of rivers, springs, streams, groundwater and vibrant wetlands 200 years ago. Today's flooding patterns, spring flows, and the ability of soil and vegetation to hold moisture is dramatically different from the time when Meriwether Lewis and William Clark, Henri Brackenridge and Henry Rowe Schoolcraft first described Missouri's water resources in the early 1800s.

How water influences today's natural communities is perhaps best understood in the context of its historical role. Historical accounts and present-day studies of high quality watersheds all seem to share similar characteristics. How water is accepted in the hydrological cycle depends on the frequency, duration, seasonality and intensity of precipitation events, interactions and ecological health of the local landscape and vegetation, and climatic conditions.

The Ozark Highlands boasts the largest concentration of springs in the United States. Springs, sinkholes and losing streams are features of an ancient uplifted plateau underlain by porous limestone and dolomite rock fractured by millennia of uplifts. Despite the rugged, steep Ozark landscape, much of the 40 to 45 inches of annual rainfall percolates down through porous chert rock residuum, drains internally through sinkhole basins, or is captured by soil and vegetation cover.

Characteristics of spring flows and quality of water chemistry are primarily a function of the ability of the land surface to capture rainwater. The historic condition of natural vegetation cover and ability of intact soils to absorb moisture are critical to flow characteristics of nearby springs. Any disturbance to either will adversely affect water infiltration rates, spring flow outputs and stream flows. Additionally, dead woody material in streams once provided stabilization against strong currents, provided habitat for fish, invertebrates and microorganisms, and captured in-stream detritus that stimulated the aquatic food chain. Studies (Dey et al. 2003) show that some dead large trees still remaining submerged in Ozark streams have functioned in this capacity for over 4,000 years.

The current Ozark Highland landscape has changed dramatically since the time that settlers sought small springs for dependable, fresh water sources. Smith (2003) chronicles the loss of once lush, fire-mediated grass and forb cover that mantled the Ozarks at the time of European settlement. With original vegetation stripped away by a century of domestic livestock overgrazing, runoff increases in streams and rivers, and less precipitation filters into the water table to supply aquifers and springs. Many springs went dry (Rafferty 1980, Jacobson and

Primm, 1994). Because of denser second growth flush of woody vegetation now covering the once open Ozark woodlands, a flattened mat of accumulated leaf litter now replaces a lush cover of deep rooted, water-absorbing forbs and grasses. The water-holding capacity of this "new forest" is not like that of the former vegetation.

To what degree that streams and rivers of the Ozarks (particularly those of conservation concern outlined in the OECA) are functioning as natural systems is partly supported in documentation of their historic condition, past and present developments and current use. We know that:

- many aquatic species are in jeopardy,
- watershed quality is declining in some areas,
- physical and chemical conditions of streams and rivers are degraded due to historical logging,
- open-range livestock grazing and clearing of virtually all tillable bottomland natural communities for croplands and grazing has removed most bottomland hardwood forests,
- in-stream woody structure is lacking,
- most streams and rivers suffer sediment overburden and
- banks devoid of quality vegetation cover are scoured and eroded.

Watershed assessments (see website) outline these threats and risks to stream and river water quality and to aquatic organisms resulting from watershed conditions. For the most part, the Mark Twain NF does not own or control the majority of watershed acreage for those major Ozark streams and rivers traversing or dissecting its lands. Most land use affecting water quality and aquatic flora and fauna is beyond control of the Mark Twain.

Animal Disturbances

Before European settlement, great numbers of American bison, elk and white-tailed deer roamed freely throughout Missouri. Houck (1908), Beilmann and Brenner (1951) credit abundance of wildlife at the time of European settlement to intact and highly productive open woodlands covered in seed and fruit-bearing grasses, wildflowers, open-grown oaks and shrubs—all linked to the replenishing influence of fire. Beaver inhabited most waterways, felling trees on their banks and creating natural dams and wetlands. The roosting activities of now-extinct passenger pigeons may have caused widespread breakage of tree limbs, tree mortality creating canopy gaps, fuel accumulations that could have increased fire intensity and possibly maintenance of white oak, bur oak and black oak. Bison, elk, and white-tailed deer, among others, fell prey to the black bear, coyote, mountain lion and gray wolf.

Since that time, humans have greatly altered or eliminated these animal populations through direct harvesting or habitat destruction. Missouri's free-roaming elk and bison are gone. The passenger pigeon, Carolina parakeet and ivory-billed woodpecker are extinct. Habitat fragmentation, roads, fences and competition with exotic species including domestic livestock have altered or eliminated historic migrations of abundant wildlife. While the black bear population is increasing and state conservation officials have confirmed the recent presence of mountain lions, their predatory role in controlling large numbers of white-tailed deer and other prey is currently ineffective. Elimination of large native grazers and large predators, along with imbalances of native and non-native animals constrained by fragmentation is far removed from the historic range of variability.

Part IV. Associating Species at Risk with Natural Communities

More than 700 species of vertebrate animals occur in Missouri, many which are found in the Ozark Highlands. Historical abundance of wildlife and plant species associated with complex, high integrity and diverse patterns of continental-scale natural communities are now endangered; primarily by fragmentation, degradation and disruption of disturbance processes associated with these former ecosystems. We have analyzed species at risk in the context of their associated linkage to natural community/habitat associations and risk/threat factors. Looking at species that share similar risk factors has the advantage of placing species in categories that can be affected by similar management actions. The resulting categories can be used to organize an effects analysis, and to propose particular management alternatives that directly alter the perceived threat. As such, risk factor groupings can provide a framework for development of effective mitigation measures. Presumably, many species in a risk category would respond to the perceived risk in a similar way, facilitating evaluation of effects. However, this assumption will not be universal and some species placed in a common category by risk factor may respond in different ways.

Seral/structural stages as well as natural communities may be used when grouping species by habitat, because the viability of some species may be dependent on a particular stage that is underrepresented or in poor ecological condition. By using seral stages to define species groups, conservation strategies and the analysis of effects can be made more specific. For example, the current list of Regional Forester Sensitive Species contains a grouping of at least ten plant and animal species, along with at least ten more S1 or S2 ranked species, associated with limestone/dolomite glades. One conservation approach for glades on the Forest is to change management area direction to restore and maintain large glade complexes and adjust standards and guides to manage glades. This change would thus accommodate nearly 15% of the RFSS list, and other conservative species associated with glade habitat.

If plant and animal species are selected in this way, we can legitimately defend them as being representative of ecological requirements of a larger group of species, and generally link them to natural communities. However, even where species have very similar ecological requirements, it is not an expectation that their population dynamics would parallel each other. This process requires use of detailed information on species habitat requirements, and that a relatively large and diverse grouping of species was needed to provide insight into requirements of all species.

The Mark Twain National Forest has selected management indicator species that represent other species in healthy ecosystems. For example, the summer tanager is a characteristic species associated with dry, open post oak/white oak and/or shortleaf pine woodlands. Managing to restore and maintain open woodlands through various silvicultural practices and prescribed burning should result in an increase in this species abundance. Along with this increase, other associated plant and animal species at risk grouped with this same natural community should increase or remain stable in abundance. Add to this variable management practices designed to mimic disturbance processes and natural patterns of vegetation, this should create a broad range of variability in structure, age classes, composition, and percent cover that will reproduce similar conditions described for the underrepresented natural community.

It may not be necessary, nor is it practical to have detailed information about all organisms and processes in an ecosystem to develop a management scheme based on maintaining the integrity of systems of natural communities (Hunter 1991). The ecosystem management approach is one employed in management of statewide natural areas, which is moving toward

design of larger natural area designations with the goal of representing areas of distinctive, characteristic landscapes by ecological subsection.

Species-specific management

The viability of some species is only partially addressed through broad direction for management of ecosystems, either because the causes for concern are not related to habitat, or because those approaches do not adequately address certain fine scale habitat components. Fine-scale features such as fens, caves, seeps, spawning sites and raptor nest sites are often essential for viability. The existing Plan standards were examined with regard to species-specific direction for such features and developed to address newly identified habitat needs, non-habitat factors, or supplement broad-scale management as necessary. While species-specific direction should generally be compatible with overall direction, some exceptions are necessary. For example, management activities directed at recovering igneous glade habitat for Mead's milkweed may alone not suffice to stimulate successful seed production. This may require more specific actions (see SVE analysis for Mead's milkweed).

In the context of conducting effects analysis, grouping by degree of risk provides a framework to focus the analysis on those species for which management actions may result in significant consequences -- a significant trend toward extinction or a trend toward recovery. Species in high-risk categories are not likely to have strong ecological similarities, and examining effects of management on one species is unlikely to provide strong insights into the specific effects on other species in the same risk category.

Part V. Conservation Planning

What do we want? How can we most efficiently and effectively conserve biodiversity and address species viability? What and where are priority conservation opportunity areas? Our approach to meeting ecosystem sustainability goals includes planning or priority setting, developing conservation strategies, taking action on the ground, and measuring our success through long-term monitoring. Ecoregional planning addresses fundamental questions in the science of conservation biology and landscape ecology. For example, what group of species, communities, and ecosystems could we "target" to represent all biodiversity? How should we evaluate the ecological "health" or "integrity" of these targets? Can we identify the best places that would secure ecological integrity of the entire ecoregion while allowing for multiple human uses?

The Mark Twain NF shares the common need along our partners to find answers to these questions. Nationwide, the US Forest Service and The Nature Conservancy (TNC) are working together to develop conservation strategies for conserving biodiversity. Likewise, the Mark Twain National Forest is working with the Missouri Chapter of The Nature Conservancy to gather information on conservation areas and discuss the results of the Ozark Ecoregional Conservation Assessment. The analysis is strongly linked to this effort in three ways: first, it allows the Mark Twain to focus conservation planning and management efforts on specific opportunity areas on Forest lands, also known as "portfolio sites", through development of Management Prescriptions 1.1 and 1.2. Second, specific outcomes were developed by discussing results of the OECA. We formulated minimum/maximum viability targets for natural community complexes in MP 1.1 and 1.2 that allowed us to set management activity objectives to move critical ecosystems toward desired conditions.

This approach parallels goals of the Comprehensive Wildlife Strategy (CWS), which is to identify a set of conservation opportunity areas that best represent native species, ecosystems and ecological processes in Missouri's ecoregions. The Forest has provided the Missouri

Department of Conservation with spatial layer coverage for MP 1.1 and 1.2 to add to statewide information gathered from conservation partners during the process.

When we compare current conditions with the range of natural variability, opportunities for what needs work and where show up. The viability process groups species sharing similar habitat characteristics and a range of reference management solutions into categories. These approaches range from maintaining riparian habitat in-stream structures, prescribed burning for fire-adapted natural communities, to protection of specific locations for species at risk.

Part VI. Ecosystem Management Principles

Management Premises

Sustainability is important to land management. Foundational to this are four assumptions (adopted from Manley 1995):

1. Ecosystems adapted over extended time periods provide the best chance for sustainability. For biological systems, this would be systems evolved through evolutionary time.

In this context, the Mark Twain National Forest has adopted the period prior to European settlement as a reference point from which to set desired conditions and compare historical conditions to present ones. This period chronicles evidence that points toward a landscape characterized by essentially unfragmented, high integrity natural communities (Nelson 2005). Missouri's climate has remained relatively stable for 3,000 and 4,000 years (see Wettstaed in Nelson 2005). The creation of large biodiversity landscapes managed to restore mosaics of natural communities in the context of historical natural processes could enable species and natural communities to respond to long-term environmental changes and stresses, such as global warming (Nigh et al. 1992).

2. Our best predictions of ecosystem response to management actions and anticipated disturbance represent a reasonable basis for management planning and projections.

Predictive capabilities of applied management are measured in the successes and failures of respective agencies and organizations employed the past 30 years in restoring and sustaining ecosystems. Many federal and state agencies based in Missouri have pioneered ecosystem restoration efforts and their findings serve as reference benchmarks from which to monitor ecosystem restoration progress.

3. Management designed to maintain or reproduce key ecosystem components, structures and processes is the management approach most likely to sustain ecosystem integrity and productivity.

There appears to be no realistic alternative management method managers can use to duplicate the complex effects of fire for sustaining Missouri's fire-adapted natural communities. This is based on our current understanding of how natural communities function, how post-European settlement has impacted and changed them, and how deviations from the range of natural variability has affected species and ecosystem viability. Most all present indications of risk factors and threats discovered in the species viability process point toward loss of biodiversity caused by ecological degradation and loss of historical disturbance processes.

4. Attention given to the intense efforts of restoring ecosystems in MP 1.1 and 1.2 must not ignore the broader and socially diverse role of other MP's in the conservation scheme.

The new management philosophy and approach for other portions of the Mark Twain National Forest specify that modified desired conditions may lie within or close to the range of natural variability for natural communities. Many plant and animal species of conservation concern, unique special habitats or natural communities lie outside the boundaries of MP 1.1 and 1.2.

Recommended Management Variability

In applying the ecosystem management premise of restoring and maintaining key components to produce quality natural communities, we need to manage environmental indicators within an acceptable range (Manley 1995). A range of natural variability exists for desired conditions and associated historical disturbances regimes including fire, flooding, insects, diseases and weather. Environmental indicators include measures of an element used to describe a natural community. Examples include outbreaks of severe armillaria root rot diseases, infestations of oak wood borers measured in numbers of insects per tree, intensity of wildfires, ice storm damage, siltation and non-native invasive plant species.

While historically, many of these factors were important in the evolution and distribution of ecosystems and their associated flora and fauna, we now have to manage in a more limited range. Today, we cannot manage the Forest in a manner that replicates nature's extremes, especially not those we can control. These include not allowing wildfires to spread under catastrophic drought conditions or insect infestations to damage or kill large portions of timber.

The purpose of this ecosystem management principle is to define an acceptable distribution of conditions that will sustain or enhance natural communities. Certain management activities will vary in effects across the Forest and by the alternatives. Some activities will fall along the margins or outside of the range of natural variability for vegetation across the Forest. Barriers toward the application of Range Natural Variability are recognized for this relatively new management concept (Baydack et al. 1999).

Ecosystem Restoration Programs and Projects

Fortunately for Missouri, all state and federal agencies and private land-managing conservation organizations have participated in one of the Midwest's oldest conservation partnerships, the Missouri Natural Areas Program. Overseen by The Missouri Natural Areas Committee (MONAC), the committee is made up of members from the Missouri Department of Conservation, Missouri Department of Natural Resources, US Forest Service, US Fish and Wildlife Service, National Park Service and The Nature Conservancy. These entities have cooperated in the Natural Areas Program for nearly 30 years to inventory, designate and manage representative examples of Missouri's biological diversity called Natural Areas. MONAC defines natural areas as "biological communities … that preserve and are managed to perpetuate the natural character, diversity and ecological processes of Missouri's native landscapes." This definition is consistent with ecological principles outlined in this discussion.

MONAC relies on the Missouri natural features inventories conducted between 1980 and 2001. These inventories established the data framework from which to not only protect and designate natural areas, but from which to assess the ecological health of natural communities including those on lands owned by the Mark Twain National Forest. Additionally, natural area owners have striven to apply ecosystem restoration practices in efforts to restore ecological health to many natural areas. These natural areas serve as benchmark references for natural communities that are managed within or close to their range of natural variability.

This RNV includes ecological health, recommended management practices, desired condition and species population studies (Bowles 1995, Templeton et al. 2001, Gerber 1996).

Part VII. Fundamentals of Ecosystem Management

How do we restore natural communities and to what time period? Using the pre-European settlement period as a reference point helps us understand the nature of quality, un-fragmented, stable natural communities that dominated millions of uninterrupted square miles across most of North America. Pre-European settlement is the ideal condition against which current altered landscape and composition are evaluated (Noss 1983). Plant and animal species gradually adapted and evolved into complex arrays of natural communities, or ecosystems, subject to thousands of years of disturbance processes. The scale and pattern of these processes, along with a relatively stable climate for the past 4,000 years or more, supported a diverse group of native plant and animal species (Lorimer 2001).

The assemblages of plants and animals that occurred at or prior to European settlement are the benchmark from which to measure today's array of threatened and endangered species. Based on a study of the nation's 1,880 imperiled plant and animal species, habitat destruction and degradation rank as the most pervasive threats to biodiversity in the United States, affecting 85 percent of species analyzed (Wilcove and Rothstein et al.2000). Early botanists, biologists and naturalists described and documented the abundance, patterns and scales of plants and wildlife during the settlement period, and their subsequent destruction/extinction. Beginning in the early 1970's ecologists and biologists were trained to systematically assess ecological health across the landscape by conducting a series of natural features inventories. These comprehensive county inventories (some 25 listed in Nelson 2005) identified areas of remaining biological integrity by ranking ecological health. These inventories and subsequent conservation assessments determine the degree to which plant and animal species, and terrestrial/aquatic habitats are today threatened.

European settlement severely disrupted North American ecosystems, plant and animal populations and historic disturbance processes with unprecedented magnitude and speed. Ladd (1991), Nigh (1992), McCarty (1998) and Yatskievych (1999) documented these effects. These sudden landscape alterations and disruption of historic disturbance processes have produced modern vegetation in structural, successional, and compositional disequilibrium (Eirvin et al. 1998).

When the term pre-European settlement is used in the context of restoring natural communities, or in classifying them, the primary reference is one of understanding what they were and how they functioned before the process of ecosystem degradation began. Ecologists are attempting to study and better understand effects of various management alternatives in the context of chronological rates of change in ecosystems. This comprehensive history of change in land use helps us identify the natural range of variability, which allows resource managers and administrators to make more informed decisions (Sisk 2004).

How do we manage ecosystems?

Ecosystem management is complex and challenging. Detailed natural community assessments, diagnoses and prescriptions are left to project planning and implementation guides. Prescriptions vary in complexity and intensity based upon existing ecological health, landscape design and available resources of a particular area. Many Midwestern States share similar management approaches toward restoring healthier natural communities (see Packard and Mutel 1999; Nelson 2005). These approaches begin with a classification system that

describes distinctive natural communities, their range of vegetation variability, characteristic plants and animals, and those natural and human-caused processes by which they evolved.

Ecosystem management is the work of improving ecological quality of a given area in context of its historical condition. Ecosystem management can be divided into separate phases relative to forest management activities. These phases assume that distinctive natural communities are described (Nelson 2005) based on their historical occurrence and high quality characteristics. In that context, most of Missouri's unique ecosystems were relatively stable and highly diverse, and they possessed measurable characteristics in terms of vegetation structure, species composition and abundance, functional relationships, physical characteristics, and a range of disturbance processes. Understanding what these ecosystems were, where they occurred in relationship to different landscapes, and their current condition is critical in implementing ecosystem management. Comprehensive reports on statewide natural features inventories and data maintained in the Natural Heritage Inventory database (MDC) provide an assessment of ecological conditions for Missouri's landscape, including lands on the Mark Twain National Forest.

Types of Ecosystem Management

Restoration

Ecosystem restoration, sometimes called rehabilitation, needs to occur when natural vegetation exhibits the ability to achieve a given desired condition. It is the repair or re-establishment of natural community complexes. Diagnosis of ecosystem health compares current condition to the historic one using desired condition descriptions of natural communities, historic vegetation, site quality rankings and examples of high quality sites.

Reinstating historic disturbance processes should recover natural community structure, plant species composition and biological diversity that evolved in response to the physical environment. Management methods generally include thinning of undesirable woody species, prescribed burning, select treatment of non-native invasive plant species, and some reseeding – all prescribed using the effects of various disturbance regimes outlined previously. Restoration of natural communities generally takes two to three decades or more before achieving the maintenance stage of re-establishing grass/forb structure. Restoring canopy composition and structure may take a hundred years or longer!

Maintenance

Ecosystem maintenance includes the periodic prescribed application of management activities to retain structure, diversity and composition of select natural communities. This happens when the resource is nearing the desired condition; that is, once critical elements of community structure, physical processes or the environment are largely restored. Maintenance activities generally include prescribed burning to mimic historic fire, select silvicultural practices tailored to restoring woody structure, periodic checks and control of non-native, invasive species, and monitoring against risks and threats such as animal overpopulations, especially white-tailed deer, to ensure that their numbers do not exceed the balance and capacity of the natural community. The amount of land on the Mark Twain National Forest estimated to be approaching natural community maintenance (desired condition achieved) is less than 3,000 acres. This is not surprising as the majority of other public lands managed by the Missouri Department of Conservation, Missouri Department of Natural Resources, The US Fish and Wildlife Service, National Park Service and non-profit conservation organizations have not reached desired high integrity ecological conditions, primarily because all have inherited already heavily damaged or degraded lands following a

century of post-European settlement resource exploitation. The recovery of diverse ecosystems first requires an in-depth understanding and agreement on what they were. Additionally, management experience demonstrates recovery, especially plant species accrual, is a long and slow process.

Reconstruction

Reconstruction is the re-establishment of a natural community or elements thereof that have been nearly completely destroyed. Management methods include site preparations to remove non-native invasive species, soil preparation, burning to prevent undesirable woody or non-native species invasion, planting and seeding. This phase is very labor intensive and usually very costly. Generally, the Mark Twain will not have to reconstruct glades, certain woodland natural communities, fens and forest types. Natural communities requiring reconstruction activities may include prairie, bottomland hardwood forests and woodlands, some fens and savannas.

Appendix E

Wild and Scenic Rivers (WSR) Assessment Process



Mark Twain
National Forest

Cover image: Canoeists on Eleven Point Scenic River

Photographer: Wilmer Scott, Mark Twain National Forest

Appendix E

Wild and Scenic River Assessment Process

Mark Twain National Forest Wild and Scenic Rivers (WSR) Assessment Process

What follows is the process used to complete steps outlined in protocol sent out by the WO in November 1996 to complete this assessment as part of the Forest Plan Revision for the Mark Twain National Forest.

Step 1 – Review Status of Existing Forest Plan

Current Situation: The 1986 Forest Plan:

- Identified potential rivers for evaluation based on a Forest-wide analysis. The Forest used the nationwide inventory prepared by USDI, 1979 and "5(d) river" (Forest Plan FEIS Appendix C-2 p. C2-1)
- Completed an eligibility evaluation of potential river segments (Forest Plan FEIS Appendix C; Forest Plan p. IV-189 and IV-190)
- Determined the best potential classification of each river segment (Forest Plan FEIS Appendix C; Forest Plan p. IV-189 and IV-190)
- Provided standards and guidelines to ensure protection of eligible rivers to their highest classification (Forest Plan FEIS Appendix C; Forest Plan p. IV-189 and IV-190)

Rivers identified as eligible for national designation under the existing Forest Plan are:

- North Fork of the White River (segment from milepost 18-30) (Recreation River)
- St. Francis (Scenic River)

Rivers identified as not eligible for national designation under the existing Forest Plan are:

- Cedar Creek
- Courtois Creek
- Huzzah Creek
- North Fork of the White River (segment from milepost 1-18)

Rivers identified under WSRA section 5(a) for suitability study were the Gasconade and Big Piney rivers. The Department of Interior found these rivers suitable for national designation as scenic segments in 1975, recommended inclusion in the Wild and Scenic River system. The protective covenants for these rivers expired three years after this recommendation. Rivers are still eligible for national designation under WSRA section 5d (1) and will remain under Management Prescription 6.3.

Step 2 – Identify Potential Rivers

Part 1 – Validate Rivers classified in the 1986 Forest Plan

Validate the status of current candidate rivers, and update as needed after reviewing any changed conditions such as land acquisitions, river resources, state designations, federal statues and settlement agreements.

Part 2 – Identify Additional rivers to Inventory

In response to changes in the Nationwide Rivers Inventory, new information and public comments on the Notice of Intent, the Forest decides to complete an analysis to identify additional potential rivers during this assessment.

Resources used to identify additional potential rivers:

- Missouri Department of Natural Resources list of outstanding state resource waters;
- The Nature Conservancy's Ozark Eco-regional Assessment;
- Nationwide Rivers Inventory;

Additional potential rivers identified are:

- Black River through the Poplar Bluff unit
- Indian Creek within Willow Springs unit
- Mill Creek within Houston/Rolla unit
- Neals Creek within the Potosi unit
- Noblett Creek within Willow Springs unit
- Spring Creek within Houston/Rolla unit
- Spring Creek within Willow Springs unit
- Swan Creek within the Ava unit

Step 3 – Eligibility Evaluation

Determine whether a river is (1) free-flowing, and (2) possesses one or more outstanding remarkable river-related values.

- Adjust and refine Evaluation Criteria for Eligibility Inventory developed by R9, and use to define Outstanding Remarkable Values within the Ozark Highlands (see attached document) in order to determine the Outstandingly Remarkable Values for each stream.
- Validate eligibility for existing Candidate rivers.
- Determine eligibility for additional rivers identified in Step 1, Part 2.

Step 4 – Classification

Classify eligible rivers as Wild, Scenic or Recreational

- Validate current Classification of existing Candidate rivers
- Classify any additional potential rivers that are found eligible in previous step.

Current Forest Plan direction protects the eligible river corridors under Management Prescription 6.3. Standards and guidelines vary based on classification, and are designed to maintain or enhance the current condition of these river corridors. There is no proposal to change this direction in the Revised Forest Plan. Any rivers identified as eligible would be allocated to Management Prescription 6.3.

Step 5 – Suitability

Determine suitability and make recommendations for inclusion into the W&SR system.

In the 1986 Forest Plan, a Suitability study for a Candidate River would be completed under one of two situations:

- The Forest Service will work with State and other Federal agencies, organizations and individuals to determine when a river study(s) should be initiated (Forest Plan, page IV-189.)
- A suitability study will be completed and its findings the basis for Forest Service approval or disapproval of developmental proposals that could disqualify National Forest Systems lands within inventory river corridors for National River consideration (Forest Plan, page IV-190).

There has not been any interest expressed by the State or other agencies or organizations to seek designation on any of Candidate River or any other waterways in Missouri since implementation of 1986 Plan. We do not propose to conduct any suitability studies during the Forest Plan revision.

Mark Twain National Forest Wild and Scenic River Evaluation Eligibility Form

Outstandingly Remarkable Values Evaluation Criteria for Mark Twain National Forest

Scenic Values

Adjacent Landform

Class A –Landforms adjacent to the river are characterized by ridges with slopes above 25 percent and areas with abrupt topographic changes including bluffs, caves or rock outcroppings. Gravel is present but not dominant.

Class B – There are some steep banks or slopes to river, but generally the landscape is characterized by broad ridges with long gently to strongly sloping side slopes of 5–25 percent dissected with short drainages. Topographic changes may include bluffs, caves or rock outcroppings. Gravel beds and sandbars occur both near banks and mid-river.

Class C – There are few, if any, steep banks or slopes. Gradual slopes are more common. Low, short hills and flatland with less than 5 percent slope are common.

Vegetation

Class A – There is a variety of vegetation types in interesting patterns and textures. Forest cover is mostly continuous and characterized by large trees including most species usually found within riverine ecosystems. There is a high degree of vegetative patterns (trees, shrubs, and ground cover). Forest regeneration areas and agricultural lands are visible part of the year, usually outside of the primary recreational season.

Class B – There is some variation in vegetative types. Deciduous trees are more predominant, than evergreens. Forested areas contain smaller to middle-sized trees, including some species, which are usually found within riparian ecosystems. There is a high degree of vegetative patterns (trees, shrubs, and ground cover) and diversity in plant species is common for the Ozark Highlands. Forest regeneration areas, commercial structures and agricultural lands are present, though are not predominant features.

Class C – There is little variation in vegetative types and patterns. Deciduous trees are common throughout landscape, and the understory is dense so that views through the forest are limited. Commercial structures, agricultural and forest regeneration areas are common.

Water Features

Class A – Water features include a variety of still water and ripples, or even cascades. There are no man-made impoundments along the river segment. Water flow is consistent throughout the year.

Class B – Water flow typically is slow moving and meandering with some still areas or ripples. Downed trees or rocks cause some of the ripples. There are no man-made impoundments along the river segment. Water flow is fairly consistent most of the year.

Class C – Ripples are the exception; they may be caused by fallen trees (logs) or gravel in the river. There may be man-made impoundments or water diversions if river segments generally remain natural and riverine in appearance. Water flow is low during summer and dry months throughout the year.

Recreational Values

Span of Attraction

Class A – Visitors are willing to travel from outside the geographic region or state to use river resources for recreational purposes. River has been featured in national publications.

Class B – Visitors are willing to travel from other locations within the geographic region or state to recreate along the river and its corridor. River has been featured in statewide publications.

Class C – Most visitors are from the local area.

Water Sports

Class A – River provides unusual opportunities for canoeing and boating. River contains a variety of rapids, including those with an international rating Class II or higher. Access points along the river provide for a variety of trip lengths that users can tailor to their needs (day trips, ½ day trips, or overnight trips).

Class B – River provides opportunities for a variety of watercraft. River may contain some rapids, including those with an international rating Class I or Class II. There are river access points, but opportunities for flexibility in trip planning may be more limited (e.g. length between access points requires a day trip). River provides opportunities for swimming or other water sports.

Class C – River provides opportunities for a variety of watercraft. River does not contain any rapids. River access is limited. Low water flows in summer limit opportunities for swimming and other water sports.

Fishing

Class A – Fishing success rate and size of take is unusual for the geographic region. River may contain game fish species not found elsewhere in the Ozark Highlands.

Class B – Fishing success rate and size of catch may be above average for the local area but are common throughout the geographic region. Streams may be managed for specific game fish species.

Class C – Fishing success rate and size of catch are common for the geographic region.

Geologic Values

Class A – River and its corridor contain examples of a geologic feature, process, or phenomena that is rare, unusual, one-of-a-kind, or unique within the Ozark Highlands section. The feature(s) represent a significant or rare combination of features.

Class B – River and its corridor contains geologic features and formations that are significant in the local area but are typical of those commonly found throughout the Ozark Highlands section.

Class C – River does contain geologic features and formations and offers no significant features.

Fish and Aquatic Community Values

Class A – River contains resident fisheries populations or aquatic communities that occur only because of the character of the river. The area within the river corridor provides exceptionally high-quality habitat for fish or aquatic organisms of national importance or may provide unique habitat or a critical link in habitat conditions. River may also contain an unusual diversity of species within the Ozark Highlands.

Class B – River contains high-quality fisheries or aquatic community habitat that is uncommon in the local area but may be common throughout the Ozark Highlands section. The area within the river corridor may provide unique habitat or a critical link in habitat conditions for Federal, State, or Forest-listed sensitive species.

Class C – River contains fisheries or aquatic community habitats that are not unique, rare, or critical. These habitats are common throughout the Ozark Highlands section.

Wildlife Values

Class A – River and its corridor contain resident wildlife populations that occur because of riverine vegetation adjacent to the river. The area within the river corridor provides exceptionally high-quality habitat for wildlife of national significance, or provide unique habitat or a critical link in habitat conditions. River corridor may also contain an unusual diversity of species within the Ozark Highlands.

Class B – River and riverine area contain high-quality wildlife habitat that is uncommon in the local area but may be common throughout the Ozark Highlands section. The lands within the river corridor may provide unique habitat or a critical link in habitat conditions for Federal, State, or Forest-listed sensitive species.

Class C – River and riverine area contain wildlife habitat that is common to the Ozark Highlands section, and this indicates that wildlife and wildlife habitats are not significant, rare, or critical.

Prehistory and Historic Values

Class A – Cultural sites within the corridor have unusual characteristics, or exceptional research or interpretive values of national significance. These river corridors contain sites of national importance and have been determined eligible for or are listed on the National Register of Historic Places (NRHP).

Class B – The river corridor contains cultural sites of State and local significance that are potentially eligible for listing on the NRHP. Sites may be similar to others known throughout the region but are unique to the local area. Sites may have interpretive value. Some sites may have been disturbed prior to being archaeologically recorded.

Class C – The river corridor contains sites common to the Ozark Highlands section. Known sites have been determined or most probably are ineligible for listing in the NRHP.

Botanical Values

Class A –Riparian forests along the river corridor are contiguous, with little fragmentation by human activity. Plant communities in the river corridor are rare

throughout the Ozark Highlands section and have little evidence of human disturbance or invasion by exotics. River and its corridor may also contain an unusual diversity of species within the Ozark Highlands.

Class B –Riparian forests along the river corridor remain largely contiguous; however, there may be fragmentation caused by human activity. Locally significant plant communities or plants rare within the state may be present along the river corridor. Species diversity is common within the Ozark Highlands. There may be some uncontrolled invasions of exotic weedy species.

Class C – River and riparian areas contain plant species and/or communities common to the Ozark Highlands section. Riparian area may be greatly disturbed by artificial means and/or highly fragmented. Other disturbed and/or artificial communities and uncontrollable invasion of exotics may be present.

Wild and Scenic River Evaluation Eligibility Forms for Individual Inventoried Streams

Wild and Scenic Rivers Eligibility Evaluation Form
Outstandingly Remarkable Values (ORVs)
Mark Twain National Forest
Black River

Name of Stream: Black River ID Number: 950401
UNIT – Ranger District: Poplar Bluff Quad(s): Williamsville, Hendrickson, and Poplar Bluff

Segment: Markham Springs to southern District Boundary		
Segment miles = 15.7	Miles of bank = 31.4	Percent
NF Ownership	3.9	12%
Private Lands	27.5	88%

ELIGIBILITY DETERMINATION: Eligible for WSRA– Recreation River
River is free-flowing.
River has two outstandingly remarkable values. A cultural site found within a FS campground, heritage resources along the river are similar to the St. Francis River, which contains a very concentrated group of prehistoric sites representing the entire span of Native American occupation and numerous historic settlements. There is also an abundance of aquatic species found within the river.

SCENIC VALUES

Adjacent Landforms
Class C – Most features are common to this area.

Vegetation
Class C – Pastures and forest regeneration areas are common especially within private ownership.

Water Features
Class B – This portion of the river is below the dam forming Clearwater Lake; river is wider and slower, with no rapids and few ripples.

RECREATIONAL VALUES

Span of Attraction
Class B – Visitors travel from the St. Louis area and parts of Illinois and Tennessee. There is also a large amount of local visitation.

Water Sports
Class C – River provides opportunities for a variety of watercraft most of the year. Public river access is limited. The Army COE regulates water flows from Clearwater Dam.

Fishing
Class C – Good float-fishing stream above Hilliard Bridge with mostly motorboat use below, fishing success rate and size of catch is common for the geographic region.

GEOLOGICAL FEATURES

Class C – There is a Bluff trail located above the Markham Springs campground.

FISH AND AQUATIC COMMUNITIES

Class A – River contains high-quality fisheries or aquatic community habitats that are uncommon in abundance of species found within the Ozark Highlands region. Such as the endangered species pink mucket.

WILDLIFE VALUES

Class B – The Swainson's warbler which is a priority species for Partners In Flight within the Ozark Ouachita Highlands has been found within the river corridor.

CULTURAL AND HISTORIC VALUES

Class A – The river corridor contains a cultural site eligible for listing on the NRHP. The Markham Springs mill is also on the site of prehistoric occupation and is located within 500' of the river. Railroad tracks parallel the river from north of Leeper to Poplar Bluff, most of its length and entirely within the District boundary.

BOTANICAL VALUES

Class C – The forest along the river corridor is fragmented by pastures and croplands.

Wild and Scenic Rivers Eligibility Evaluation Form
Outstandingly Remarkable Values (ORVs)
Mark Twain National Forest
Cedar Creek

Name of Stream: Cedar Creek ID Number: 950810
UNIT –
Ranger District: Cedar Creek unit – H/R/CC Quad(s): Millersburg, Millersburg SE, Jefferson City SW

Segment: Between North and South District Boundary		
Segment miles = 29	Miles of bank = 58.0	Percent
NF Ownership	5.0	8%
Private Lands	52.0	90%
State Lands	1.0	2%

ELIGIBILITY DETERMINATION: Not Eligible for WSR.
River is free-flowing. No Outstandingly remarkable values.
Do not consider further.

A one mile section of Cedar Creek just north of the District boundary is listed by the Environmental Protection Agency as a 303 (d) water required to have total maximum daily loads analyzed due to sulfates (www.epa.gov).

SCENIC VALUES

Class C – nothing outstanding

RECREATIONAL VALUES

Class C – Most visitors are from the local area.

Canoes and kayaks are the primary watercraft; flow is dependent on rainfall.

GEOLOGICAL FEATURES

Class B – Two limestone chimney rock formations are located along stream, common to others found within the areas along the Missouri River.

FISH AND AQUATIC COMMUNITIES

Class C - Waters are still recovering from past coal mining throughout the stream corridor.

WILDLIFE VALUES

Class C – none

CULTURAL AND HISTORIC VALUES

Class C –none outstanding

BOTANICAL VALUES

Class C – none outstanding.

Wild and Scenic Rivers Eligibility Evaluation Form
Outstandingly Remarkable Values (ORVs)
Mark Twain National Forest
Courtois Creek

Name of Stream: Courtois Creek ID Number: 950510
UNIT –
Ranger District: Potosi unit– P/FT Quad(s): Huzzah, Berryman, Courtois, Onondaga Cave

Segment: Huzzah Creek to Brazil, MO		
Segment miles = 18	Miles of bank = 36.0	Percent
NF Ownership	9.0	25%
Private Lands	19.5	54%
State Lands	7.5	21%

ELIGIBILITY DETERMINATION: Not Eligible for WSRA.
River is free-flowing. No outstandingly remarkable values.
Do not consider further.

SCENIC VALUES

Class C – nothing outstanding

RECREATIONAL VALUES

Class B – Rapids with an international rating Class I or Class II, the Meramec basin ranks first out of thirty-six watersheds in a statewide fishing pressure survey, which includes the lower 15 miles of Courtois Creek.

GEOLOGICAL FEATURES:

Class C – none.

AQUATIC COMMUNITIES:

Class C – nothing outstanding

WILDLIFE VALUES

Class B – River and riparian area contains a resident population of gray bats that occur because the river is used as foraging habitat, though not unique or a critical link.

PREHISORIC AND HISTORIC VALUES

Class B – The river corridor contains prehistoric sites such as rock shelters, and campsites. Historic sites include 19th century settlements, lead mines and early 20th century homesteads. These sites would be similar to other sites known throughout the region.

BOTANICAL VALUES

Class B – Locally significant species tussock sedge and Butternut hickory found along many streams within the Ozark Highlands.

Wild and Scenic Rivers Eligibility Evaluation Form
Outstandingly Remarkable Values (ORVs)
Mark Twain National Forest
Huzzah Creek

Name of Stream: Huzzah Creek ID Number: 950511
UNIT –
Ranger District: Potosi unit– P/FT Quad(s): Huzzah, Davisville, Onondaga Cave

Segment: Meramec River to Dillard, MO		
Segment miles = 28	Miles of bank = 56.00	Percent
NF Ownership	4.25	8%
Private Lands	48.50	86%
State Lands	3.25	6%

ELIGIBILITY DETERMINATION: Eligible for WSR – Recreation River.
River is free-flowing.
This creek has one outstandingly remarkable value, prehistoric and historic sites.
This is one of three rivers within the Meramec watershed listed on the National Rivers Inventory, including Courtois creek and the Meramec River.

National Rivers Inventory Outstandingly Remarkable Values – S (Class B), R (Class B), W (Class B), and H (Class A)

SCENIC VALUES

Adjacent Landforms

Class B – Topographic changes may include bluffs, caves or rock outcroppings that are locally common to the Ozark Highlands section. Gravel beds and sandbars occur both near banks and mid-river.

Vegetation

Class C – There is little variation in vegetative types and patterns. Pastures and forest regeneration areas are common.

Water Features

Class B – flow typically is slow moving and meandering with some still areas or ripples. Downed trees cause some of the ripples.

Stream is floatable most of the year.

RECREATIONAL VALUES

Span of Attraction

Class B – Visitors are willing to travel from other locations in the geographic region or state to recreate along the river and its corridor. River has been included in statewide publications.

Water Sports

Class B – River provides opportunities for a variety of watercraft. River may contain some rapids, including those with an international rating Class I or Class II. Access points along the river provide for a variety of trip lengths that users can tailor to their needs (e.g. day trips, ½ day trips, or overnight trips). River provides opportunities for swimming or other water sports. Water flow is consistent most of the year.

Fishing

Class B – Fishing success rate and size of catch may be above average for the local area but are common throughout the geographic region.

The Meramec basin ranks first out of thirty-six watersheds in a statewide fishing pressure survey. This stream is managed by MDC for trout and smallmouth bass from Scotts Ford north outside of FS lands.

GEOLOGICAL FEATURES

Class B – Red Bluff, a dolomite cliff is listed in the Geologic Natural Features Classification system for Missouri.

FISH AND AQUATIC COMMUNITIES

Class C – River contains fisheries or aquatic community habitats that are not unique, rare, or critical. A heptagenid mayfly and the four-toed salamander, may be present within the river corridor.

WILDLIFE VALUES

Class B –The area within the river corridor provides habitat for wildlife of national significance (gray bat). This species is found along many other streams within the Ozark Highlands section where caves are located.

The northern myotis a state species of concern may also be found with the river corridor.

CULTURAL AND HISTORIC VALUES

Class A – The river corridor contains one cultural site that is on the NRHP and one cultural site which has been nominated for listing on the NRHP due to its State and local significance; Brickey house place near the Trail of Tears northern route crossing. Three prehistoric villages were recorded by Henry Schoolcraft just north of Davisville.

BOTANICAL VALUES

Class B –Forest along the river corridor remains largely contiguous; however, there may be fragmentation caused by pastures and resorts. Locally significant plant communities or plants that are rare within the state may be present along the river corridor. Butternut hickory found along many streams within the Ozark Highlands.

Wild and Scenic Rivers Eligibility Evaluation Form
Outstandingly Remarkable Values (ORVs)
Mark Twain National Forest
Indian Creek

Name of Stream: Indian Creek ID Number: 952112
UNIT –
Ranger District: Willow Springs unit- A/C/WS Quad(s): Cabool SE, Dyestone Mountain and Nichols Knob

Segment: Howell County Road 5590 (T27N,R10W,S23) to North Fork of the White River		
Segment miles = 20	Miles of bank = 40.0	Percent
NF Ownership	5.5	14%
Private Lands	34.5	86%

ELIGIBILITY DETERMINATION: Not Eligible for WSRA
River is free-flowing. There are no outstandingly remarkable values.
Do not consider further.

Currently this stream is managed as a Forest Special Area as a candidate for State Natural Area status, emphasizing protection from disrupting activities.

SCENIC VALUES

Class B – Common landforms, forest regeneration areas and pastures are visible, and water flow typically is slow moving and meandering with some still sections or ripples

RECREATIONAL VALUES

Class C – none remarkable.

GEOLOGICAL FEATURES

Class C – none remarkable.

FISH AND AQUATIC COMMUNITIES

Class B – RFSS listed species common within the Ozark Highlands.

WILDLIFE VALUES

Class C – nothing uncommon

CULTURAL AND HISTORIC VALUES

Class B –Type of sites and their density are similar to other streams like the North Fork of the White River found within the local area.

BOTANICAL VALUES

Class B – showy lady’s slipper

Wild and Scenic Rivers Eligibility Evaluation Form
Outstandingly Remarkable Values (ORVs)
Mark Twain National Forest
Mill Creek

Name of Stream: Mill Creek ID Number: 950311
UNIT –
Ranger District: Rolla unit- H/R/CC Quad(s): Kaintuck Hollow and Newburg

Segment: Yelton Springs to Little Piney River		
Segment miles = 7.7	Miles of bank = 15.0	Percent
NF Ownership	6.8	45%
Private Lands	8.7	55%

ELIGIBILITY DETERMINATION: Not Eligible for WSR
River is free-flowing. There are no outstandingly remarkable values.
Do not consider further.

SCENIC VALUES

Class C – Little variety in landform, pastures are typical sites, no water features present.

RECREATIONAL VALUES

Span of Attraction

Class C – Most visitors are from the local area

Water Sports

Class C –Low water flows limit opportunities for swimming and other water sports.

Fishing

Class B – MDC Trout management area from Yelton Springs to Little Piney River, includes periodic stocking of rainbow trout. Most other species are not large enough to keep.

GEOLOGICAL FEATURES

Class C – none

FISH AND AQUATIC COMMUNITIES

Class C – none outstanding

WILDLIFE VALUES

Class C – none

CULTURAL AND HISTORIC VALUES

Class B – none outstanding

BOTANICAL AND ECOLOGICAL VALUES

Class C – none outstanding

Wild and Scenic Rivers Eligibility Evaluation Form
Outstandingly Remarkable Values (ORVs)
Mark Twain National Forest
Neal's Creek

Name of Stream: Neal's Creek ID Number: 950514
UNIT –
Ranger District: Potosi unit- P/FT Quad(s): Viburnum East and Oates

Segment: From headwaters to Strothers Creek		
Segment miles = 8.25	Miles of bank = 16.50	Percent
NF Ownership	12.25	74%
Private Lands	4.25	26%

ELIGIBILITY DETERMINATION: Not Eligible for WSRA.
River is free-flowing. No outstandingly remarkable values.
Do not consider further.

SCENIC VALUES

Adjacent Landforms

Class C – none outstanding.

Vegetation

Class B – There is some variation in vegetation types within forested areas primarily within FS ownership; deciduous trees are more predominant, than evergreens. Pastures are common on private lands.

Water Features

Class C – very low water levels except in areas with beaver dams. There is little variation in water flow and a number of vehicles crossings on the county road paralleling the stream.

RECREATIONAL VALUES

Span of Attraction

Class C – only local use, if any.

Water Sports

Class C – none

Fishing

Class C – none recorded

GEOLOGICAL FEATURES

Class C – Stream contains a bedrock bottom in some stretches that lend to the formation of a fen in one area within FS managed lands.

AQUATIC COMMUNITIES

Class C – most of the stream is too shallow to contain fisheries; there are no rare or critical community habitats, though Barton's fen is present within the watershed.

WILDLIFE VALUES

Class B – Barton fen is located along this stream and has a population of Hines' Emerald dragonfly which needs very specialized habitat associated with a calcareous or limestone/dolomite fen.

PREHISTORIC AND HISTORIC VALUES

Class C – none outstanding.

BOTANICAL VALUES

Class C – none outstanding.

Wild and Scenic Rivers Eligibility Evaluation Form
Outstandingly Remarkable Values (ORVs)
Mark Twain National Forest
Noblett Creek

Name of Stream: Noblett Creek ID Number: 952114
UNIT –
Ranger District: Willow Springs unit- A/C/WS Quad(s): Dyestone Mountain

Segment: Junction with nameless creek in T27N, R10W, S36 to above Noblett Lake (Dam).		
Segment miles = 1.3	Miles of bank = 2.6	Percent
NF Ownership	1.7	66%
Private Lands	0.9	34%

ELIGIBILITY DETERMINATION: Not eligible for WSRA.
River is free-flowing. No outstandingly remarkable values.
Do not consider further.

Currently this stream is managed as a Forest Special Area as a part of the Carman Springs State Natural Area. Management will emphasize protection from any disrupting activities.

SCENIC VALUES

Class B – nothing outstanding.

RECREATIONAL VALUES

Class C – Most visitors are from the local area.

Low water flows limit opportunities for water sports. Fishing is limited to the lower reaches.

GEOLOGICAL FEATURES

Class C – none

FISH AND AQUATIC COMMUNITIES

Class C – species are common

WILDLIFE VALUES

Class C – none

CULTURAL AND HISTORIC VALUES

Class B – Flows through Carman Springs Management Area; not a river related site.

BOTANICAL VALUES

Class B – Showy lady‘s slipper

Wild and Scenic Rivers Eligibility Evaluation Form
Outstandingly Remarkable Values (ORVs)
Mark Twain National Forest
North Fork of the White River

Name of Stream: North Fork of the White River ID Number: 952110
UNIT –
Ranger District: Willow Springs unit –A/C/WS Quad(s): Cabool SW, Nichols Knob, Dora, Curreall NW

Segment: North District Boundary to Hebron Access		
Segment miles = 18	Miles of bank = 36.0	Percent
NF Ownership	5.1	14%
Private Lands	30.7	86%

Segment: Hebron Access to South District Boundary, through Devils Backbone Wilderness		
Segment miles = 12	Miles of bank = 24.26	Percent
NF Ownership	10.20	22%
Private Lands	13.80	77%
State Lands	0.26	1%

ELIGIBILITY DETERMINATION: Eligible for WSR – Recreation River.
River is free-flowing.
Outstandingly remarkable values are related to fishing and aquatic and wildlife species found within this river. Of the streams within the White River watershed, the southern segment of this river is a great example of this type of river with possible access to the public.

National Rivers Inventory Outstandingly Remarkable Values – S (Class B), R (Class A), G (Class B), F (Class A), W (Class A), and H (Class B)

SCENIC VALUES

Adjacent Landforms

Class B – Topographic changes include bluffs, caves or rock outcroppings) which are common throughout the Ozark Highlands section. Gravel beds and sandbars occur near banks and mid-river.

Vegetation

Class B – Deciduous trees are more predominant, than evergreens. Forested areas contain small to middle-sized trees. Forest regeneration areas and pastures are visible, though not prominent features.

Water Features

Class B – Includes a variety of still water and ripples, even cascades may be present.

RECREATIONAL VALUES

Span of Attraction

Class B – Visitors are willing to travel from other locations in the geographic region or state to recreate along the river and its corridor.

Water Sports

Class B – River provides opportunities for a variety of watercraft and may contain some rapids, including those with an international rating Class I or II. Access points along the river provide for a variety of trip lengths that the users can tailor to their needs. Water flow is consistent most of the year.

Fishing

Class A – Fishing success rate and size of take may be above average for the local area but are common throughout the geographic region. Ranks 12th of 36 watersheds (MDC). Stream is managed for trout in last 1-1/2 miles within Forest boundary.

GEOLOGICAL FEATURES

Class C – nothing outstanding.

FISH AND AQUATIC COMMUNITIES

Class A –The area within the river corridor provides exceptionally high-quality habitat for the Ozark Hellbender.

WILDLIFE VALUES

Class A – The area within the river corridor contains a major maternity cave for wildlife of national significance. The gray bat is found along many other streams within the Ozark Highlands section where similar caves are located.

CULTURAL AND HISTORIC VALUES

Class B – The river corridor contains heritage sites that are likely to be of regional or national importance that may meet NRHP significance criteria. None appears to be suitable for public interpretation.

Type of sites and their density are similar to other streams found within the local area.

Some sites may have been disturbed prior to being archaeologically recorded.

BOTANICAL VALUES

Class B – Locally significant plant communities, or plants rare within the state may be present along the river corridor.

Wild and Scenic Rivers Eligibility Evaluation Form
Outstandingly Remarkable Values (ORVs)
Mark Twain National Forest
St. Francis River

Name of Stream: St. Francis River ID Number: 950513
UNIT –
Ranger District: Fredericktown unit – P/FT Quad(s): Lake Killarney, Rhodes Mountain, Rock Pile Mountain

Segment: River between north (Roselle) and south District boundaries.		
Segment miles = 17	Miles of bank = 34.00	Percent
NF Ownership	7.25	21%
Private Lands	23.75	71%
State Lands	3.00	8%

ELIGIBILITY DETERMINATION: Eligible for WSR – Scenic River
This river has numerous outstandingly remarkable values. Though some values are similar to the Eleven Point or Current Rivers, there are differences due to terrain and geologic features of the area, which contribute to the whitewater runs found on the river.

National Rivers Inventory Outstandingly Remarkable Values – S (Class A), R (Class A), G (Class A), H (Class A)

SCENIC VALUES

Adjacent Landforms

Class A – Landforms adjacent to the river is characterized by ridges with slopes greater than 25% and areas with abrupt topographic changes including shut-ins, bluffs, rock outcrops and caves. Large boulders are more dominant than gravel.

Vegetation

Class B – There is some variation in vegetative types. Deciduous trees are more predominant than evergreens. Forest cover is mostly continuous and characterized by mature trees. Forest regeneration areas are visible, though not predominant features.

Water Features

Class A – Seasonal flows include a variety of still water and rapids.

RECREATIONAL VALUES

Span of Attraction

Class A - Visitors are willing to travel outside the geographic region and state to use the river resource for recreational purposes. River has been included in national publication.

Water Sports

Class A – River provides unusual opportunities for canoeing and kayaking and contains a variety of rapids, including those with an international rating Class II or

higher. This waterway is used for the annual Missouri State Whitewater Championship races. There are river access points, but opportunities for flexibility in trip planning are more limited. Low water flows throughout most of the year limit boating opportunities.

Fishing

Class B – Fishing success rate and size of catch may be above average for the local area but are common throughout the geographic region, ranks 15th out of 38 watersheds surveyed (MDC).

GEOLOGICAL FEATURES

Class A – Silver Mines Shut-in (a granite shut-in) and a basic dike near the Silver Mine area are listed in the Natural Areas Journal.

AQUATIC COMMUNITIES

Class B – River may provide unique habitat for the endemic St. Francis crayfish and Western fanshell.

WILDLIFE VALUES

Class B – The area within the river corridor provides high-quality habitat conditions.

CULTURAL AND HISTORIC VALUES

Class A – Native Americans camped and farmed here for several thousand years. A silver mine operated here in the late 19th century; tungsten was mined in the early 20th century. These mines are unique to the mid-continent, along with the entire complex of mines, dam, milling and support features and the company town.

BOTANICAL VALUES

Class B – Locally significant plant communities within the state may be present along the river corridor.

Wild and Scenic Rivers Eligibility Evaluation Form
Outstandingly Remarkable Values (ORVs)
Mark Twain National Forest
Spring Creek

Name of Stream: Spring Creek ID Number: 950312
UNIT –
Ranger District: Rolla unit- R/H/CC Quad(s): Big Piney, Flat and Devil's Elbow

Segment: From Relfe Spring to Big Piney River		
Segment miles = 6.5	Miles of bank = 13.0	Percent
NF Ownership	3.6	28%
Private Lands	9.4	72%

ELIGIBILITY DETERMINATION: Not Eligible for WSRA.
River is free-flowing. There are no outstandingly remarkable values.
Do not consider further.

SCENIC VALUES

Class C – nothing outstanding

RECREATIONAL VALUES

Class B – Most visitors are from the local area, river access is limited for the public. Low water flows limit opportunities for water sports.

MDC manages a Wild Trout Management Areas from Relfe Springs to junction with Big Piney River, no stocking of trout.

GEOLOGICAL FEATURES

Class C – none

FISH AND AQUATIC COMMUNITIES

Class B – This stream is one of the few naturally-sustaining wild trout streams in southern Missouri, most all others are regularly stocked.

WILDLIFE VALUES

Class C – none

CULTURAL AND HISTORIC VALUES

Class B – nothing outstanding

BOTANICAL VALUES

Class C – none.

Wild and Scenic Rivers Eligibility Evaluation Form
Outstandingly Remarkable Values (ORVs)
Mark Twain National Forest
Spring Creek

Name of Stream: Spring Creek ID Number: 952113
UNIT –
Ranger District: Willow Springs unit- A/C/WS Quad(s): Dyestone Mountain, Siloam Springs and Dora

Segment: Junction of two North and South Forks of Spring Creek in T26N, R10W, S23 (south of Hwy 76)		
Segment miles = 20	Miles of bank = 40.0	Percent
NF Ownership	9.4	44%
Private Lands	12.1	56%

ELIGIBILITY DETERMINATION: Not eligible for WSRA.
River is free-flowing. There are no outstandingly remarkable values.
Do not consider further.

Currently this stream is managed as a Forest Special Area as a part of the Carman Springs State Natural Area. Management will emphasize protection from any disrupting activities.

SCENIC VALUES:
Class B – nothing outstanding

RECREATIONAL VALUES:
Class C – Most visitors are from the local area.

River access and low water flows limit water sports.

GEOLOGICAL FEATURES
Class C – none

FISH AND AQUATIC COMMUNITIES
Class C – none.

WILDLIFE VALUES
Class C – none

CULTURAL AND HISTORIC VALUES
Class B – This waterway flows through Carman Springs Management Area which has been proposed as a National Register of Historic Places District. This area contains a very rich array of cultural resources including relatively uncommon archeological properties with respect to the Missouri Ozarks and the Mark Twain National Forest.

BOTANICAL AND ECOLOGICAL VALUES
Class B – Species of concern include: Butternut, a vanishing tree species, and Showy lady's slipper.

Wild and Scenic Rivers Eligibility Evaluation Form
Outstandingly Remarkable Values (ORVs)
Mark Twain National Forest
Swan Creek

Name of Stream: Swan Creek ID Number: 952111
UNIT –
Ranger District: Ava – A/C/WS Quad(s): Keltner, Garrison, and Chadwick

Segment: Between the north and south District Boundaries		
Segment miles = 19	Miles of bank = 38.0	Percent
NF Ownership	3.0	8%
Private Lands	35.0	92%

ELIGIBILITY DETERMINATION: Not Eligible for WSRA.
River is free-flowing. There are no outstandingly remarkable values.
Do not consider further.

SCENIC VALUES

Class B – nothing outstanding or remarkable.

RECREATIONAL VALUES

Class C – Most visitors are from the local area.

River access and low water flows limit opportunities for water sports.

GEOLOGICAL FEATURES

Class C – none

FISH AND AQUATIC COMMUNITIES

Class B – There is an abundance of aquatic species though all are common.

WILDLIFE VALUES

Class C – none that are river-related.

CULTURAL AND HISTORIC VALUES

Class B – nothing outstanding, though a large number of sites present.

BOTANICAL VALUES

Class C – No outstanding river-related species.

Appendix F

Recreation Opportunity Spectrum



Mark Twain
National Forest

Cover image: Camping at Pine Ridge Campground

Photographer: Charlie Gill, Mark Twain National Forest

Appendix F

Recreation Opportunity Spectrum

Introduction

In late 1970s the National Forests started using a nationally recognized classification system called the Recreation Opportunity Spectrum (ROS) to describe different recreation settings, opportunities, and experiences. The system helps inventory existing conditions as well as to describe objectives for alternatives to future use.

Inventory Process

The Recreation Opportunity Spectrum Inventory Mapping Protocol found in "A Technical Guide for Integrating Recreation, Heritage, and Wilderness into Land and Resource Management Planning" (2003) was the basis for the inventory process on the Mark Twain National Forest.

Steps outlined in the Technical Guide were adjusted as noted below. Geographical Information System (GIS) data layers and coverages were used. All acres are spatially represented and may not match exactly to those on the ground.

Step 1

A map was developed, creating and utilizing GIS layers, to illustrate motorized and non-motorized ROS settings by applying ½ mile buffers around travel routes. Motorized ROS settings fall within ½ mile of motorized travel routes. Motorized travel routes include:

- roads
- motorized trails
- railroads, power lines, and pipelines
- lakes and streams where motorized use is allowed

Step 2

Non-motorized lands were classified as Semi-Primitive Non-Motorized (SPNM) by applying remoteness criteria. Areas more than ½ mile from all roads, railroads, motorized trails and waterways were initially mapped as semi-primitive, non-motorized.

Step 3

Housing density data from North Central Research Station was used to resolve inconsistencies based on social settings. When social and/or managerial settings are inconsistent with one another, a ROS category was selected that best represents current conditions.

Table 1 - Housing Density for ROS Classes

	Recreation Opportunity Spectrum Class					
	Primitive (P) (Wilderness)	Semi Primitive Non-Motorized (SPNM)	Semi Primitive Motorized (SPM)	Roaded Natural (RN)	Rural (R)	Urban (U)
Housing Unit Density*	n/a	n/a	0-11	12-42	43-331	332+

**Housing unit density is per square mile*

Step 4

Inconsistencies based on social and managerial settings were resolved using housing density data and professional judgment, concerning remoteness, social encounters, setting impacts, and scenic condition, to classify motorized lands as either Semi-Primitive Motorized (SPM) or Roaded Natural (RN). This is done by distinguishing between polygons surrounding roads of different maintenance levels, using the travel routes database, and field reviews.

Step 5

Motorized lands were classified as Roaded Natural, Rural, and Urban by using professional judgment and spatial data to resolve inconsistencies based on physical and managerial settings.

Step 6

SPN polygons were refined for further analysis by applying size criteria. Select areas are greater than or equal to 2,500 acres and a new shape file created for "SPN > 2500 acres". These areas were used in subsequent roadless area analyses.

Step 7

The map now depicts initial Semi-Primitive Non-Motorized and Semi-Primitive Motorized, Roaded Natural, Rural, and Urban areas used for effects analysis for ROS within EIS.

Step 8

GIS acres were totaled to determine current condition and amount of land under each ROS class.

Table 2 - Current ROS Inventory for Mark Twain National Forest

	Recreation Opportunity Spectrum Class					
	P (Wild)*	SPNM	SPM	RN	R*	U
Acres**	64,000	187,000	323,000	911,000	11,000	4

**Primitive includes land managed for specific objectives of wilderness; Rural includes land managed for specific objectives of developed recreation.*
*** ESRI ArcMap program used. Final map with acreages titled ROS-June2004.mxd*

Recreation Opportunity Objectives for Alternatives

The Forest Plan is built around the concept of management prescriptions. Each one defines and describes a desired condition for the future based upon proposed management of National Forest System lands. The ROS is a tool used to define recreation program objectives for each management prescription. ROS objectives are the same for all alternatives. The amount of land allocated to each management prescription may differ by alternative.

The following table show how ROS classes and management prescription relate.

Table 3 - Management Prescription by ROS Class

Primitive	Semi-primitive Non-motorized	Semi-primitive Motorized	Roaded Natural	Rural
5.1	6.1	1.2, 6.2	1.1	7.1

ROS objective for Management Prescriptions not shown

Under Management Prescription 6.3 (Candidate Rivers), ROS objectives are tied to classification of each river segment. Scenic river areas are under semi-primitive motorized class and recreation river areas under roaded natural.

Management Prescription 8.1 areas are usually smaller than one hundred acres and normally fall in the roaded natural class. In 8.1 areas with specific standards and guidelines, a different ROS class may be the objective and will be stated with the management direction. For example, National Recreation Trails are semi-primitive non-motorized part of the Spectrum.

ROS class objectives consider management prescription (MP) descriptions and alternative themes. Some MPs would have the same ROS class in all alternatives and some MPs differ based on the alternative theme. Mapping protocols are in Table ROS-7 of the FEIS. ROS objectives for alternatives were not a factor used in the vegetation model.

Project level planning will generally use ROS inventory criteria and objectives to determine how management activities are implemented.

For example, management activities in a MP 6.1 area may include:

- Closing some existing non-system roads if recommended as a result of the roads analysis,
- Gating roads that give access to private land,
- Constructing only temporary roads to harvest timber, and
- Emphasizing semi-primitive recreation activities and opportunities in the design of facilities such as hiking or biking trails, but no motorized uses.

Whereas under a roaded natural setting in MP 2.1 some of the same activities such as completing a roads analysis at the project level and use of temporary roads would be the same. Development of recreation facilities such as campground or motorized trails would be permitted and gates might not be required on private land accesses.

Appendix G

Fire Risk Assessment



Mark Twain
National Forest

Cover image: Controlled burn for fuels treatment

Photographer: Paul Nelson, Mark Twain National Forest

Appendix G

Fire Risk Assessment

Introduction

In 2000, the National Fire Plan was created to improve fire preparedness, reduce hazardous fuels, and reduce risks to communities among other objectives. Since its inception, the Mark Twain National Forest has increased its fuels program from less than 1,000 acres of fuel treatment per year to over 10,000 acres annually. Within the next 5 years the program may be treating over 40,000 acres per year. Identifying and prioritizing appropriate projects has required a collaborative effort among fire, fuels, wildlife and ecology staffs, as well as input from other federal, state and private cooperators. Emphasis was given in the development of the Fire Risk Assessment (FRA) to the reduction of hazardous fuels, restoration of fire-adapted ecosystems, and mitigation of potential risks to residents living in and around the Forest.

On the Mark Twain NF a system was needed that would enable managers to identify and prioritize areas for treatment and active management, as well as identify areas of low risk to residents where aggressive suppression activities could be reduced and appropriate suppression responses may be practiced. There was also a need to effectively focus fire prevention and community outreach efforts.

Development of the Fire Risk Assessment (FRA)

The Forest convened a meeting on March 11, 2003 to further refine a risk assessment initiated in 1993 by Mike Schanta and Lyn Carpenter. The original assessment looked at fire occurrence, structure locations, fuels characteristics and potential fire behavior. Attending the March 11, 2003 meeting were Margaret Olson, Marvin Dablemont, Galen Johnson, Bennie Terrell, and Lyn Carpenter. The group discussed the following items:

Fuel Model Flammability (Hazard)

Characteristics of High Hazard

- High flammability
- High potential for crowning
- Great resistance to control
- Continuous fuel bed
- High rates of spread
- High spotting potential

Characteristics of Moderate Hazard

- Fuel Models 5 and 6
- Less available fuels
- Little or no spotting potential
- Little crown fire potential

Structure Density

- Interface is defined as 3 or more structures per acre.
- Intermix is defined as 1 structure per forty acres.

Fire Occurrence Density

- Baseline data will start at 4 fires per square mile.

Point System for Risk Factors

The original idea for the risk assessment came from a model used in Canada. Margaret Olson developed a model for the Forest patterned after the Canadian model. We identified seven risk factors, and then Olson assigned a point system for the risk factors that was compatible to the model.

In order to make the point system as simple as possible, a classification was developed that totaled one hundred points for all risk factors. The following weighting process was developed by dividing up the points so risk factors with the greatest impact on severity of an ignition, have the greatest individual totals.

Table 1 - Wildland Urban Interface (WUI) - 25 Total Points

Risk	Description	Definition	Points
High	Wildland Urban Interface (WUI)	≥ 3 structures / acre	15
Medium	Intermix Moderate	≥ 1 structures / 40 acres	8
Low	Intermix Low	< 1 structures / 40 acres	2

The WUI density range was changed to match those used in the Haight, et al. study for standardization purposes, and ease in conversion of data. Low and very low categories were combined into low.

Table 2 - Historic Ignition Point Densities - 16 Total Points

Risk	Definition	Points
High	10-15/ square mile	10
Medium	2-10/square mile	5
Low	< 2/square mile	1

Table 3 - Fuel Models - 16 Total Points

Risk	Definition	Points
High	FM 1, 2, 11, 12	10
Medium	FM 5, 6	5
Low	FM 8, 9, 10	1

Table 4 - Response Time - 16 Total Points

Risk	Definition	Points
High	> 1 hour	10
Medium	30 min to 1 hour	5
Low	< 30 minutes	1

Table 5 - Potential Ignition Proximity to Interface - 15 Total Points

Risk	Definition	Points
High	< ¼ mile	9
Medium	¼ to 1 mile	5
Low	> 1 mile	1

Table 6 - Potential Ignition Proximity to Infrastructure Developments - 6 Total Points

Risk	Definition	Points
High	< ¼ mile	3
Medium	¼ to 1 mile	2
Low	> 1 mile	1

Table 7 - Potential Ignition Proximity to Threatened and Endangered Species Sites* - 6 Total Points

Risk	Definition	Points
High	< ¼ mile	3
Medium	¼ to 1 mile	2
Low	> 1 mile	1

** T&E sites only considers known gray and Indiana bat caves at this time. Remove green shading*

Point Ranges

If a cell received a 'High' ranking in all 7 risk factors, the highest possible score is 60 points. A rating of 'Moderate' in all 7 risk factors would be 32 possible points. A 'Low' rating on all factors would equal 8 possible points, all totaling 100 points.

After the seven grids were applied to each pixel and combined (arithmetic overlay), the total actual points ranged from 2 to 47, out of a possible 100 points.

Determining break points, the point where each class changed to the next class, for high, medium, and low presented a problem. There were no statisticians available to help at this point in the development of the assessment. Olson used the equal interval method of distribution, which generated: 2-17 points for low risk, 18 to 34 points for moderate risk, and 35 to 47 points for high risk. At this point the assessment was sent to Dave Cleland, research ecologist for the Forest Service, with the sole purpose of validating the point system and point distribution of low, medium, and high.

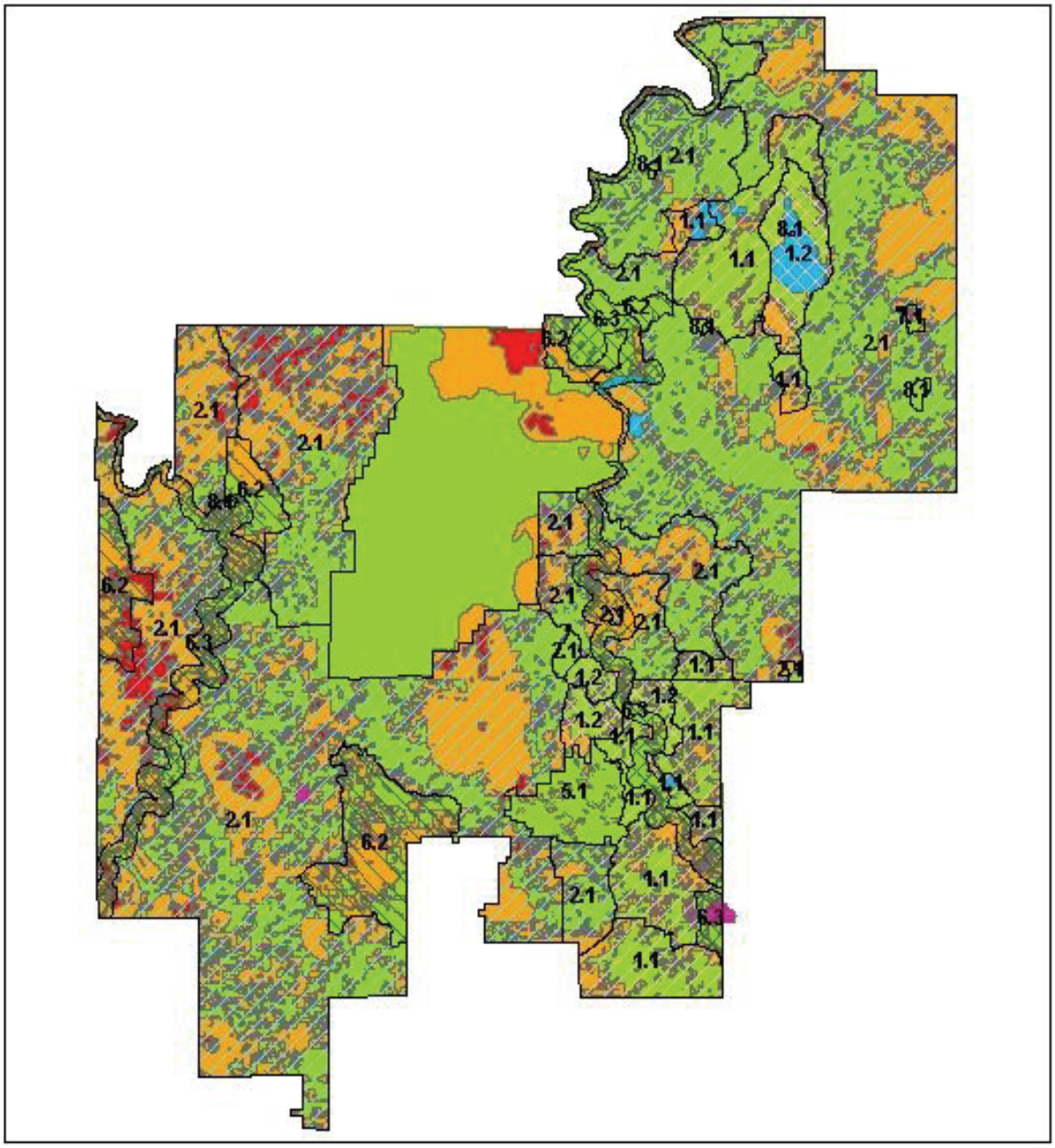
Dave made the following significant statements:

- The point system and overall model is valid.
- It is appropriate to manipulate the point distribution (adjustment of break points).
- The model is considered an expert model, not a mathematical model. (Many criteria decisions made by the Fire Management Advisory Group, such as break points for high, medium, and low for seven risk factors are based on experience or expert opinion.

Adjustments were made to the equal interval point distribution because the initial distribution did not adequately represent "High", or the risk immediately around structures. Schanta and Carpenter adjusted the distribution, using their professional judgment, until "High" and the area around structures was more accurately represented. The corrected redistribution was 2-15 points for Low risk, 16-25 points for Moderate risk, and 25 to 47 points for High risk.

The following figures show the resulting fire risk to communities and community infrastructure for each of the Mark Twain NF units.

Figure 1 - Houston - Rolla Unit

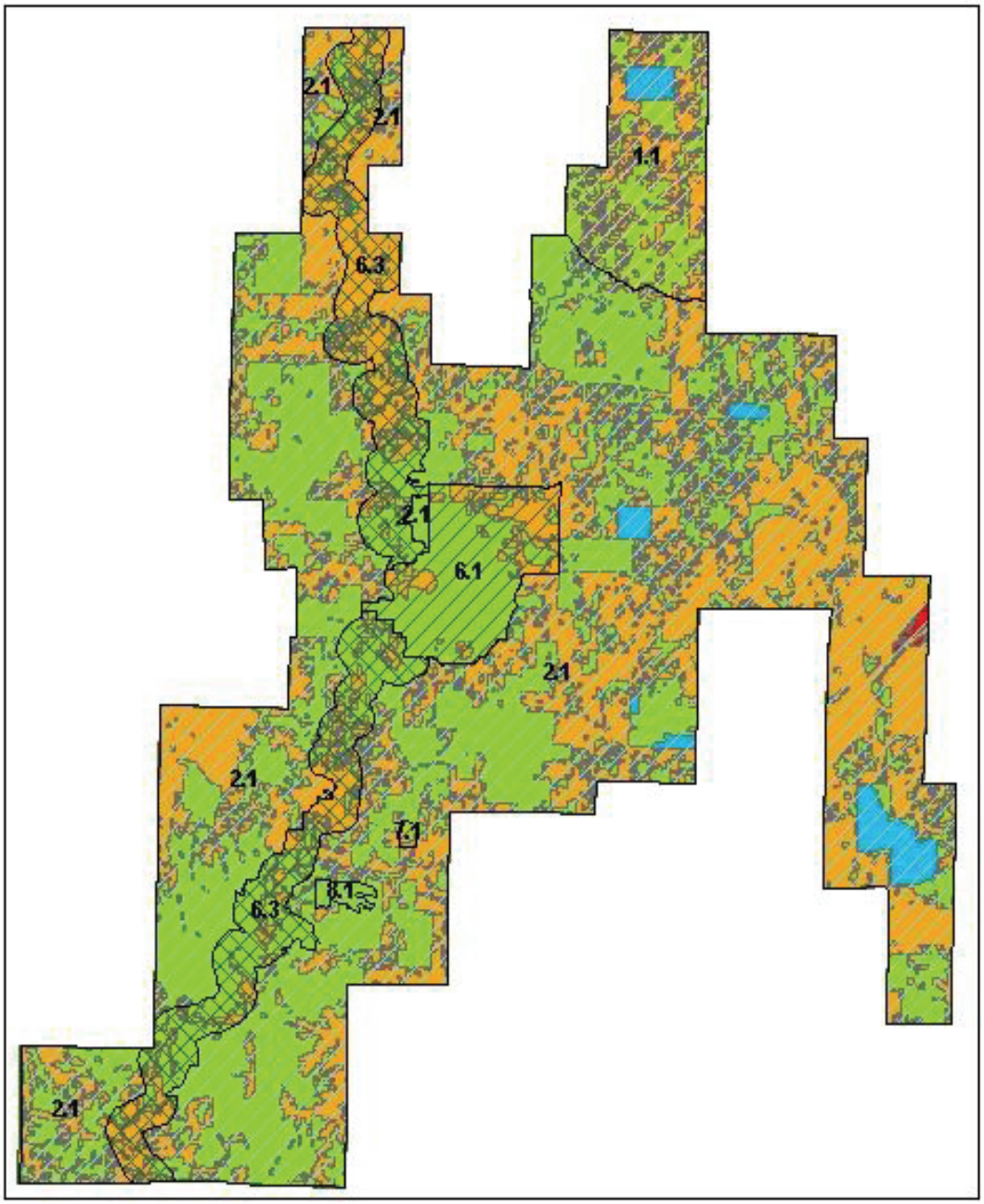


Note: Forest Plan Management Prescriptions for the selected alternative are shown

Legend

High Risk (25 – 47 Points)	
Moderate Risk (16 – 25 Points)	
Low Risk(2 – 15 Points)	
Wildfires 2000 – 2003	
Prescribed Fires 2000 – 2003	

Figure 2 - Cedar Creek Unit

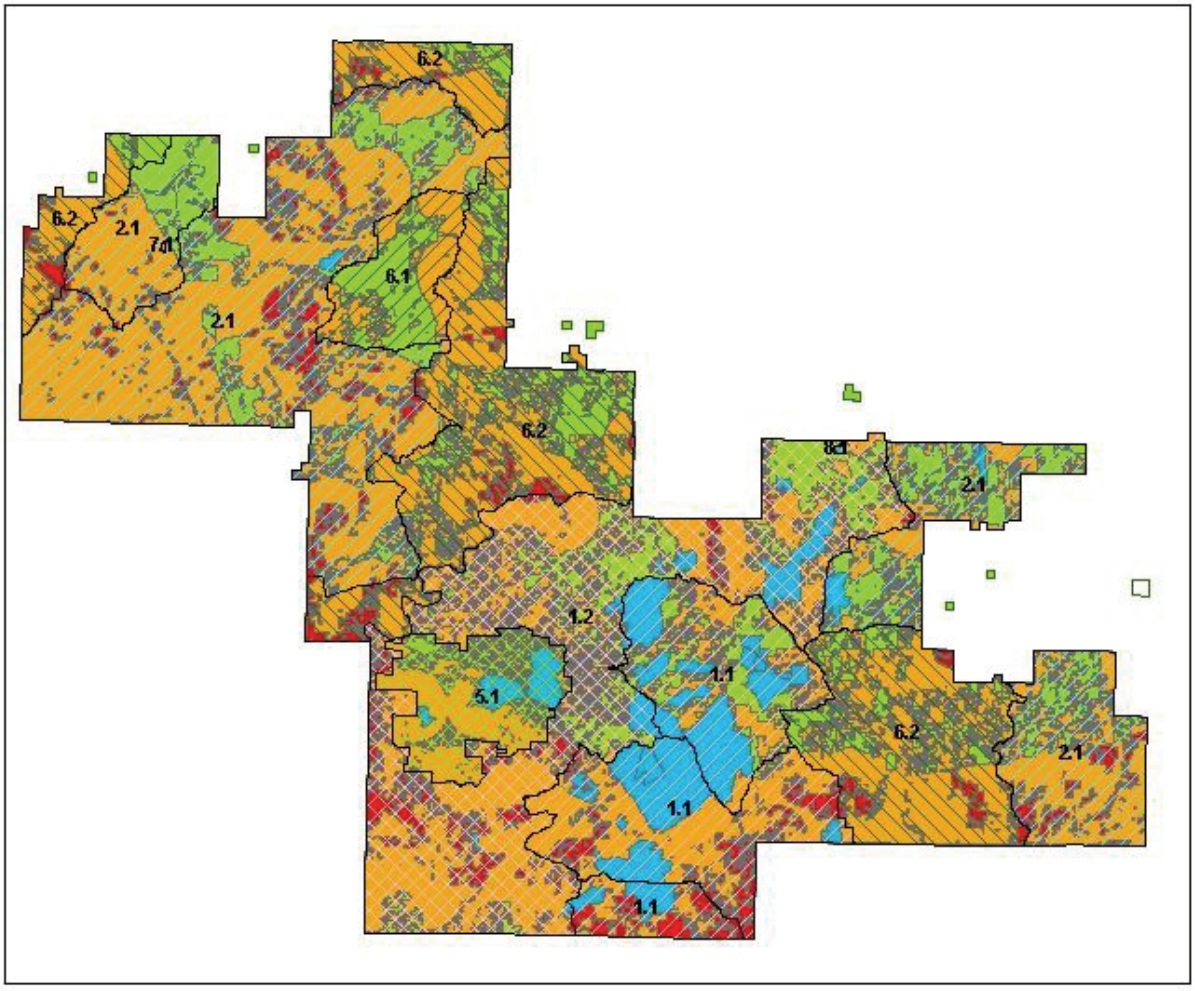


Note: Forest Plan Management Prescriptions for the selected alternative are shown

Legend

High Risk (25 – 47 Points)	
Moderate Risk (16 – 25 Points)	
Low Risk(2 – 15 Points)	
Wildfires 2000 – 2003	
Prescribed Fires 2000 – 2003	

Figure 3 - Ava Unit

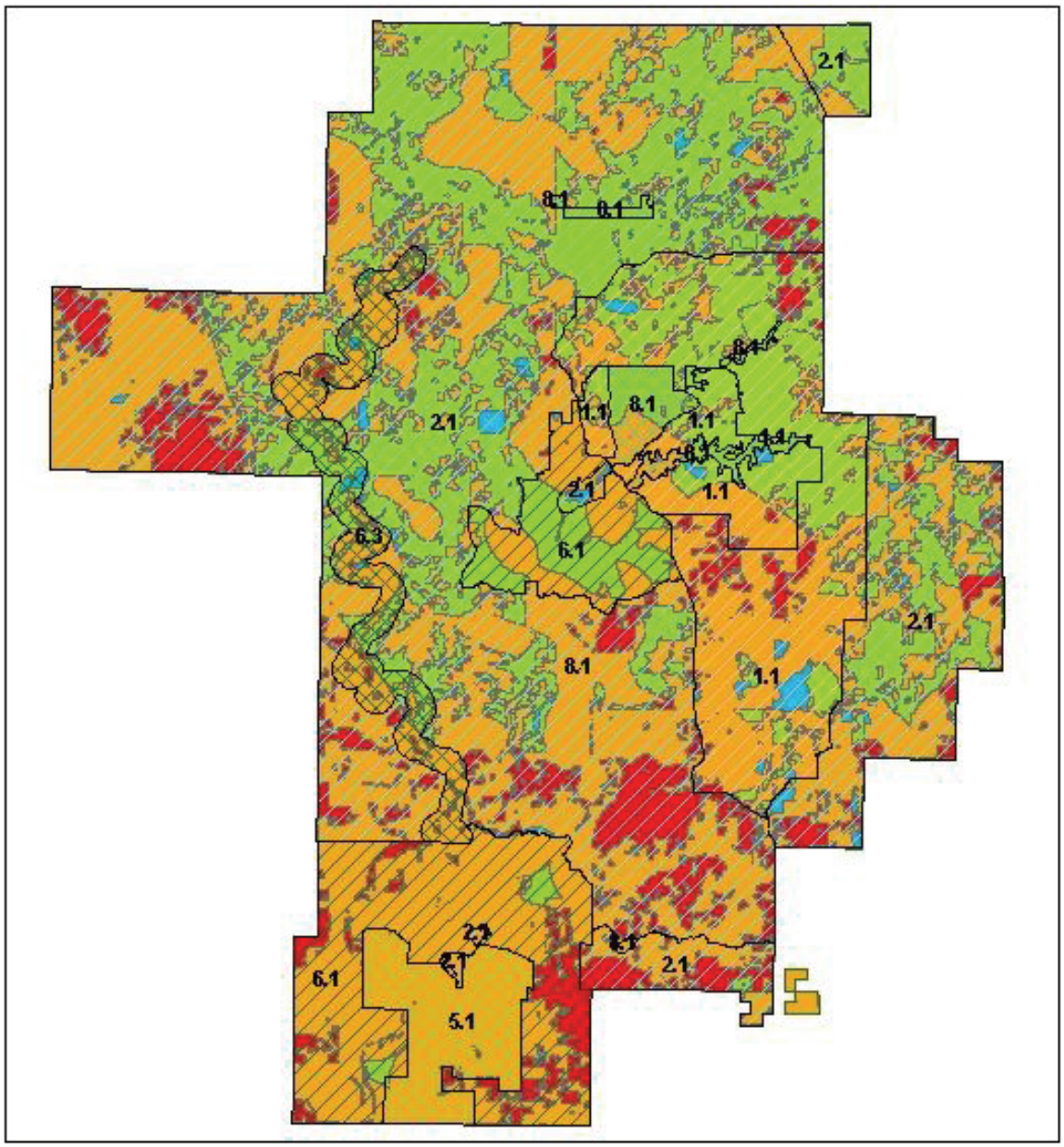


Note: Forest Plan Management Prescriptions for the selected alternative are shown

Legend

High Risk (25 – 47 Points)	
Moderate Risk (16 – 25 Points)	
Low Risk(2 – 15 Points)	
Wildfires 2000 – 2003	
Prescribed Fires 2000 – 2003	

Figure 4 - Willow Springs Unit

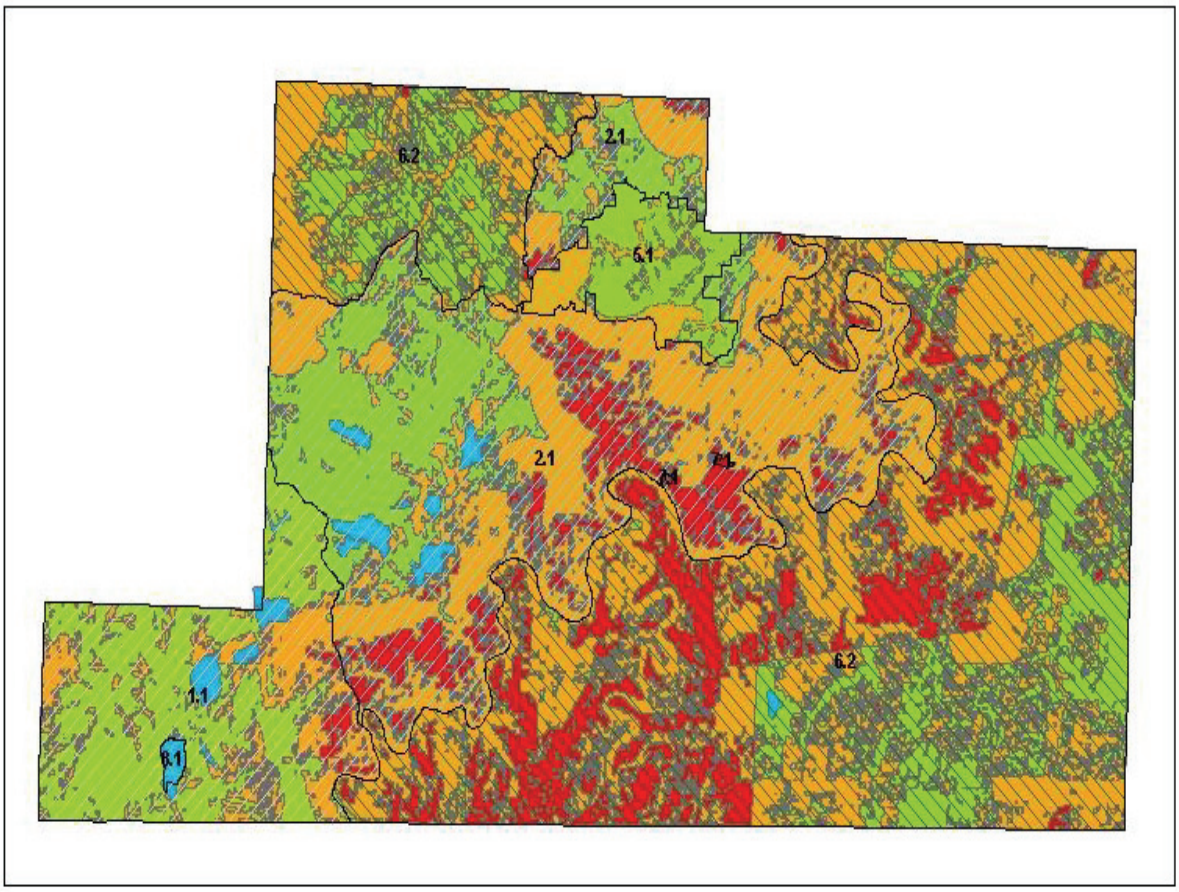


Note: Forest Plan Management Prescriptions for the selected alternative are shown

Legend

High Risk (25 – 47 Points)	
Moderate Risk (16 – 25 Points)	
Low Risk(2 – 15 Points)	
Wildfires 2000 – 2003	
Prescribed Fires 2000 – 2003	

Figure 5 - Cassville Unit

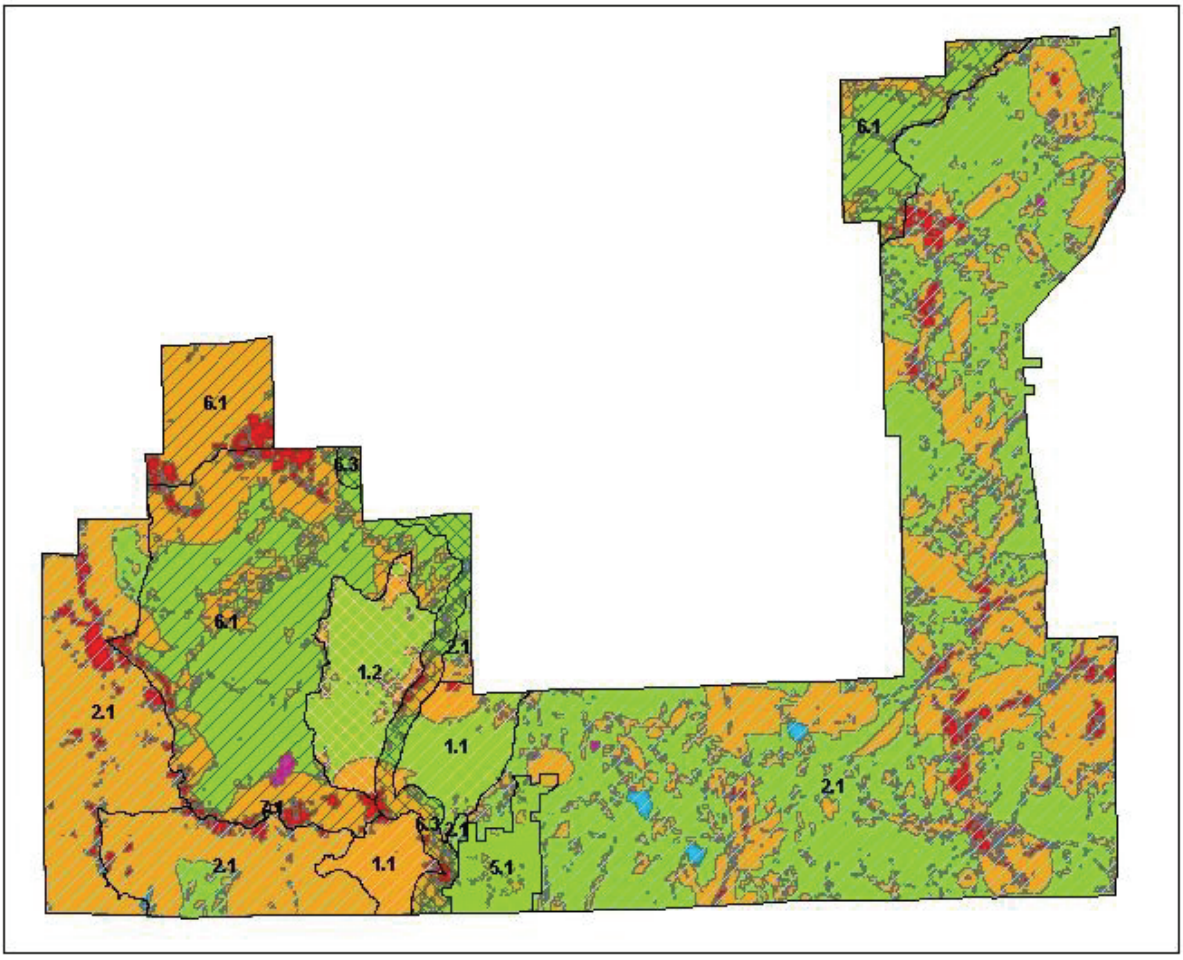


Note: Forest Plan Management Prescriptions for the selected alternative are shown

Legend

High Risk (25 – 47 Points)	
Moderate Risk (16 – 25 Points)	
Low Risk(2 – 15 Points)	
Wildfires 2000 – 2003	
Prescribed Fires 2000 – 2003	

Figure 6 - Fredericktown Unit

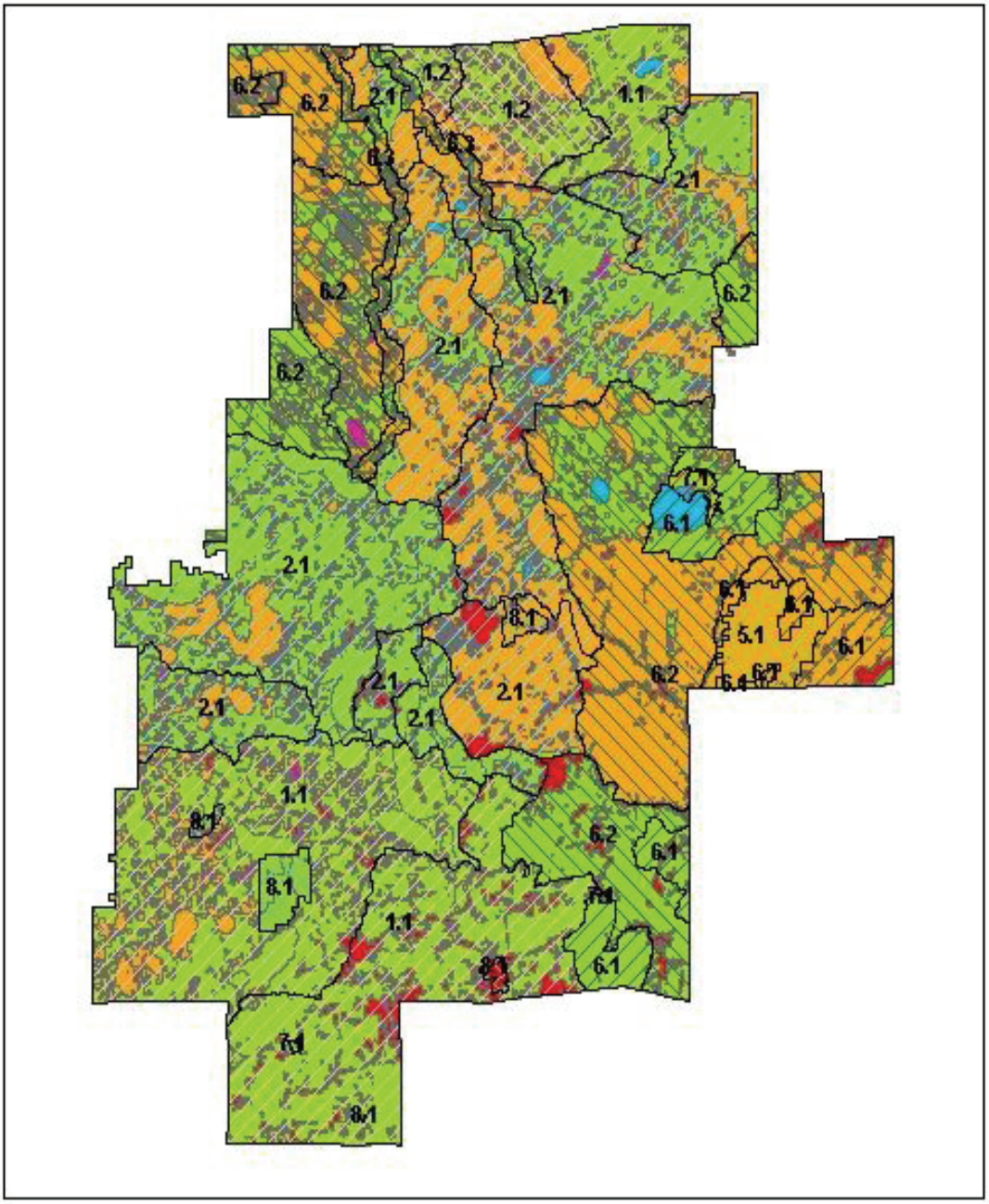


Note: Forest Plan Management Prescriptions for the selected alternative are shown

Legend

High Risk (25 – 47 Points)	
Moderate Risk (16 – 25 Points)	
Low Risk(2 – 15 Points)	
Wildfires 2000 – 2003	
Prescribed Fires 2000 – 2003	

Figure 7 - Salem and Potosi Units

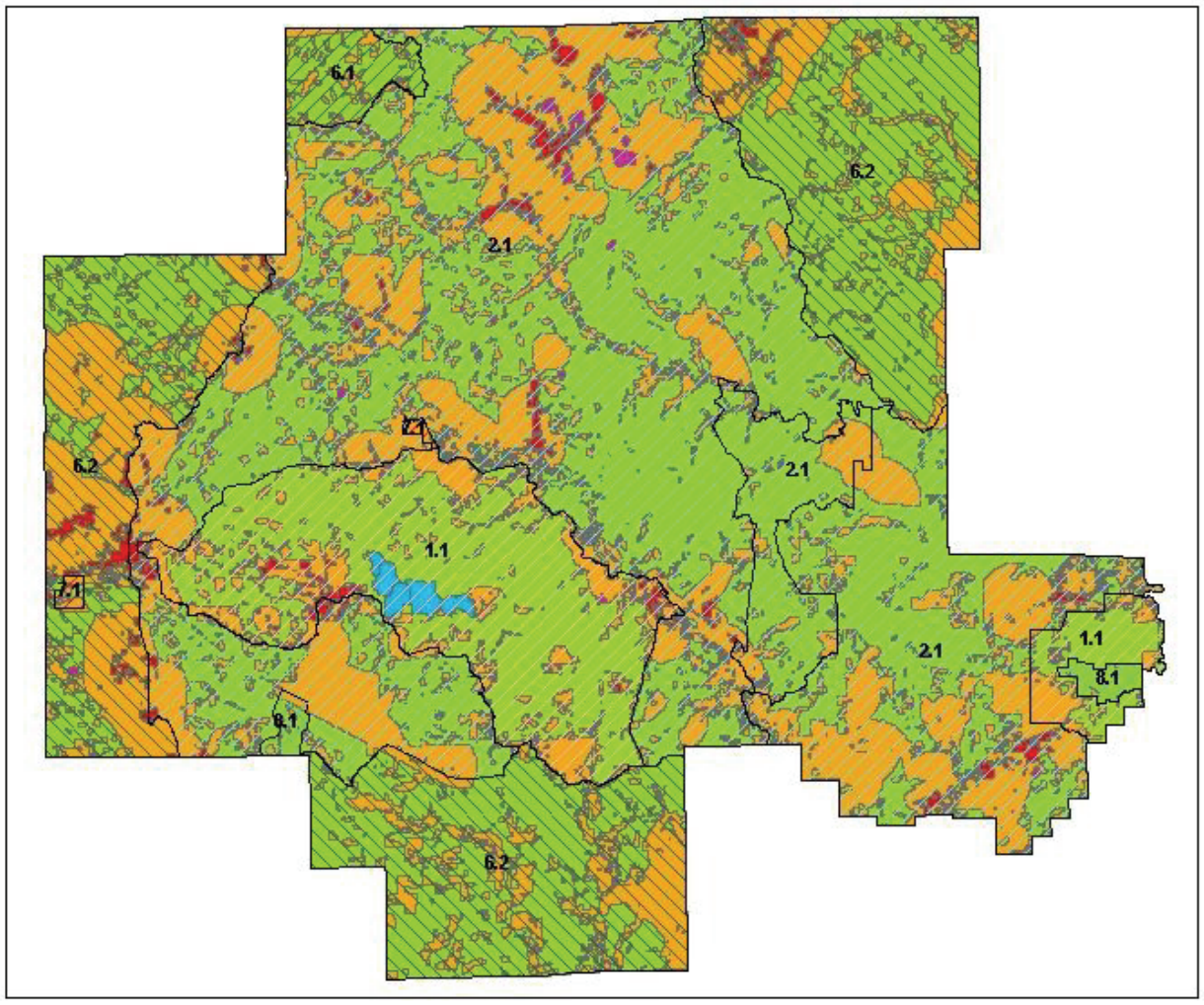


Note: Forest Plan Management Prescriptions for the selected alternative are shown

Legend

High Risk (25 – 47 Points)	
Moderate Risk (16 – 25 Points)	
Low Risk(2 – 15 Points)	
Wildfires 2000 – 2003	
Prescribed Fires 2000 – 2003	

Figure 8 - Poplar Bluff

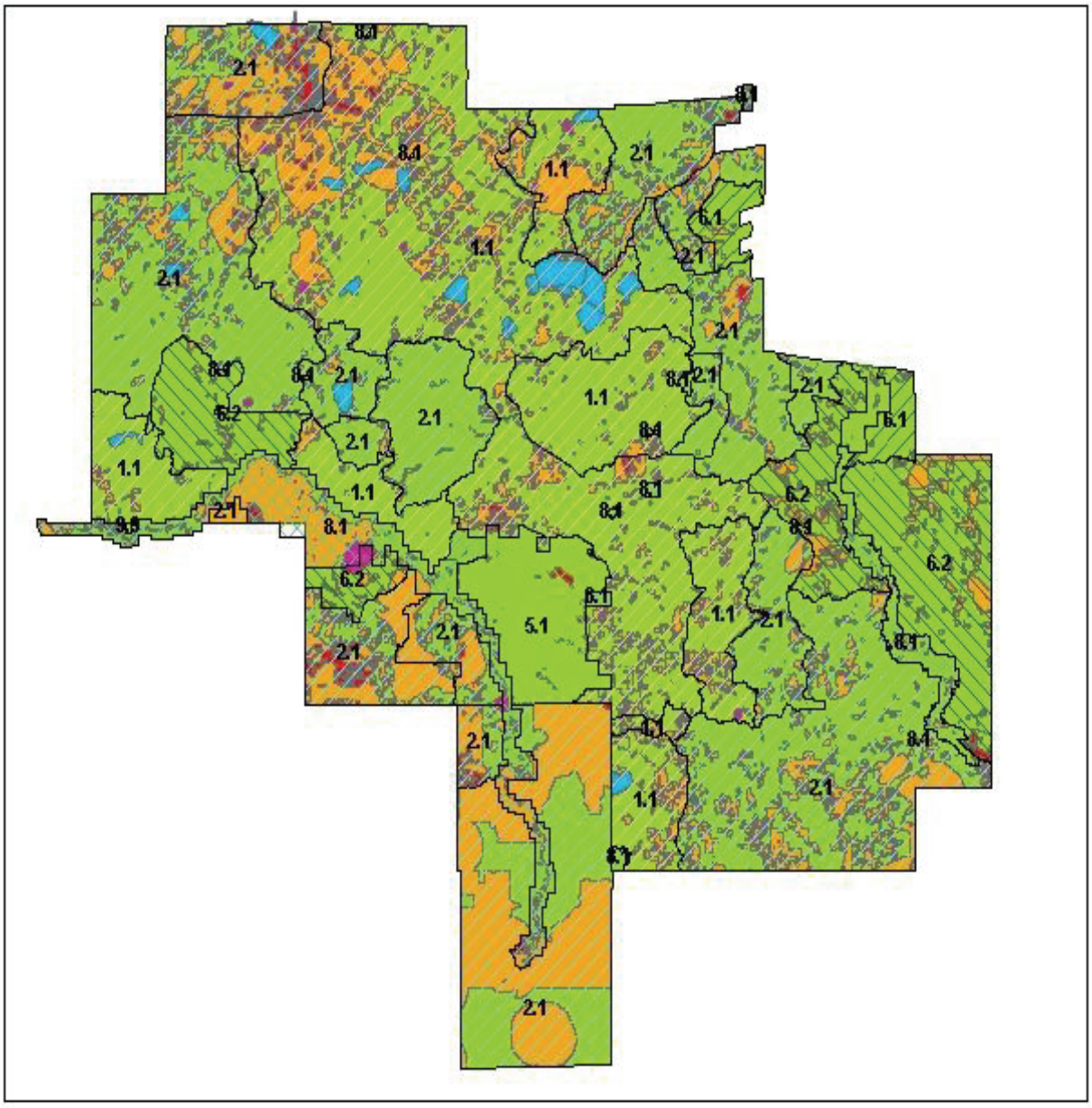


Note: Forest Plan Management Prescriptions for the selected alternative are shown

Legend

High Risk (25 – 47 Points)	
Moderate Risk (16 – 25 Points)	
Low Risk(2 – 15 Points)	
Wildfires 2000 – 2003	
Prescribed Fires 2000 – 2003	

Figure 9 Doniphan/Eleven Point Unit



Note: Forest Plan Management Prescriptions for the selected alternative are shown

Legend

High Risk (25 – 47 Points)	
Moderate Risk (16 – 25 Points)	
Low Risk(2 – 15 Points)	
Wildfires 2000 – 2003	
Prescribed Fires 2000 – 2003	

Use of the Risk Assessment

The Fire Risk Assessment (FRA) can be used:

- as a guide to identify where fuels reduction projects are needed.
- to identify projects needed to prevent fire from entering high risk areas,
- to preposition suppression resources for initial attack,
- to determine where modified suppression responses may be best utilized,
- to locate areas best suited for wildland fire use,
- to "target" private landowners and communities for participation in Firewise or other prevention programs.

Fuels Reduction Projects

The highest priority for hazardous fuels treatments should be areas that are designated "High" or "Moderate" risk, in Management Areas 1.1 and 1.2. The next priority should be areas that are designated "High" or "Moderate" risk, in all other management areas. Planning hazardous fuels projects in areas designated as "Low" risk may be considered if those projects are imperative to keep fire out of high and moderate risk areas.

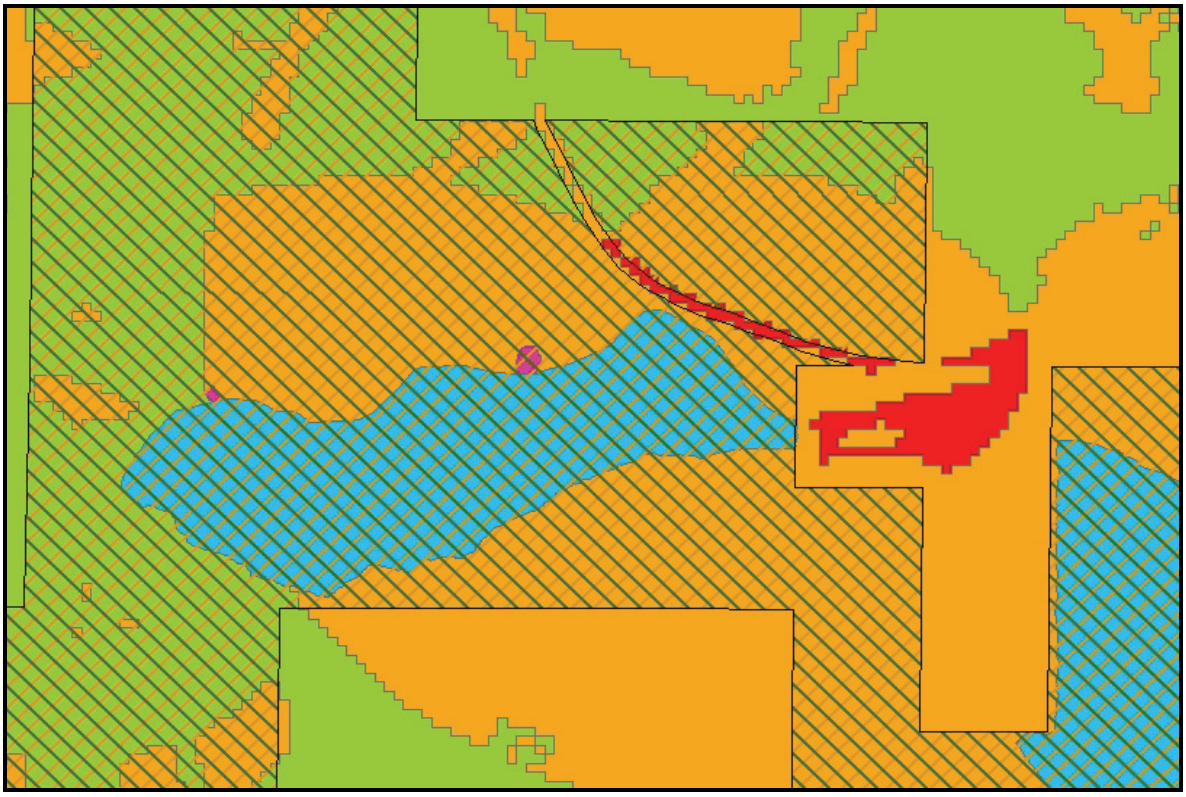
Other examples where low risk areas may be treated:

- Inclusions or fingers of Low risk surrounded by High or Moderate risk,
- an area of Low risk lies between a natural or manmade barrier and an area of High or Moderate risk,
- an area of Low risk is included in an area of High and Moderate risk to make a logical burn unit.

Projects specifically designed to reduce hazardous fuels in low risk areas should not be considered unless they meet one or more of the previous criteria.

To illustrate the appropriate location of projects, the following graphic (Figure 10) was clipped from Management Area 1.1 on the Doniphan/Eleven Point District. Prescribed fires were accomplished in areas of Moderate risk in Forest Service ownership. The graphic displays a history of wildland fire and an area of High risk in the same immediate location, on private land. Low risk was included in the project to make a logical burn boundary. Looking at projects at this resolution leads to the question of why burns were not planned to include more acres or a larger area. There also appears to be an opportunity to do hazardous fuels reduction projects on private land in cooperation with the Missouri Department of Conservation using Stevens/Wyden Act funding.

Figure 10 - Sample Use of Risk Assessment in Project Planning



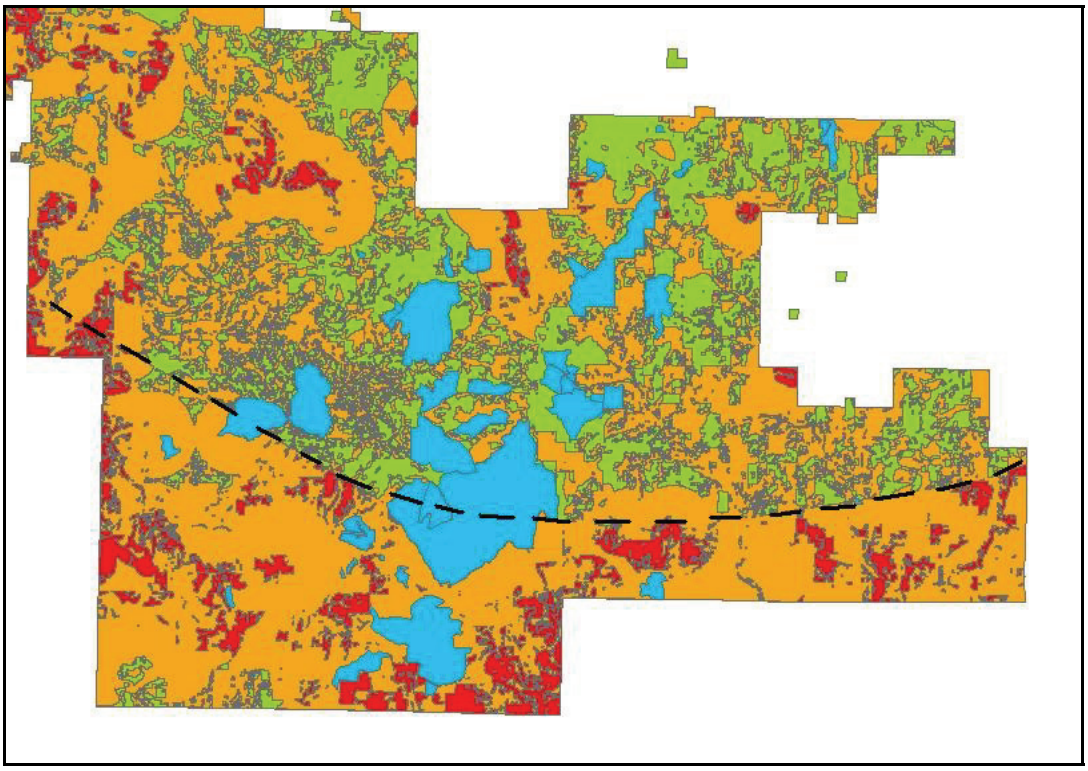
Legend

High Risk	
Moderate Risk	
Low Risk	
Historic Wildfires	
Accomplished Prescribed Fires	
FS Ownership	

Locating Initial Attack Suppression Resources

Two critical elements of the FRA are historic ignition points and response times. A study of these factors can show the need to move traditional standby locations or staging areas to improve response times and reduce risk. A good example is the Ava unit of the Ava/Cassville/Willow Springs Ranger District. There is an arc of Moderate risk running approximately from Hercules Glades east, to south of Thornfield Mo. (See Figure 11). While there are concentrations of structures in this area, much of the risk is generated by the response time from Ava, which is in the far NE corner of the graphic. By locating suppression resources south of Ava, some risk could be reduced. If moving resources south of Ava is not practical, other mitigation measures such as fuel reduction treatments need to be considered.

Figure 11 - Response Time Arc



Suppression Strategies

- In conducting wildland fire suppression, responsible officials shall give priority to the safety of firefighters, other personnel, and the public. Consistent with this priority, responsible officials shall conduct wildland fire suppression in a timely, effective and efficient manner. (FSM 5130.3)

An important goal of the Fire Risk Assessment is to ensure the intent of FSM 5130 is executed by offering a tool to decrease response time and increase efficiency. As areas of the Forest experience growth of the wildland urban interface, or more commonly the wildland intermix or rural interface, additional measures may need to be taken to protect structures and communities at risk. Aggressive suppression action must be taken in areas of High risk and to a somewhat lesser degree in areas of Moderate risk. As mentioned above, the location of suppression resources needs to be such that response times to areas of High risk are reduced to an acceptable level.

- In making decisions about how to organize and conduct suppression operations, line officers shall minimize both suppression cost and resource loss consistent with the resource management objectives for the values to be protected and shall consider fire behavior, the availability of suppression resources, the values of the natural resources and property at risk, direction in the Forest land and resource management plan, and the potential cost of suppression. (FSM 5130.3)
- The primary criteria for choosing fire suppression strategies and tactics are to ensure the safety of the public and the firefighting resources while minimizing suppression costs, resource loss, environmental damage, and the threat of wildland fire escaping onto non-Federal lands. (FSM 5130.3)

- Unit managers shall ensure that a cost-effective initial attack on any human-caused ignition is conducted. And, under no circumstances are suppression strategies and tactics tailored to achieve resource benefits. (FSM 5130.3)
- The selection of less aggressive containment strategies in areas of minimal potential negative impacts is appropriate if it determined to be the safest and least-cost alternative. (FSM 5130.3)

Based on these manual references, areas identified as Low risk may present opportunity for a reduced or less aggressive suppression strategy based on current and expected fire behavior. In practical terms, it may be more cost effective, and safer, to allow a fire to burn an extra 500 acres allowing the use of natural barriers, as opposed to using personnel, equipment, and time to construct firelines.

Items that must be considered by line officers and fire managers when considering less aggressive strategies include:

- Completion of a Wildland Fire Situation Analysis (WFSA); especially if more than one burning period is expected for control (FSM 5131.10).
- Current and predicted weather conditions
- Current and predicted fire behavior
- Potential for resource damage as a result of 1) the fire and, 2) suppression activities including fireline construction.
- Areas designated High or Moderate risk in the potential path of the fire, and the current Rate of Spread
- Smoke management
- Firefighter and public safety
- Resource Availability
- Firefighter Fatigue
- When a fire is person caused and there is a realistic expectation of billing the individual responsible for starting the fire, overall cost of the fire (suppression plus resource damage) must be a consideration.

Wildland Fire Use

Only natural ignitions are allowed for wildland fire use for resource benefits. Lightning is the only natural ignition that occurs on the Mark Twain National Forest. Over the last ten years, the Forest has had an average of 1.8 lightning fires per year. While the occurrence of lightning fires is infrequent, it does represent an opportunity for ignition. The fire risk assessment is a tool to help identify those areas of low risk where wildland fire use would be an appropriate management response. Possible candidate areas are the seven Wildernesses and other large, remote areas of low risk.

WFU Considerations:

- The Mark Twain National Forest Plan must approve Wildland Fire Use.
- The Fire Management Plan (FMP) must establish Fire Management Units, which would most likely follow Zone boundaries.
- A Maximum Manageable Area (MMA) will need to be established.
- A Wildland Fire Implementation Plan (WFIP) would need to be developed when the go/no-go decision leads to wildland fire use.

The purpose of giving managers the ability to select appropriate management response on every wildland fire is to provide the most responsible decision based on ecological, social and political factors, and the greatest flexibility possible to achieve greater balance in the program. To clarify the full range of options available under appropriate management response, the following figure utilizes four variables to illustrate development of an appropriate management response.

Management Responses to Wildland Fire

Figure 12 - Appropriate Management Response Matrix

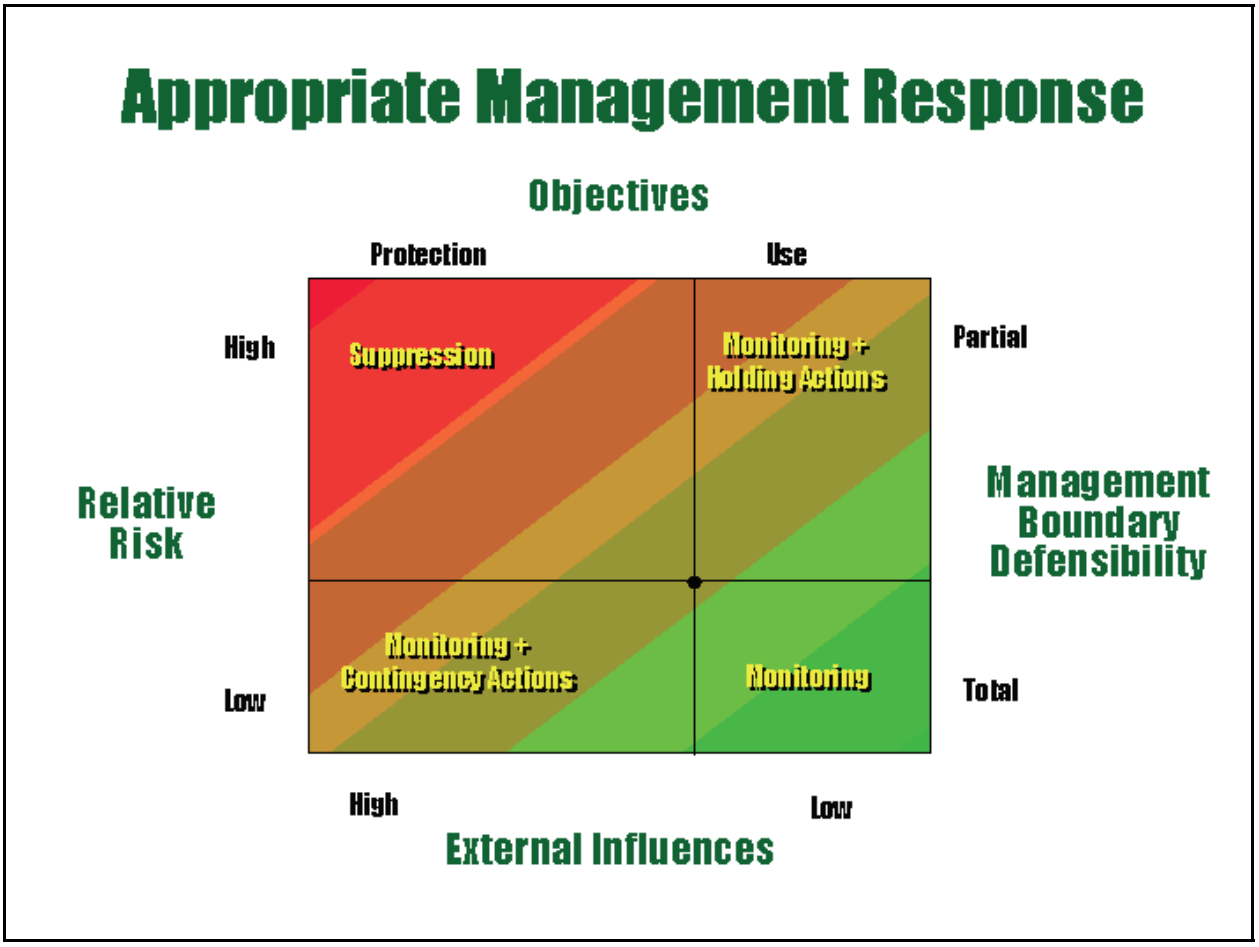


Figure 12 can be used to estimate appropriate methods to implement desired or necessary strategies. To obtain this estimate, lines must be drawn to connect top and bottom variables and left and right variables. At the intersection of two lines is a potential management response for the defined conditions. For the example in Figure 12 the appropriate management response would be Monitoring and Contingency Actions.

For those situations indicating a suppression response, a range of responses dealing with only suppression actions is available. The following chart illustrates how the range of appropriate suppression management responses can vary.

Figure 13 - Range of Appropriate Suppression-Oriented Responses

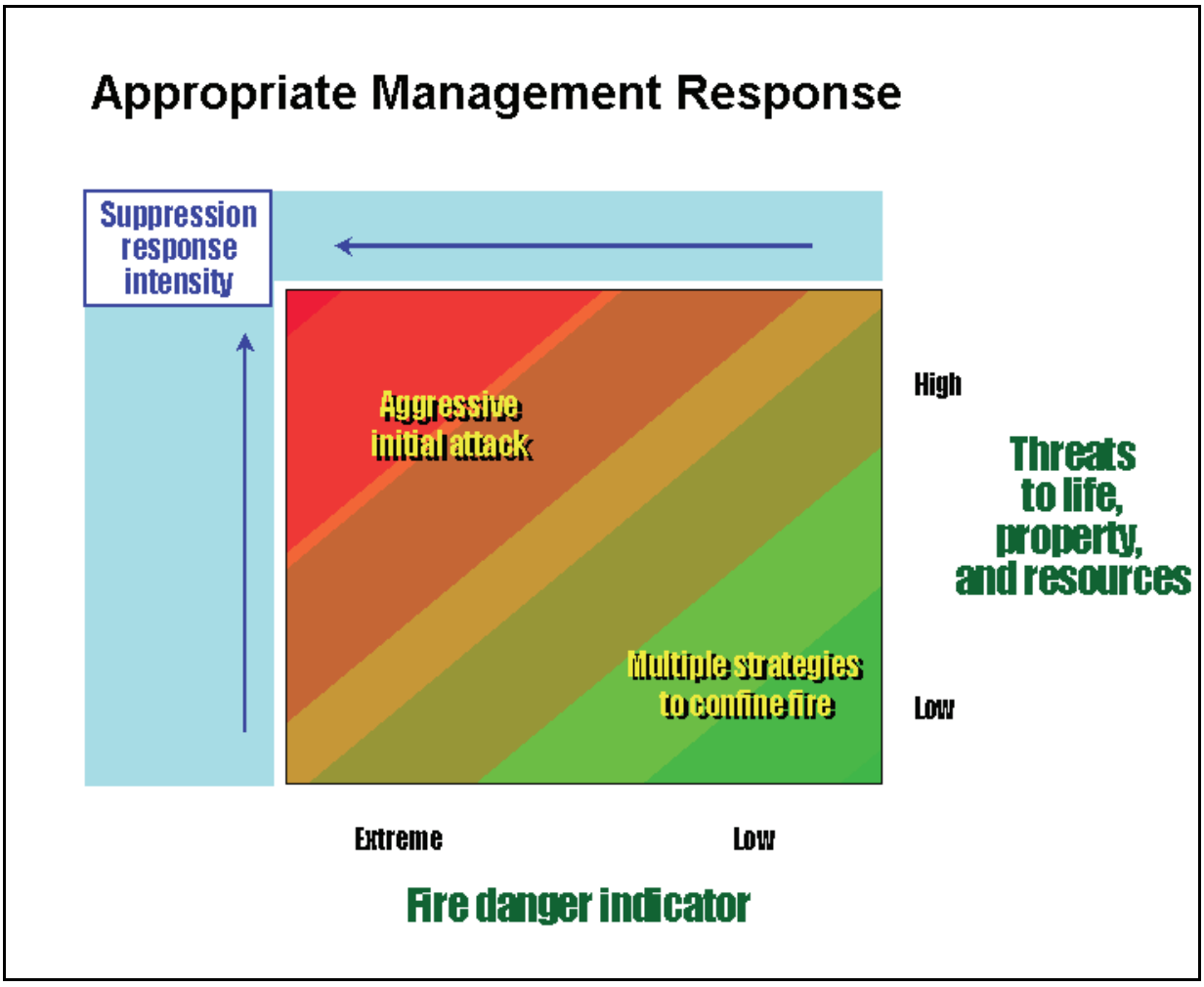
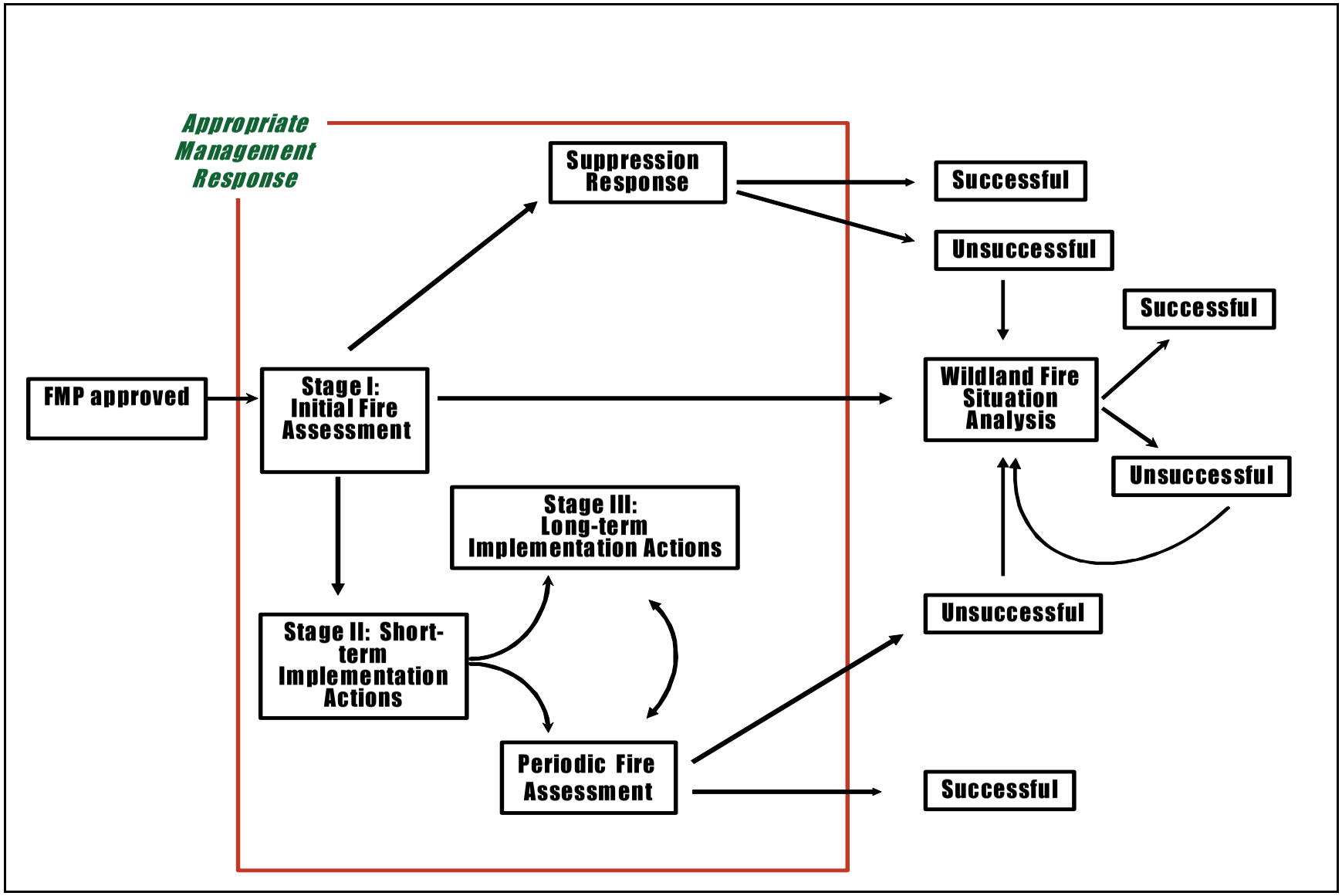


Figure 14 - Management Response Flowchart



Stage I, II, and III, come directly from the Wildland Fire Implementation Plan (WFIP) (FSM 5130). The WFIP is a progressively developed assessment and operational management plan that documents analysis and selection of strategies and describes appropriate management response for a wildland fire. A full WFIP consists of three stages. See Figure 15 below.

Figure 15 - WFIP Implementation Stages, Requirement Status and Completion Timeframes

WFIP Stage	Planning and Assessment Element	Requirement Status* Initial Attack	Other Suppression-oriented appropriate management responses	Fire use actions	Maximum completion timeframe
WFIP Stage I: Initial Fire Assessment	Fire Situation	1	1	1	As soon as possible
	Decision Criteria Checklist (Initial GO-NO-GO Decision)	3	1	1	2 hours after first fire detection
WFIP Stage II: Short-term Implementation Actions	Short-Term Fire Behavior Predictions and Risk Assessment	3	1	1	24 hours after Stage I completion
	Short-term Implementation Actions	2	1	1	
	Complexity Analysis	3	1	1	
	Stage III Need Assessment Chart	NA	1	1	
WFIP Stage III: Long-Term Implementation Actions	MMA Definition	3	4	4	Within 24 hours after Stage II or Periodic Fire Assessment indicates need
	Fire Behavior Predictions	3	4	4	
	Long-Term Risk Assessment	3	4	4	
	Long-term Implementation Actions	3	4	4	
Periodic Fire Assessment	Part 1: Re-validation	NA	1	1	On assigned frequency
	Part 2: Stage III Need Assessment Chart	NA	1	1	
WFSA		5	5	6	Before implementing new strategy

Requirement status key

1 = mandatory

2 = mandatory, but can be preplanned

3 = optional

4 = completed if Stage II or Periodic Fire Assessment, Part 2 indicate need.

5 = completed if fire exceeds management capabilities

6 = completed if Periodic Fire Assessment, Part 1 indicates need

For additional information please refer to "Wildland and Prescribed Fire Management Policy, Implementation Procedure Reference Guide. It can be found at: http://www.fs.fed.us/fire/fireuse/wildland_fire_use/ref_guide/index.html

Prevention

Historically prevention efforts have been concentrated on schools, parades, and special events. Utilizing the FRA, managers can target prevention efforts in areas of high risk where there are communities and/or individual structures at risk. Materials such as "Living with Wildfire: How to assess your property and decrease the chance of wildfire damage to your home" (MDC), could be distributed to "at risk" areas by bulk mailings or during personal visits. During periods of high fire danger, prevention teams could accomplish site visits and offer evaluations

Community Protection Plans

The idea of community-based fire planning and prioritization is neither novel nor new. However, the incentive for communities to engage in comprehensive fire planning and prioritization was given new and unprecedented impetus with enactment of the Healthy Forests Restoration Act (HFRA) in 2003.

This landmark legislation includes the first meaningful statutory incentives for the US Forest Service (USFS) and the Bureau of Land Management (BLM) to give consideration to priorities of local communities as they develop and implement forest management and hazardous fuel reduction projects.

In order for a community to take full advantage of this new opportunity, it must first prepare a Community Wildfire Protection Plan (CWPP).

The HRFA provides communities with a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands and how additional federal funds may be distributed for projects on non-federal lands. A CWPP is the most effective way to take advantage of this opportunity.

The minimum requirements for a Community Wildfire Protection Plan as described in the HFRA are:

- Collaboration: In consultation with federal agencies and other interested parties, local and state government representatives must collaboratively develop a CWPP. ,.
- Prioritized Fuel Reduction: A CWPP must identify and prioritize areas for hazardous fuel reduction treatments and recommend the methods of treatment that will protect one or more at-risk- communities and essential infrastructure. The FRA is the perfect tool to help communities with the identification and prioritization of proposed projects.
- Treatment of Structural Ignitability: A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.

Mark Twain National Forest Contributors to Fire Risk Assessment

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Jody Eberly	Wildlife Program Manager
Marvin Dablemont	Fire Management
Paul Nelson	Fire Ecologist
Lyn Carpenter	Fire Management/Assessment Development

Appendix H

FEIS Index



Mark Twain
National Forest

Cover image: Morgan Spring Branch

Photographer: Randy Long, Mark Twain National Forest

Appendix H

FEIS Index

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