

RESPONSE TO MANAGEMENT PROBLEMS, ISSUES, CONCERNS AND OPPORTUNITIES

INTRODUCTION

The first step in the planning process is to identify public issues, management concerns, and resource use and development opportunities. This evaluation is based on the current management direction of the Mark Twain National Forest. A primary objective of the Forest Plan is to resolve as many of the issues, concerns and opportunities as possible. The maximizing of net public benefits from the Forest and the attainment of other objectives is sought in this planning process.

Solutions to the issues and concerns are achieved in two ways. One is by issuance of policy statements as standards and guidelines (see Chapter IV). The other is by allocation of management prescriptions to specific areas of the Forest. Management prescriptions specify management intensities by identifying practices and their timing for application to the Forest landscape. These management prescriptions are designed to produce specific forest conditions. These conditions, in turn, produce specific outputs of goods, services, and enhancements. These results resolve those public issues related to the allocation of land to particular uses.

MANAGEMENT PROBLEMS, PUBLIC ISSUES AND MANAGEMENT CONCERNS

The issues, concerns and opportunities were formulated into ten management problems. A management problem is a statement expressing conflicting values about the desired condition or management of the Forest. See FEIS Appendix A for a complete description of the management problems. Also, FEIS Response Appendix A-1 displays public comment concerning the draft planning documents and Forest Service responses. The Forest Plan resolves the management problems as follows.

National Forest Land Base - Management Problem 1

This problem involves issues and concerns such as the high fixed cost of land ownership, scattered National Forest tracts, and limited or no public access to some tracts. They can be resolved or mitigated through Forest Service land adjustment programs. This Plan directs a major shift from land acquisition to land exchange programs. The acquisition and exchange of tracts will be based on analysis that emphasizes the economic operation and maintenance of National Forest resources. The land acquisition program projects an acquisition of 3,020 acres for the next 10 years. This compares to the acquisition during the 1970-1980 period of 12,800 acres. These lands or interests in lands will be acquired on a priority basis according to the criteria for acquisition contained in this Plan.

The land exchange program for the next 10 years is anticipated at 31,600 acres. This compares with an exchange during the 1970-1980 period of 17,000 acres. Under this program, existing National Forest System lands can be traded for private lands or other public lands on an equal value basis. The exchange must meet some administrative need for resource use or development or increase the efficiency of operations.

Consolidation and exchange areas have been identified for each Ranger District. The land acquisition and land exchange programs will both be used to achieve consolidation objectives. The objective for the Cedar Creek District, the most highly fragmented ownership, is to develop consolidated land units of cost efficient and manageable size.

The consolidation of National Forest System lands by both programs will also reduce the miles of property boundaries to be located and marked. The property boundary location program is emphasized and prioritized under Plan direction. Opportunity for trespass that exists when ownership is in scattered tracts with unmarked boundary lines will be reduced. This will benefit the public and adjacent landowners. Forest Plan Appendices J and K provide an analysis of cost savings projected by this program direction.

Eleven Point National Scenic River Management - Management Problem 2

The Plan establishes standards and guidelines for the operation of the Eleven Point National Scenic River that specifically treat each issue. (See Chapter IV Management Prescription 8.1 Standards and Guidelines). Emphasis on environmental protection continues by managing a semi-primitive motorized environment. Motor vehicle access points are maintained at the currently authorized level of ten. The level of motor vehicle access site development has been lowered and their use by canoe outfitters has been redefined to reduce environmental impact and disruptive activities. Emphasis is also placed on dispersed recreation opportunities with developed sites managed at more primitive standards. Revised dispersed use policies permit greater use of the zone. Motor size restrictions on water craft have been retained to ensure the desired environments. Wildlife, timber, and range management activities are not permitted. Manipulation of the vegetation will be limited to that needed to ensure public safety, respond to natural catastrophe, or manage threatened or endangered species or species of concern.

Resource Protection vs. Resource Use - Management Problem 3

The Forest Plan provides a reasoned balance between public desires for natural resource products and for preservation of the natural environment.

An average annual timber harvest of 17.6 million cubic feet (105.6 million board feet) is possible over the next ten years. The average annual forage output supports the projected demand of 37,400 animal unit months. The entire Forest is available for mineral prospecting. Prospecting which requires surface disturbance is precluded in Wildernesses by law and on specific high investment or environmentally sensitive sites by standards and guidelines. The amount of land available for mineral development requiring surface disturbance in excess of that permitted for surface resource management is 1,090,570 acres or 75% of the Forest. Public demand for the goods and services available from the Forest can be met or exceeded over the five decade RPA period if the 10-15 year Plan direction is continued.

Demands for a natural environment are also met. The Forest contains seven Wildernesses which total 62,956 acres.

The opportunity for a semi-primitive recreational experience is provided on 344,000 acres, 78,600 acres of which excludes motorized recreation. An additional 25,900 acres are administered under Management Prescription 9.1. This prescription prohibits discretionary management investments such as timber sales and road construction. Management Prescription 8.1 is assigned to various areas throughout the Forest which have unique and outstanding natural character or are of unusual scenic or recreational significance. The seven areas totaling 39,045 acres which are of interest to many of the environmental groups are assigned to Management Prescription 6.1. This assignment perpetuates near natural conditions while permitting management of the resources. These seven areas are also identified for the application of the uneven-aged silvicultural system. This will reduce the impact of timber management on the visual resource. Areas which are candidates for Management Prescription 8.1 are assigned an interim status under Management Prescription 6.3. This prescription protects the present characteristics of the areas until a classification decision can be made. Nine research natural area candidates have been recommended for evaluation. Several previous candidate areas have been given Management Prescription 8.1-Forest Special Area classifications. These decisions are summarized in Forest Plan Appendix I.

Multiple use coordination and integration of resource activities to protect the environment is ensured by the standards and guidelines for each management prescription. The scenic naturalness of the Forest is maintained while natural resource products are made available to meet demands.

Fish and Wildlife Habitat Management - Management Problem 4

The Forest Plan provides a strong emphasis on fish and wildlife habitat management. Standards and guidelines for each management prescription provide detailed habitat objectives. These objectives emphasize the maintenance and development of habitat associated with wildlife indicator species and species requiring specialized habitat. The needs of species recognized as being threatened, endangered, rare, and sensitive by both Federal and State authorities are provided for. The protection of these species is given priority over other management activities if conflicts exist. The Forest currently has no known regional sensitive species. Forest Plan standards and guidelines provide for their recognition if management conflicts should be identified in the future. Projected demand for both consumptive and nonconsumptive use of fish and wildlife can be met during the five decade RPA period if this direction were continued beyond the 10-15 year Plan period.

Recreation Management - Management Problem 5

Recreation Opportunity Spectrum (ROS) objectives and Wilderness meet or exceed demand. Dispersed recreation is managed at varied intensities depending on management prescription. Developed recreation sites are managed at a low intensity. Lake and stream related recreation is managed at high intensity. Motorized recreation opportunities are commonly available. Specific unimproved roads are retained as part of the permanent road system to provide for recreational vehicle use as well as resource management access needs.

Road Network - Management Problem 6

The Plan reflects transportation system analysis based on management area allocations. Emphasis is on developing only those roads which are essential for resource management. Road development standards are at minimum acceptable levels for intended use. The Plan provides for a permanent road network of 2,585 miles, of which 470 miles remain to be developed. Of this remaining mileage, 424 miles will consist of improving present unimproved routes. New road construction will only involve 46 miles. This network includes 856 miles of unimproved roads retained at standards sufficient for off-road vehicle use and resource protection. Road network development is scheduled to be completed within the next two decades. Road network density and development standards vary by management prescription. All permanent roads included in the Forest transportation system will be open to public motor vehicle use unless closed for a specific management reason. Transportation planning in all management areas places greater emphasis on coordination of skidding distances and the use of temporary roads.

Timber Resource Management - Management Problem 7

The long-term sustained yield is 441 million cubic feet per decade. Management Prescription 3.2, emphasizing high value hardwood management, is assigned to 5 percent of the Forest utilizing 8 percent of the opportunity. Management Prescription 4.1, shortleaf pine emphasis, is assigned to 28 percent of the Forest and utilizes 45 percent of the opportunity. The balance of the timber output comes from management areas emphasizing other resources. Management Prescription 3.4, wildlife habitat emphasis, is applied to 34 percent of the Forest at medium to high intensities. This provides for substantial timber outputs while achieving habitat objectives.

Clearcutting will only be used where it is the optimum method to meet the multiple use objectives. Clearcutting will be limited to the levels necessary to meet wildlife habitat standards and guidelines. The shelterwood and seed tree final harvest methods will also be used as appropriate to achieve overall management objectives.

The uneven-aged silvicultural system will be evaluated during the 10-15 year Plan period by applying it to specific forest situations. This system will be applied to approximately 166,000 acres. This acreage is composed of riparian zones, bottomland hardwood forests, other specialized wildlife habitats, forest lands on the Cedar Creek District, eastern redcedar stands in the Cedar Glades Landtype Association, the 39,000 acres of sensitive areas under Management Prescription 6.1, stands containing a white oak component group occurring on ecological landtypes 7 and 18, and all ELT 7 and 18 in Management Prescription 3.2.

The attainment of demand depends on increased intermediate harvest cuts. Land suitable for timber management equals 1,282,500 acres. Timber demands in million cubic feet for each Ranger District during the first decade are: Ava (7.0), Cassville (5.0), Cedar Creek (0.5), Doniphan (9.8), Fredericktown (9.6), Houston (8.6), Poplar Bluff (31.0), Potosi (25.2), Rolla (7.6), Salem (27.0), Van Buren (11.5), Willow Springs (11.8), and Winona (20.4). These volumes ensure a continued Ranger District contribution to local timber industry.

Mineral Resource Program - Management Problem 8

The United States economy and lifestyle is based on a continuing supply of inexpensive minerals. Over time, the Congress of the United States has expressed its will on making National Forest minerals available for prospecting and development. Essentially the entire Forest or 1,397,700 acres is available for prospecting that would require surface disturbance. The exception is Wilderness. Wilderness may be explored for minerals if methods used do not result in surface disturbance.

Land available for mineral development which requires surface disturbance in excess of that permitted for management of surface resources is limited to approximately 1,090,570 acres. This excludes Wilderness (Management Prescription 5.1), Management Prescription 6.1, and ninety percent of Management Prescription 6.2 areas, which are not compatible with mineral development requiring surface disturbance beyond that permitted for management of surface resources. Provisions are identified in Forest-wide Standards and Guidelines 1900 and 2800 for the further evaluation of any mineral discoveries within these management areas.

Standards and guidelines provide for coordination with other resources (See Chapter IV).

Economic Efficiency - Management Problem 9

The Forest Plan is the most cost efficient combination of management prescriptions examined that meet the objectives sought. It is derived from the economic alternative modified to meet demand and to provide specific management direction for key areas. The present net value is 570 million dollars. This compares to a present net value of 599 million dollars for Benchmark 3, (maximum present net value). The benefit/cost ratio is 2.6:1 indicating that \$2.60 worth of benefits are generated for each \$1.00 of costs.

Employment generated by National Forest programs within the local economy is estimated at 11,804 jobs. Personal income generated by National Forest programs is estimated at 224.1 million dollars per year over the first ten years. Receipts to the U.S. Treasury are estimated at 12.4 million dollars annually. Returns to counties are estimated at 3 million dollars annually during the first decade. The operational budget is 11.8 million dollars annually during the first decade. The operational budget generates total annual benefits of 31.6 million dollars. These projections are in 1978 dollars. Actual values will follow inflationary trends. The benefits to local economies under Plan direction are the greatest of any of the alternatives analyzed.

Demand Satisfaction - Management Problem 10

The Forest Plan identifies program direction and outputs for a 10-15 year period. If Forest Plan direction were to be continued beyond the 10-15 year Plan period, projected demand could be met or exceeded for all outputs. Five-decade output capability for range is at 112 percent of demand. Semi-primitive recreation output capability is met at 108 percent of demand. Five-decade output capability for roaded natural and rural recreation is at 164 and 115 percent of demand, respectively. Wilderness output is capable of exceeding demand by 75 percent. Wildlife output capability is 101 percent of the five-decade demand.

Timber outputs are 100 percent of the five-decade demand. While investment to realize the production capacity in excess of demand will not be made, the opportunity provides a plan that can substantially adapt to increase in specific resource demands without decreasing other plan outputs.

Effective issue satisfaction is also achieved by this plan. This is accomplished, to a great degree, by the assignment of management prescriptions to the land. The Plan provides strong emphasis on Management Prescriptions 3.4, wildlife emphasis; 4.1, shortleaf pine emphasis; and 6.1/6.2, semi-primitive recreation emphasis.

Management Prescription 6.1 assignment includes the 39,045 acres in these seven areas: Swan Creek, Smith Creek, Lower Rock Creek, Van East Mountain, Big Spring Addition, North Fork, and Spring Creek. This mitigates the environmental concerns about the management of these areas.

A total of 1,397,700 acres (95.6% of National Forest System land) are available for mineral prospecting requiring surface disturbances. Mineral development can occur on 1,090,570 acres. Management Prescription 6.1, and ninety percent of Management Prescription 6.2 are excluded from mineral development which requires surface disturbance beyond that permitted for management of surface resources. Request for mineral development in these areas would need to be supported by further environmental analysis. Prospecting in Wilderness requires non-surface disturbing methods.

There are no conflicts with the plans and policies of Federal, Regional, State and local agencies or Indian Tribes due to Forest Plan direction.

Chapter V of the Forest Plan provides direction for updating the Plan and for recognition of changes in demand.

RESEARCH NEEDS

The following research subjects would improve the informational and technological data base used in the management of the Mark Twain National Forest. Input from other Federal, State and local governments, and universities as required by 36 CFR 219.7(e), was considered in identifying these subjects. Several of the subjects correspond to those identified in the Regional Guide for the Eastern Region, 1983. The Mark Twain National Forest requires specific research projects focused on unique Forest conditions.

These research subjects may be supplemented by additional needs identified during Forest Plan monitoring.

Subject: Effects of Fire on Vegetative Communities.

Problem: What are the adverse and beneficial effects of fire on vegetative communities associated with the Mark Twain National Forest management?

Background: The Forest is located in the transition zone of five major ecological forest associations. This creates a highly diverse plant community with widely varying sensitivity to fire. Often the proper use of fire is beneficial or essential to particular plant communities. In other communities it is detrimental.

The Forest has had one of the highest fire occurrence rates in the Forest Service. For the period of 1970 to 1980 it was among the highest five Forests. The Forest has averaged 350 fires per year for the last five years. Area burned during this period has averaged 3125 acres per year. Sixty-five percent of these fires are arson (purposely set).

Prescribed fire is used as a management tool to achieve various vegetative objectives, to prevent fuel build up, and to simulate natural fire occurrence.

This subject relates to Eastern Region research needs 8.5, 8.6 - R9-1 and Forest Management Problems 3, 4, 5, 7, and 9.

Need/Urgency: Improved knowledge of fire effects on specific vegetative situations is essential before truly effective use of fire as a management tool can be achieved. Such knowledge is vital in designing a cost effective response to wildfire control.

Specific research themes under this subject include the effect of fire on natural vegetative communities, on grasslands, as a tool to achieve specific wildlife habitats, on oak-hickory stands to assist oak regeneration, on the management of cedar glades, and for the control of competition in pine stands.

Subject: Quantification of Soil Productivity.

Problem: What is the productivity of soils common to the Mark Twain National Forest?

Background: There are currently 200 soil series identified on National Forest lands. Each is sensitive to management objectives and techniques. The National Forest Management Act mandates the maintenance of soil productivity. Standards and guidelines of the Forest Plan are designed to provide basic protection for the soil resource. The latitude available for management before productivity is threatened is known to only a limited degree. Management opportunities may be unnecessarily restrained in order to ensure a comfortable margin in maintaining soil productivity.

This subject relates to Eastern Region 12.1, 13.3, 14.2, research direction and Forest Management Problems 3, 4, 5, 6, 7, and 9.

Need/Urgency: Present Forest objectives can be achieved without jeopardy to soil productivity. Economically effective practices may be foregone for lack of soil productivity measures. This deficiency will limit the achievement of cost effective management and the incorporation of technological advances.

Specific research themes should focus on the more sensitive soil series first. Soil series effecting the largest areas should be focused on as second priority.

Subject: Management Indicator Species and Their Habitat.

Problem: What are the essential relationships between wildlife species, their habitat and their recreational use that are sensitive to National Forest resource management activities? How can these relationships be most effectively coordinated and evaluated to ensure the cost effective achievement of the wildlife resource objective?

Background: The Forest Plan identifies wildlife indicator species and establishes standards and guidelines for the management of their habitat. This is based on current state-of-the-art management. This direction is felt to be adequate in ensuring minimum viable populations of species indigenous to the Forest. For some species, particularly threatened and endangered species, this knowledge is quite subjective and focuses on ensuring protection as opposed to effective management of populations. Also many of the effects associated with management practices are imperfectly known. This subject relates to Eastern Region research direction 16.2, 16.4, 16.5, 16.6, 16.7 and Forest Management Problems 3, 4, 5, 7, 9, and 10.

Need/Urgency: A more thorough understanding of critical habitat parameters and their sensitivity to management is essential if cost effective management of all the associated resources is to be achieved.

Specific research themes under this subject are the needs of threatened and endangered species habitat, aquatic habitats and species inhabiting caves and other unique environments.

Subject: Baseline Data on Ecological Processes.

Problem: What are the essential ecological conditions, criteria, and their basic measures that need to be coordinated and evaluated relative to resource management practices?

Background: The Forest Plan calls for management practices based on sound ecological principles. Standards and guidelines presented in the Plan provide this assurance within current knowledge. There are many gaps in this knowledge. Some may be "nice to know," others may be critical to achieving management objectives. This subject relates to Eastern Region need 3.3, 3.4, 3.11, 3.12, 16.2, 16.6, 16.9, 18-R9-3 and Forest Management Problems 3, 4, 7, and 9.

Need/Urgency: Until a more thorough understanding of ecological relationships unique to the Forest is available many assumed effects will be based on imperfect knowledge.

Specific research themes under this subject are the identification of natural community species composition and the successional stages of natural community development.

Subject: Wilderness User Expectations in Missouri.

Problem: Who are the users of the small Wildernesses in Missouri and what are their expectations toward a Wilderness experience?

Background: The seven Wildernesses on the Mark Twain National Forest are relatively new and small. Public awareness of the areas is increasing from year to year. The Mark Twain National Forest Social Assessment states the following about Wilderness users. They are generally 25 to 34 years of age. Ninety five percent are male. They are city dwellers at a ratio of 3 to 1. Most users have from 13 to 16 years of education. Seventy-five percent of them are employed while 18 percent are in school. Fifty percent are professional or technical workers. This subject is a refinement of Eastern Region need 18-R9-1, 18-R9-4 and relates to Forest Management Problem 3.

Need/Urgency: This data can be considered baseline information and a starting point to compile a better understanding of the expectations of this group of Forest users. A better understanding of this group and their desires can improve the Wilderness experiences provided by the seven areas on the Forest and throughout the Eastern Region.

Specific research themes under this subject are the types of facilities sought and the level of their development.

Subject: Visitor Impacts in Small Wildernesses.

Problem: What are the acceptable levels of change for Mark Twain National Forest Wildernesses? How can the effects of users on small Wildernesses be kept within these acceptable levels?

Background: In less than 8 years the Forest has gone from no Wilderness to seven Wildernesses. These are relatively small areas ranging in size from 4,159 acres to 16,500 acres and averaging 9,000 acres. The level and type of use varies by area. In some areas, the existing use is concentrated around natural features such as a cave, a waterfall, or along a trail corridor. This concentration of use has the potential to adversely impact the more attractive natural sites in the Wilderness. At the same time, this concentration of use has the potential to diminish the solitude and quality of experience attributed to Wilderness. Some are subject to prior existing private usage. This is a refinement of Eastern Region 18-R9-2, 18.7 and relates to Forest Management Problem 3.

Need/Urgency: Since the first Wilderness on the Mark Twain National Forest was designated in 1976 a sizable annual visitation has developed. The designation as Wilderness has generally increased public awareness and their usage. This is a situation that exists throughout the Eastern Region. It is timely that recreation research be initiated to guide the management within the mandates of the Wilderness Act of 1964 as amended. Although substantial problems with deterioration of the Wilderness resources do not yet exist in Missouri, research on the identification and measurement of acceptable levels of change can avoid the need to rehabilitate a damaged Wilderness environment.

Specific research themes sought under this subject are acceptable use densities, the control of waste, the impact on soils, and acceptable site hardening techniques.

Subject: The Use of Genetically Improved Seed and Planting Stock to Improve Productivity.

Problem: What are the most effective uses for genetically improved vegetation to meet management objectives?

Background: Standards and guidelines permit the use of genetically improved seed and planting stock for both forest and grassland production in several management prescriptions. Past research has emphasized the genetic improvement of shortleaf pine. Some work has been done on oak species. Factors such as broader species evaluation, economic payoffs, and ecological impacts have not been fully evaluated. This subject relates to Eastern Region need 3.1, 3.2, 3.3, 3.4, 3.46, and Forest Management Problems 3, 7, 9, and 10.

Need/Urgency: Potential may exist to improve cost effectiveness of forest and rangeland management through the use of genetically improved stock. The tradeoff and advantages of such a program are not clearly understood relative to Forest conditions and needs. Opportunities toward improved management will be foregone in the absence of more thorough knowledge on this subject.

Specific research themes under the subject are the genetic development of high value hardwood species, growth and yield expectations of genetically improved stock, cost effective establishment techniques and impacts on stand ecology.

Subject: Growth and Yield Expectations for Particular Timber Species and Forest Communities by Site Conditions.

Problem: What growth and yield can be expected from site conditions on the Forest relative to management prescriptions assigned by the Forest Plan?

Background: Although considerable research has been done on growth and yield determination by species there is a lack of definitive information concerning site specific Forest conditions. This is particularly true when stand objectives are focused on natural community maintenance as opposed to emphasis on production of a particular species (i.e. shortleaf pine). The Forest Plan calls for extensive application of management prescriptions emphasizing natural communities. This subject is a refinement of Eastern Region need 3.3, 3.46, 5.2 and relates to Forest Management Problems 3, 7, 9, and 10.

Need/Urgency: There is concern that the timber yield tables used in this initial Forest Plan analysis are calling for too high a production. This is especially true when multiple use coordination and economic parameters call for more extensive silvicultural manipulation. Most research is not Forest specific and focuses on intensive stand manipulation for a particular species. Improved growth and yield data considering the multiple use impacts to stand production is critical to the effective updating of this Plan.

Specific research themes under this subject are growth and yield associated with different Ecological Landtypes managed for Pine, Oak-Pine, Bottomland Hardwood, Eastern Redcedar and Natural Vegetative Communities.

Subject: Growth and Yield of Forage Crops from Forest Specific Site Conditions.

Problem: What are the best grasses to use to achieve multiple use objectives while emphasizing the opportunity for range forage?

Background: The Forest has a substantial grassland resource. This resource has supported a range program for many years. Management focuses on both the use of natural grasslands and the establishment of pastures. Current emphasis is on the management of native warm season grasses. The Forest emphasizes the management of its grassland resources for the achievement of multiple use benefits, primarily wildlife habitat. Grazing and haying are used as tools to achieve these multiple use benefits in a cost effective manner. This subject relates to Eastern Region needs 15.4, 15-R9-1, 15-R9-2, 15-R9-3, 15-R9-6 and Forest Management Problems 3, 4, 9, and 10.

Need/Urgency: Grassland development for range forage involves high initial development costs. These costs can be better controlled and evaluated by more clearly defining per acre forage production relative to demand satisfaction and multiple use objectives. Cost effective improvements in the range management program are essential in light of declining range budgets.

Subject: The Identification of Local Area Values of Forest Resources.

Problem: What are the local area values for both market and non-market outputs?

Background: The initial Forest Plan analysis used values based on the 1980 RPA assessment for most of the outputs evaluated. The question of how valid these values are relative to the local economy is often raised. How these values are allocated to specific outputs under multiple use prescriptions needs to be better addressed. For example, if wildlife outputs are valued at 20 dollars per visitor day and the timber program directly provides a substantial part of the habitat which supports wildlife populations, which part, if any, of the value should be included as a benefit in timber economic calculations. The RPA values are based on total benefits generated regardless of who receives them. The portion of these values that can be construed as benefit to strictly Forest Service investment is not clear. This subject relates to Eastern Region needs 1.47, 2.2, 11.1, 17.8-R9-1, 17.44, 5.2 and Forest Management Problems 9 and 10.

Need/Urgency: The values assigned to scheduled outputs have played a critical role in the assignment of management prescriptions and the level of management intensity on the Mark Twain National Forest. It is important that these values are valid to specific Forest situations in subsequent economic analysis.

Specific research themes under this subject are local values for developed recreation, recreation by ROS class, Wilderness, consumptive and non-consumptive uses of wildlife, range production and timber production by species and product.

Subject: Demand for Mark Twain National Forest Resources.

Problem: What is the current and projected demand for Forest resources?

Background: Demand projections used in the Forest Plan analysis are derived from a base year(s) of use and projected by RPA assessment coefficients. It has been argued that use is not an effective basis for demand projection. Unfortunately previous demand studies relative to the Forest influence area are seriously outdated. Also, the Forest has substantial opportunity to increase production through better resource utilization. The market for this increased production needs to be determined and established when warranted. This subject relates to Eastern Region needs 1.1, 1.2, 1.47, 1.5, 1.6 and Forest Management Problems 9 and 10.

Need/Urgency: Demand satisfaction is a primary consideration of the Forest Plan analysis. It is also defined as a primary issue. A more definitive analysis of demand for Forest resources is essential to the effective updating of Forest Plan objectives. Specific demands are needed for timber production by species and product, developed recreation by experience level, recreation by R.O.S. class, wildlife use both consumptive and non-consumptive, Wilderness, range forage, water yield and minerals.

Subject: Management Techniques for Achieving Multiple Use Stand Objectives.

Problem: What are the management practice options and schedules best suited to meet multiple use stand structure objectives?

Background: Previous research has been oriented toward stand treatment procedures that emphasize a specific plant species under maximum unilateral production. Management practices applied by the Forest invariably involve objectives that are more broadly based in terms of per acre species composition and production levels. Assumptions relative to applying specific species oriented research for multiple use objectives are often subjective with results difficult to monitor and evaluate. This subject relates to Eastern Region needs 3.1, 3.2, 3.3, 3.4, 3.9, 3.10, 6.1, 6.46, 6.47, 7.4, 8.5, 8.6, 14.2, 14-R9-1, and Forest Management Problems 3, 4, 5, 7, and 9.

Need/Urgency: Without a redirection of research toward multiple use oriented stand objectives managers will not have a sound basis for evaluating their program. This will cause problems in responding to the emphasis on environmental protection and multiple use stand outputs.

Specific research themes under this subject include practices to achieve stand objectives for high value hardwood production, natural community stand structure based on plant succession, herbacious communities, the assurance of oak regeneration, and biological techniques for integrated pest management.