Monongahela National Forest

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Summary of the Final Environmental Impact Statement for Forest Plan Revision

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Summary
of the
Final Environmental Impact Statement
for the
Monongahela National Forest,
Forest Plan Revision

September, 2006

Barbour, Grant, Greebrier, Nicholas, Pendleton, Pocahontas, Preston, Randolph, Tucker, and Webster Counties in West Virginia

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Abstract

The Monongahela National Forest was founded in 1920 to recover lands impacted by uncontrolled logging, fire, and floods. The U.S. government established a "proclamation boundary" within which parcels of land could be purchased to increase the size and benefits of the Forest. The Forest is now more than 919,000 acres located in east central West Virginia. The USDA Forest Service administers the MNF, aided by cooperators, other agencies, contractors, and concessionaires. Forest personnel practice multiple-use natural resource management, providing West Virginia and the surrounding region with wood products, natural gas, improving watersheds, a wide range of recreation opportunities, diverse habitat for wildlife, and protection of unique ecological and wilderness areas.

Under the Multiple-Use Sustained-Yield Act of 1960, the Forest and Rangeland Renewable Resources Planning Act of 1974, and the National Forest Management Act (NFMA) of 1976, National Forest System lands are managed for a variety of uses on a sustained yield basis to ensure a continued supply of goods and services. The NFMA specifies that forest plans will be developed for all national forests and should be revised at least every 15 years. The original Land and Resource Management Plan for the Monongahela was approved in 1986, and since then there have been changes in Forest conditions, laws and policies, public interests, science and technology, and in the way we implement and monitor activities on the Forest. These combined factors are the basis for revision of the Forest Plan.

Following direction from the National Environmental Policy Act, the Forest has prepared an Environmental Impact Statement (EIS) for the revision of the 1986 Forest Plan. The EIS provides the purpose and need for Plan revision, presents issues addressed, describes management alternatives considered to respond to those issues, and analyzes the potential environmental effects of the alternatives.

In July 2005, the Forest Service released for public review and comment a Draft EIS that described four alternatives for managing the Monongahela National Forest. Alternative 2 was the Preferred Alternative in the Draft EIS and was the foundation for the Proposed Revised Forest Plan. Alternative 2 was modified for the Final EIS to address public comments and new information received since the release of the Draft EIS. A fifth alternative, Alternative 2 Modified (or Alternative 2M), was the result. Alternative 2M is the Preferred Alternative in the Final EIS and the foundation for the 2006 Revised Land and Resource Management Plan for the Monongahela National Forest.

This Summary of the FEIS documents the analysis of the five alternatives developed for programmatic management of the Monongahela National Forest. The Selected Alternative in the Record of Decision that accompanies the Final EIS will be the 2006 Forest Plan that guides all natural resource management activities on the Forest, addresses new information and concerns raised since the 1986 Forest Plan release, and meets the intent of all applicable federal laws, regulations, and policies. The Selected Alternative, and the rationale for its selection, are described in the Record of Decision for this Final EIS. The Record of Decision, FEIS and 2006 Forest Plan are available on request from: Monongahela National Forest, 200 Sycamore Street, Elkins, WV 26241.

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Major Changes Between the Draft and Final EIS

Chapter 1

We added a list of decision criteria to help clarify how the Preferred Alternative was chosen. We revised a few of the issue indicators to make them more consistent with those found in Chapter 3. We expanded the description for candidate RNAs to clarify which areas have been retained and which have been added between the 1986 Plan and 2006 Plan.

Chapter 2

In response to comments on the DEIS, several new alternatives were considered but eliminated from detailed study for the rationale provided for each. Alternative 2 Modified was generated from changes suggested by comments on the DEIS. The Comparison of Alternatives section was updated to include the results of the analyses of Alternative 2 Modified in Chapter 3. In response to comments on the DEIS, we expanded the discussion to provide information on how and why the Preferred Alternative was chosen.

Chapter 3

For each resource section, we added an effects analysis for Alternative 2 Modified that was developed between the Draft and Final. We also updated information where we had more recent available data.

Air Quality – We added emission factors for helicopter harvest to the effects analysis.

Soil Resource – We added a discussion (Management Implications) in the Cumulative Effects section on the challenges and options for addressing potential cumulative effects from managing on sensitive soils.

Water, Riparian, and Aquatic Resources – We expanded the analysis for aquatic MIS.

Threatened and Endangered Species – We expanded the affected environment descriptions to include more information on the animal species and their habitats. We also expanded the effects sections to provide more detailed analyses that we carried forward into the Biological Assessment.

Timber Supply – In response to comments on the DEIS, we added a Table TR-6 showing timberland in West Virginia by ownership, and we added volume harvested to Table TR-4.

Recreation and Wilderness – In response to comments on the DEIS, we added recent information on the economic impacts of tourism in West Virginia. We explained a discrepancy in MP 5.0 wilderness acres used in the FEIS vs. DEIS. We refined and expanded the ROS analysis to better describe changes expected by Management Prescription

area. We added more detailed tables to show differences in MP 6.2 and 8.1 SPNM areas by alternative. We incorporated two new IRAs into the Inventoried Roadless Area analysis.

Road Transportation System – In response to comments on the DEIS, we added as section that compares potential road miles needed for timber harvest, based on harvest area distances from existing roads.

Social and Economic Environment – In response to comments on the DEIS, we revised the county profiles to include more accurate information and added total full-time and part-time employment, and we added State statistics on employment to provide a State-wide context to the economic impacts in the MNF 10-County Region. We also re-ran the models for employment and income outputs by alternative with updated budget and revenue inputs.

Appendices

Appendix A – We updated information to include public involvement activities between the Draft and Final.

Appendix B – We added editorial changes and clarifications. We expanded our discussion of the Determination of Suitable Acreage to explain how the suitability assessment meets the intent of cost efficiency in the CFR regulations.

Appendix C – We added two new areas to the Roadless Area Inventory: Roaring Plains East and Roaring Plains West, which we evaluated in full. We also added a discussion on areas that made the inventory but were reduced from their original size. We corrected the Roadless Area Conservation Rule tables to exclude existing Wilderness and the National Recreation Area, and we added a table for Alternative 2M. We updated the Management Disposition Tables to include Alternative 2M, and we dropped the Development Potential tables, as the potential for timber harvest and mineral development is already captured in the text.

Appendix D – We added new species to the evaluations in response to public comments.

Appendix E – We revised some of the species evaluations between Draft and Final.

Appendix F – We added some references that are cited in the EIS, and we removed some references that are not cited in the EIS.

Appendix G – We updated and added a few definitions and acronyms between Draft and Final.

Appendix H – This appendix is the Biological Assessment for threatened and endangered species that was completed between Draft and Final.

Appendix I – This appendix has the responses to comments on the DEIS and Proposed Revised Forest Plan, and it includes letters from agencies, tribes, and elected officials.

Lower Falls, Falls of Hills Creek Scenic Area

INTRODUCTION

This Summary of the Final Environmental Impact Statement (FEIS) for the Monongahela Forest Plan Revision serves to provide you, the reader, with an overview of the planning process, the issues, and the alternatives that were used to help decide how the Forest is to be managed for the next 10 years and beyond.

This summary contains a description of the proposed action, and the purpose and need for the proposed action, a discussion of issues, descriptions of the alternatives considered, and a summary of environmental consequences the alternatives may have on the issues. The Forest Plan Revision project record, a collection of supporting documents and records of the analysis process, is available for review upon request.

THE PROPOSED ACTION

The Forest Service proposes to revise the Land and Resource Management Plan (hereafter referred to as "Forest Plan" or the "2006 Plan") for the Monongahela National Forest. The original Forest Plan was approved and released in 1986, and includes 6 significant amendments that have occurred since. The 2006 Forest Plan establishes direction for managing resources on National Forest System lands within the proclaimed boundaries of the Monongahela National Forest.

This Final Environmental Impact Statement (FEIS or Final EIS) describes five alternatives for revising the Forest Plan and discloses the potential environmental effects of these alternatives. The FEIS is guided by the implementing regulations of the National Environmental Policy Act (NEPA) found in the Council of Environmental Quality Regulations, Title 40, Code of Federal Regulations, Part 1500. The companion document to this FEIS is the 2006 Forest Plan, a detailed presentation of the preferred alternative described in Chapter 2 of this FEIS.

FOREST PLAN DECISIONS

National Forest System management decisions are made in two stages. The first stage is the Forest Plan, which establishes direction and prescription areas that guide the overall management and allocation of resources and land conditions on the Forest. The second stage is the analysis and approval of project proposals at a more site-specific level. The Forest Plan does not compel the agency to undertake any site-specific project; rather it provides goals and objectives for the Forest to strive to meet in order to achieve desired physical, biological, social, and economic conditions. The Forest Plan also establishes limitations on what actions may be authorized, and what conditions must be met, during project-level decision making.

The authorization of site-specific actions within the Forest Plan area occurs through project decision making, which is the implementation stage of forest planning. Project decisions must comply with NEPA procedures and must be consistent with the Forest Plan.

The six key decisions made in forest planning for long-term management of the Forest are:
1) Establishment of Forest-wide multiple-use goals and objectives, including a description of the desired future condition of the Forest.
2) Establishment of Forest-wide standards and guidelines applying to future activities.
3) Establishment of management areas and direction applying to future activities in those management areas.
4) Identification of lands not suited for timber production and the allowable sale quantity determination for timber that may be sold from the suited timber base during each decade.
5) Establishment of monitoring and evaluation requirements that will provide a basis for a periodic determination of the effects of management practices.
6) Recommendation to Congress of areas for wilderness designation.

The 2006 Forest Plan includes much of the direction and many of the prescriptions found in the 1986 Forest Plan and its amendments. The 2006 Forest Plan also proposes new direction and new prescriptions. The 2006 Forest Plan will replace the 1986 Plan and amendments once the responsible official signs the Record Of Decision for this revision.

THE RESPONSIBLE OFFICIAL

The Regional Forester is the responsible official for the analysis and decisions in this Forest Plan revision. Conducting analysis, developing alternatives, and preparing the FEIS were done at the local Forest level under the direction of the Monongahela Forest Supervisor. Based on the analysis in the FEIS, the Regional Forester selected an alternative to become the 2006 Forest Plan. This alternative includes the six key Forest Plan decisions noted above.

FOREST PROFILE

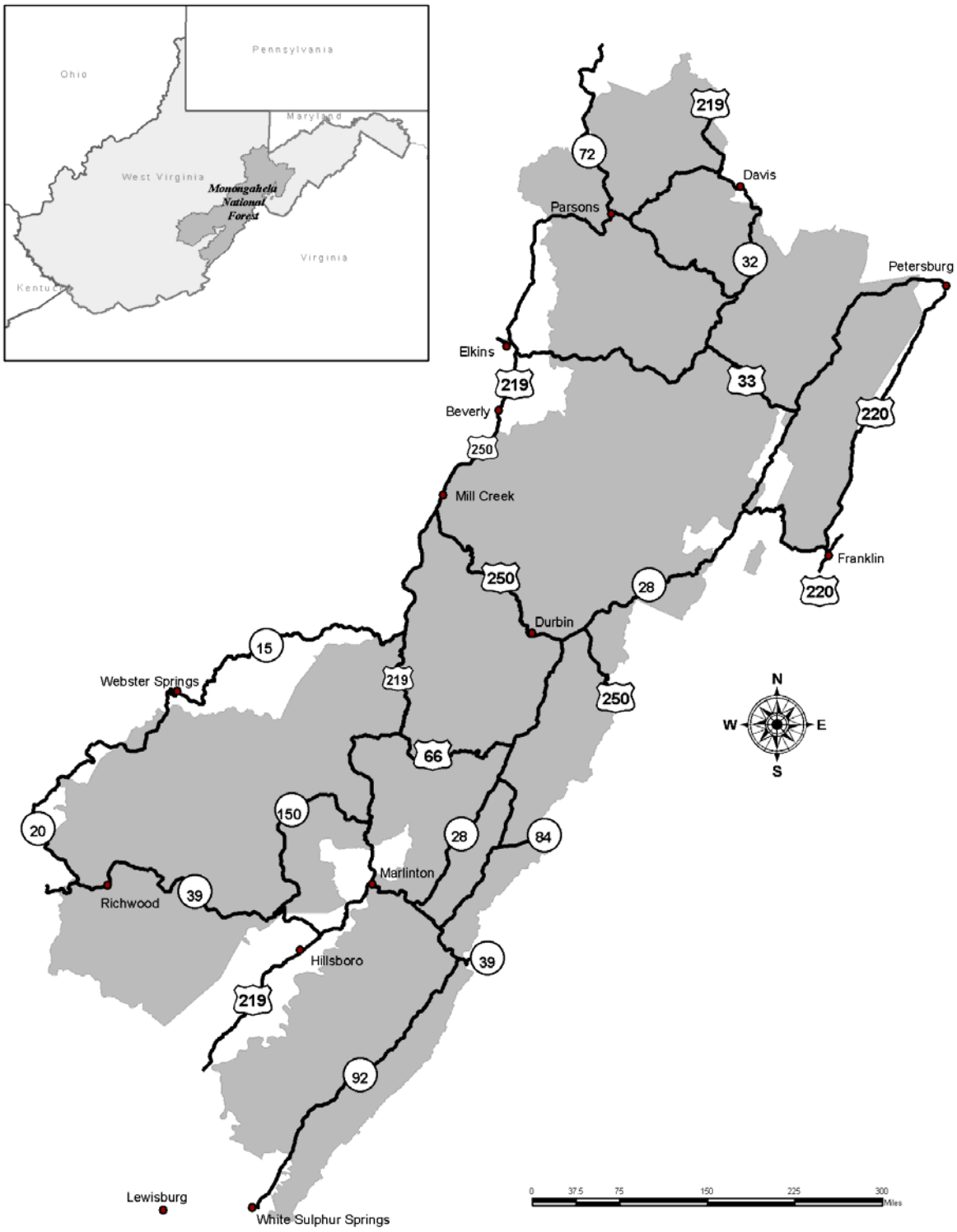
The Monongahela National Forest comprises over 919,000 acres of National Forest System lands in West Virginia (see Figure S-1). It is, by far, the largest expanse of public land in the State. The Forest is located primarily in Grant, Greenbrier, Nicholas, Pendleton, Pocahontas, Randolph, Tucker, and Webster Counties, with minor portions in Barbour and Preston Counties. It is administratively divided into four Ranger Districts: Cheat-Potomac, Gauley, Greenbrier, and Marlinton-White Sulphur Springs.

PURPOSE AND NEED FOR THE PROPOSED ACTION

Purpose

The purpose of the Proposed Action is to provide a revised Plan that will:
- Guide resource management activities on the Forest,
- Address changed conditions and direction since the 1986 plan was released,
- Emphasize adaptive management over the long term,
- Meet the objectives and requirements of federal laws, regulations, and policies,

Figure S-1. Vicinity Map for the Monongahela National Forest



- Maintain or restore long-term ecosystem and watershed health and integrity,
- Contribute to the economic and social needs of people, cultures, and communities,
- Provide consistent direction at the Forest level that will assist managers in making project

Management direction and monitoring in the 2006 Forest Plan is designed to meet the purpose statements above. Overall management emphasis will largely be determined by selecting a management alternative that best achieves a combination of the following decision criteria:

- The extent the alternative maintains or restores water quality and the soil productivity necessary to support ecological functions in upland, riparian, and aquatic areas.
- The extent the alternative maintains or restores plant and animal diversity and provides habitats needed to sustain viable populations of native and desired non-native species, including threatened, endangered, sensitive, and management indicator species.
- The extent the alternative maintains or restores forest vegetation to a healthy condition with reduced risk of damage from fires, insects, diseases, and invasive species.
- The extent the alternative provides settings for a variety of recreation opportunities, including backcountry or use within a semi-primitive non-motorized recreation setting.
- The extent the alternative provides a variety of uses, values, products and services for present and future generations by managing within the capability of sustainable ecosystems.

Need

The Forest Supervisor and Regional Forester initiated revision of the Forest Plan based on a number of factors, including legal requirements and other needs for change described below.

Legal Requirements

Regulations implementing the National Forest Management Act (NFMA) (1976) require the Regional Forester to revise forest plans and provide the basis for revision. In 1982, forest plan revision instructions to were formulated in the Code of Federal Regulations at 36 CFR 219. The regulations were being revised when this forest plan revision began. Therefore, the Responsible Official decided to complete plan revision for the Forest under direction provided by the 1982 regulations. Specific instructions found at 36 CFR 219.10(g) state:

> "A forest plan shall ordinarily be revised on a 10-year cycle or at least every 15 years. It also may be revised whenever the Forest Supervisor determines that conditions or demands in the area covered by the plan have changed significantly, or when changes in RPA policies, goals, or objectives would have a significant effect on forest level programs."

The Forest Supervisor determined that revision was warranted due to the time period allotted for revision, and because significant changes had occurred in conditions and demands.

Need For Change

The Forest began evaluating the need for changing the Forest Plan in 2001, anticipating that the Forest Plan would be revised beginning in 2002. A preliminary evaluation began with the

assessment of new information and changed conditions that occurred during implementation of the current Forest Plan. Sources of information for this effort include:

- Meetings with Forest Service employees on each Ranger District;
- Discussions with non-governmental partners and interest groups;
- Discussions with other federal and state agencies, and county officials;
- Review of major decisions that were influenced by the current Forest Plan;
- Review of issues raised in appeals and litigation;
- Results of monitoring and evaluation;
- Changes in law and policy that are relevant to planning and management; and
- Relevant new scientific information.

The Revision Team identified, reviewed, and refined Need for Change topics based on these sources and public comments. The final major Need for Change topics were:

- Backcountry Recreation
- Vegetation Management
- Timber Supply
- Soils and Water

These topics were carried forward to become major Need for Change topics or issues for this FEIS. The Backcountry Recreation topic is addressed in the Recreation and Wilderness issue described in the Issues Analyzed in Detail section, below. The Timber Supply and Vegetation Management topics are covered under the Timber Supply and Vegetation Management issues, below. The Soil and Water topic is covered primarily under the Soil Resource issue, below, although additional information related to this topic can be found in the Air Quality and Watershed, Riparian, and Aquatic Resources issues.

ISSUES

Issue Identification

Issues are used in environmental analysis to formulate alternatives, prescribe mitigation measures, or analyze environmental effects among alternatives. At the forest planning level, mitigation measures are incorporated into management direction (goals, objectives, standards, and guidelines) or Management Prescriptions that influence the type, amount, and intensity of management actions that may be implemented under the Forest Plan. The Responsible Official selected major issues for revision based on the need for change topics listed above and one or more of the following criteria:

- Would these issues be used to help develop management alternatives or management direction, or would they be used in the allocation of Management Prescriptions?
- Would the management alternatives, direction, or prescriptions have discernable effects on the issues, their related resources, Forest programs, or outputs?
- Would effects to the issues be sufficiently different by alternative to provide the Responsible Official with rationale for choosing a preferred or selected alternative?

Issues are described below using an issue statement, a brief background explanation that includes how the issue was considered in the revision process, and a summary of the issue indicators used to track effects associated with the issue. More information concerning the issues and indicators can be found in the various sections of Chapter 3 of the FEIS.

Most issues are described in terms of how Forest Plan management strategies may affect specific resources or conditions. The term "management strategies" generally refers to Forest Plan management direction (i.e., goals, objectives, standards, and guidelines) and the allocation of Management Prescriptions (MPs) that differ by alternative. The MPs provide a broad range of management emphasis that would allow for a different mix of management activities and intensities to potentially occur under each alternative. The Forest Plan, however, does not authorize the implementation of any management activities.

Issues Analyzed in Detail

Air Quality

Issue: Forest Plan management strategies may affect air quality in and around the Forest. Although a majority of this area's pollution comes from sources outside the Forest, activities from within the Forest boundaries can also affect air quality in the region. Activities such as timber harvesting, oil and gas well drilling and operations, road construction/ maintenance and prescribed fires all produce emissions. Additionally, effects of these activities may exacerbate existing air quality related issues. Two activities in particular, timber harvesting and prescribed fire, are expected to affect air quality on the Forest. Particulate matter and nitrogen oxide emissions from these activities will contribute to the total pollution load and are the major pollutants of concern. Therefore, potential emissions of these pollutants will serve as indicators for air quality effects.

Indicators: Potential emissions of particulate matter and nitrogen oxide from timber harvest and prescribed fire are evaluated and compared to total emissions in counties near the Forest.

Soil Resource

Issue: Forest Plan management strategies may affect the soil resource. Erosion and acid deposition occur to varying degrees across the entire Forest, and their effects to soil can be exacerbated by soil disturbance. The Management Prescriptions (MPs) in the Forest Plan provide for a variety of activities to occur on varying soil types, ranging from little or no management or soil disturbance in Wilderness to activities that call for a total commitment of the soil resource where soil is removed and replaced with a permanent facility. Although certain soil-disturbing activities, like mineral development or mountain biking, can occur in localized areas throughout the Forest, large-scale soil disturbance associated with timber harvest and road construction most often occur in MPs with suitable timberland. Because the amount and distribution of these MPs and their predicted activities vary by alternative, they can be used to show relative differences in the potential that timber harvest and road construction may have for impacts on soil quality and productivity related to:

1) Soil erosion and sedimentation, and

2) Soil nutrient depletion and soil acidification related to acid deposition

Indicators:

- Acres of potential timber harvest in suited MPs by alternative,
- Acres of high-risk acid sensitive soils by MP by alternative.

Watershed, Riparian, and Aquatic Resources

Issue: Forest timber management strategies may affect watershed, riparian and aquatic resources. Timber harvest and connected actions have the potential to affect a number of watershed processes. The removal of timber, the type of logging method used and the associated transportation system all have the potential to affect watershed, riparian and aquatic conditions to varying degrees. The potential risk of these activities is dependent on the scope of the action, existing site conditions, and the effectiveness of the mitigation measures used. Because the amount and distribution of timber harvest varies by alternative, it can be used to show the relative differences in the potential impacts related to:

- Soil erosion and sedimentation effects on aquatic ecosystems,
- Soil nutrient and base cation depletion and soil acidification related to acid deposition,
- Water quality and quantity, and
- Channel and floodplain modifications.

Indicators:

- Acres of Management Prescriptions that allow commercial timber harvest by alternative,
- Acres, volume, and logging methods of potential timber harvest by alternative

Terrestrial Ecosystem Diversity (Coarse Filter)

Issue: Forest Plan management strategies may affect the amount, distribution, structure, and composition of ecological communities. Ecological communities are the foundation of biological diversity. Communities on the Forest include those in need of ecological restoration, such as spruce forests and oak forests, as well as unique communities in need of protection, such as bogs and shale barrens. A key function of forest planning is to provide for such restoration and protection needs while also providing a mix of diverse habitats to meet the demands of multiple uses.

To address requirements for maintaining diversity and viable populations, the Forest Service has developed an analysis process called species viability evaluation. Species viability evaluation takes a two-part approach that is referred to as a “coarse-filter/fine-filter” approach, or an “ecosystem diversity/species diversity” approach. Coarse-filter analysis evaluates biodiversity conservation through a classification and assessment of the component ecosystems that make up a landscape. It is based upon the theory that conserving an adequate representation of plant and animal communities will maintain most species that occur in a given planning area.

This analysis focuses on ecological communities that predominate on the landscape; communities that are rare, unique, or declining; and communities that provide habitat for species with potential viability concerns. Communities were evaluated for direct effects of management

on National Forest System (NFS) land. Communities and the species that inhabit them also are affected by activities on intermingled non-NFS land; therefore, the cumulative effects of Forest Service and other activities were evaluated to the extent possible for all land within the Forest boundary (proclamation boundary and purchase units).

Indicators:
- Amount and development stages of major forested communities by alternative
- Amount of each rare and unique community potentially affected by alternative
- Representation of ecological communities in Minimum Dynamic Area reserves by alternative

Terrestrial Species Viability (Fine Filter)

Issue: Forest Plan management strategies may affect the level of risk to species with potential viability concerns, and may also be used to provide a mix of habitats for the species found on the Forest. Maintenance of species viability is an integral component of the Forest Service's responsibility to conserve biological diversity. The fine-filter analysis focuses on species that may have viability concerns within the Forest boundary or have been identified by others as species of concern due to declining populations or other factors. From the 451 species that were considered in this analysis, the screening process produced a list of 219 species to be evaluated in detail. These species include 14 mammals, 60 birds, 5 amphibians, 5 reptiles, 53 invertebrates, 75 vascular plants, and 7 nonvascular plants.

Because of the large number of species evaluated and a lack of detailed information for many of them, quantitative population viability analysis was not a practical way to assess species viability. Instead, a qualitative rating system was used that produced a viability outcome for each species. These outcomes range from A to E on a graduated scale, depending on habitat abundance, habitat distribution and connectivity, and population factors.

As part of its strategy to address NFMA viability requirements and avert the need for listing under the Endangered Species Act (ESA), each region of the Forest Service has developed a list of Regional Forester's Sensitive Species (RFSS), which are species for which population viability may be a concern. Forest Service Manual direction requires Forests to determine whether their actions will affect RFSS, and if so, whether the actions will result in a loss of viability or a trend toward federal listing.

Indicators:
- Distribution of viability outcomes by alternative
- Effect determinations for Regional Forester's Sensitive Species

Terrestrial Management Indicator Species (MIS) and Other Species of Interest

Issue: Forest Plan management strategies may affect habitat for MIS and other species of management interest. NFMA regulations require Forests to select MIS to estimate the effects of each alternative on fish and wildlife populations. The regulations further direct that MIS are to be chosen that are believed to indicate the effects of management activities. Proposed MIS for the Forest are cerulean warbler, wild turkey, West Virginia northern flying squirrel, and eastern

brook trout. Habitat indicators were projected for Forest Service land to reflect direct and indirect effects of expected Forest Service management. Habitat indicators for the terrestrial MIS and other species of interest are described below; indicators for brook trout are discussed in the *Watershed, Aquatic, and Riparian Resources* section. A limited habitat-related discussion is included here for West Virginia northern flying squirrel; a more detailed analysis for this species is included in the *Threatened and Endangered Species* section.

Many species on the Forest are important to the public. While analyzing every species on the Forest is not practical, the Forest is home to two high-interest game species that were not otherwise analyzed in this EIS: white-tailed deer and black bear.

Indicators:

- Optimum habitat for cerulean warbler.
- Optimum habitat for wild turkey.
- Optimum habitat for West Virginia northern flying squirrel and potential active spruce restoration areas.
- Edge habitats providing abundant browse for white-tailed deer.
- Optimum habitat for black bear.

Threatened and Endangered Species

Issue: Forest Plan strategies may affect federally listed species and their habitats. Federal agencies must comply with the ESA of 1973 as amended, which includes a requirement to consult with the U.S. Department of Interior, Fish and Wildlife Service on projects that may affect threatened, endangered or proposed species. Currently there are nine federally listed species known to occur on the MNF, but no species that are proposed for listing.

Although Forest Plan revision would have no direct effects on listed species, Plan revision does provide for species protection and habitat restoration through management direction and the allocation of Management Prescriptions that would limit or prohibit management activities that pose a threat to listed species or their habitats. Other Management Prescriptions could allow certain activities that may pose threats. This analysis looks at the relationships between those prescriptions and how management allowed within them may potentially affect listed species and their habitats.

Indicators: For each listed species, effects are assessed by determining whether Forest Plan management direction is adequate to protect listed species and their habitats from potential effects of the four management alternatives considered in detail. Potential effects for some species are based on the level and intensity of management activities that could occur under the Management Prescriptions assigned to each alternative.

Non-native Invasive Plant Species

Issue: Forest Plan management strategies may affect the spread and control of non-native invasive species (NNIS). NNIS have been recognized at the national level as one of the four major threats to the ecological sustainability of NFS land. NNIS spread via a variety of

pathways. For most species, invasion and spread are facilitated by some type of human-caused habitat alteration, especially those alterations that include soil disturbance. Typical alterations that can encourage NNIS include roads, hiking and horse trails, grazing allotments, utility corridors, wildlife openings, or vegetation management. Some of these factors, such as trails, grazing allotments, and utility corridors, are not likely to change much by alternative. However, road construction and wildlife opening construction are likely to vary according to the amount of land that is allocated to MPs that emphasize vegetation management. Road construction is directly related to the amount of timber harvesting that is conducted in areas that do not already have adequate access.

Indicator:

- Amount of timber harvest 3/8 of a mile or more from existing roads by alternative,
- Amount of maintained openings by alternative.

Vegetation Management

Issue #1: Forest Plan management strategies may affect the potential for vegetation diversity and sustainability across the Forest. The Forest Service is responsible for providing a diversity of plant and animal communities and tree species while providing for the overall multiple-use objectives of national forests. The Forest Service is also responsible for ensuring a sustainable flow of forest products, as described in the Multiple-Use Sustained Yield Act.

An estimated 70 to 80 percent of the Forest is currently the same approximate age (70-100 years) with similar stand conditions. Conversely, there are relatively few forest stands in younger age conditions. The effects of an aging forest include: 1) an increasing susceptibility to forest decline and mortality from insect and disease outbreaks; 2) a decrease in timber and mast productivity and wildlife habitat diversity; 3) an increase in shade-tolerant tree species; and 4) an increase in fuel loads from both down and standing dead trees that result in a higher potential of more severe fires during periods of extended or extreme drought. A mix of age classes across the Forest is more conducive to long-term sustainability and diversity to provide a variety of habitats and products in perpetuity. Forest management can affect the mix of age classes or successional stages by implementing regeneration harvests in those Management Prescriptions that allow or emphasize vegetation management. The amount and distribution of these Management Prescriptions vary by alternative, and therefore can be used to indicate the potential regeneration harvests and successional stage changes by alternative.

Indicator for Issue #1: Age class distribution by alternative.

Issue #2: Forest Plan management strategies may affect the potential for vegetation restoration in oak and spruce communities on the Forest. Oak communities are currently in decline due to changes in stand density, structure, and composition leading to a decreasing trend in vegetation diversity. In areas where fires helped perpetuate oak forests, decades of fire suppression have created conditions where oak species are not competing well with species such as striped and red maple and American beech. Light conditions in the mid-story are not suitable for oaks to regenerate. Timber harvest and prescribed fire can be used to mimic the effects of historic fire

regimes in areas where these activities are both allowed by Forest Plan direction and are considered ecologically appropriate.

Although red spruce has been slowly expanding its range over the past few decades, spruce and spruce-hardwood mixed forests once covered much more area than they do today. While opportunities for active restoration of the red spruce community are limited in suitable habitat for the West Virginia northern flying squirrel, there are areas where red spruce and mixed red spruce-hardwood forests could be actively managed to increase red spruce dominance.

This analysis focuses on the potential effects from management prescribed under each of the alternatives, and how that management may affect the diversity, sustainability, and general health of oak and spruce communities within the Forest.

Indicators For Issue #2:

- Acres of potential change in restoration of oak and spruce communities by alternative,
- Acres of Fire Regime I Condition Class 3 and Fire Regime III Condition Class 2 in MPs 3.0, 6.1, and 8.1 by Alternative.

Timber Supply

Issue: Forest Plan management strategies may affect the amount of land suitable for the sustainable harvest of timber products, the amount of timber offered by the Forest, and the methods used to harvest the timber. The 1897 Organic Act established national forests to furnish a continuous supply of timber to the nation and to protect watersheds. This direction remains today. The regulations implementing the National Forest Management Act require the Regional Forester to estimate the maximum amount of timber that can be sold annually on a sustained-yield basis. The Act also requires the identification of lands that are not suited for timber production.

Timber management on the Forest is primarily influenced by the allocation of Management Prescriptions (MPs), as some areas on the Forest are assigned prescriptions that allow or emphasize timber harvest, and others are not. Some of the MPs are considered not suitable for managing timber, and some include lands that are both suitable and unsuitable. The prescriptions with suitable lands also have desired conditions for vegetation that may affect the harvest methods used to achieve them. The range of alternatives proposed in this EIS have different allocations of MPs, and can be used to show relative differences in timber production and methods based on those allocations.

Indicators:

- Acres of land suited and not suited for timber management by alternative,
- Potential cubic board feet of Allowable Sale Quantity by alternative,
- Acres treated by harvest method by alternative.

Mineral Resources

Issue: Forest Plan management strategies may affect mineral resources available for exploration and development. Forest Plan direction for the management of mineral resources has been revised during the revision process. The overall result of these direction changes is that revised protection for and from mineral resource activities is much the same as in the 1986 Forest Plan, and desired conditions and goals for mineral management have improved.

The major effects to mineral management that this analysis assesses are related to Forest Plan Management Prescriptions (MPs). The MPs contain direction for mineral management that could potentially affect exploration and development. In particular, there is a standard that prohibits surface occupancy on federal gas and oil leases in several MPs that would restrict lease operators from exploring and developing gas reserves in all but the outer portions of the prescription unit areas. Because the MP allocation changes by alternative, the potential effects from the MP prohibition of surface occupancy would change as well. This analysis identifies how much gas production may be affected by alternative due to these changes.

Indicators:
- Percent of federally owned natural gas acres available for exploration and development,
- Billions of cubic feet of potential natural gas available for production from the MNF.

Recreation and Wilderness

Issue: Forest Plan management strategies may affect the amount of backcountry recreation areas offered by the Forest, including areas recommended for wilderness. The 1986 Forest Plan emphasizes backcountry recreation on about 124,500 acres of primarily semi-primitive non-motorized (SPNM) landscapes in a 6.2 MP. Over 78,000 acres of congressionally designated Wilderness (MP 5.0) also support this type of management emphasis. The combined MP 6.2 and 5.0 areas that emphasize backcountry recreation make up an estimated 22 percent of the Forest. This issue explores the question of whether the current mix of management emphasis associated with backcountry recreation is an appropriate amount and distribution across the Forest. It also looks at how much if any area should be added to that mix as recommended wilderness.

As one of the six decisions made in Forest Plan revision, the Forest re-inventoried its roadless areas in order to evaluate those areas for wilderness potential. The Roadless Area Inventory process looked at all existing MP 6.2 areas, Roadless Area Review and Evaluation (RARE II) areas, areas inventoried for the Roadless Area Conservation Rule and any area 5,000 acres or greater with less than ½ mile of improved road per 1,000 acres to determine if they qualified as Inventoried Roadless Areas. These areas provide the best opportunities for 6.2 management, as well as the best pool for potential Wilderness recommendations. As there are no recommended Wilderness areas in the 1986 Forest Plan, a new MP (5.1) was created for Forest Plan revision to represent Wilderness Study Areas.

Indicators:
- Acres of 6.2 and 8.1 MPs by alternative,
- Acres of MP 8.1 SPNM (backcountry recreation within the NRA) by alternative,

- Acres of 5.1 MP (Recommended Wilderness) by alternative,
- Total Acres of Backcountry Recreation opportunities (MPs 5.0, 5.1, 6.2, and 8.1 Semi-Primitive Non-motorized areas) by alternative,
- Recreation Opportunity Spectrum (ROS) Class distribution by alternative,
- Forest contribution to state-wide backcountry recreation opportunities by alternative.

Scenic Environment

Issue: Forest Plan management strategies may affect the scenic environment. The public has an interest in the Forest's scenery and how management activities may affect that scenery. Management activities have the potential for affecting scenic resources through vegetation management, restoration, or development activities. These activities could be implemented under any of the alternatives. Disturbance events of insect infestations and wildfire events can also affect scenic resources.

Indicators:
- Acres of even-aged harvest by alternative,
- Acres of intermediate treatment by alternative,
- Acres of prescribed fire use by alternative.

The potential for ecological disturbance events (insects, disease, wildfire) to affect the scenic environment is also discussed.

Road Transportation System

Issue: Forest Plan management strategies may affect the road transportation system and the public access the roads provide. Public interest in the roads within National Forests is increasing, and few natural resource issues in recent years have attracted as much public scrutiny as road management. Concerns linked to the roads within National Forests include public access, resource damage, habitat loss, maintenance capabilities, and economics. Yet some level of road development is needed to produce the goods and services that Americans expect from their National Forests.

Comments received both externally and internally reflected two main components: the number of amount of Forest roads that are developed, and the access they provide to the public. A number of comments focused on the amount of roads that should be maintained as part of the system. Comments were divided between those expressing the need to maintain current access and roads for resource management and recreation needs and those supporting a smaller road system to reduce impacts of roads on other resources. Some comments expressed concerned that overall access to the Forest was decreasing. Other comments expressed concern about concentrating public use on fewer and fewer acres, thus causing increased resource damage. Still other comments questioned the merits of reducing the road system in the face of expanding recreation use and access needs. Opposing comments favored a policy of "no new roads", especially in areas that are currently unroaded.

Indicators:
- Potential change in forest classified roads related to timber harvest by alternative,

- Potential change in public motorized access related to Management Prescription allocation by alternative.

Social and Economic Environment

Issue #1: Forest Plan management strategies may have social and economic effects on local counties and communities. Nearly all Forest management activities have the potential to directly or indirectly affect the socio-economic environment (chiefly counties and communities). These activities are related to, or could be implemented under, all alternatives.

Indicators for Issue #1: Indicators for this issue include local populations; lifestyles and social organization; attitudes, beliefs and values toward land use patterns; civil rights; employment, and income. Federal payments to counties in the form of 25 Percent Funds/Stabilized Payments and Payments in Lieu of Taxes (PILT) are also described.

Issue #2: Forest Plan management strategies may affect the financial efficiency of operating the National Forest. The financial efficiency of operating the National Forest is of great concern to the Forest Service and public alike. Controversy centers around such financial issues as "below-cost" timber sales and other "subsidized" activities on federal lands.

Indicators for Issue #2: The main indicator used in financial efficiency analysis is Net Present Value (NPV), in which discounted costs are subtracted from discounted values over a 50-year time period.

ALTERNATIVES

This section describes the management alternatives considered for Forest Plan revision. It also summarizes and compares the effects of those alternatives on the issues presented in the previous section. Maps of the alternatives considered in detail are included in the map packet for this document. Each map shows the Management Prescriptions for that alternative.

Only those alternatives that met the purpose and need, and addressed one or more of the major Need for Change issues were considered for detailed study. However, not all possible alternatives that met these criteria were carried into detailed study, as the list of options would have been prohibitively large. Instead, the Responsible Official identified those alternatives that met the criteria and created a reasonable range of outputs, direction, costs, management requirements, and effects from which to consider implementation options. Besides needing to meet the purpose and need and address one or more of the major issues, the alternatives considered in detail were further limited in their range by the following factors:

- There are over 78,000 acres in designated Wilderness that do not change by alternative.
- There are over 250,000 acres of habitat for federally listed species with management restrictions that do not change by alternative.
- There are over 60,000 acres of water, stream channel, wetlands, and associated buffer areas with management restrictions that do not change by alternative.
- There are over 70,000 acres of Special Areas (National Recreation Area, Botanical Areas,

Scenic Areas, research areas) that do not change by alternative.

- There are additional acres in eligible Wild and Scenic River corridors and Very High Scenic Integrity corridors with management restrictions that do not change by alternative.

These acres add up to over half of the Forest area, and they have the cumulative effect of reducing management options and narrowing the decision space on remaining Forest lands.

The alternatives considered but eliminated from detailed study are discussed below, followed by those alternatives considered for detailed study.

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by the National Environmental Policy Act (NEPA) to explore and objectively evaluate a reasonable range of alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail. Alternatives considered but eliminated from detailed study are described below, including a brief discussion of the reason or reasons for elimination.

No Logging/Commercial Harvest

Timber supply is one the major issues analyzed in this EIS, and the alternatives provide a reasonable range of expected commercial harvest. Timber harvesting is a tool necessary to move toward desired conditions stated in the Forest Plan, and therefore a no logging alternative would not meet the purpose and need for this proposal. The range of alternatives has various levels of harvest and degrees of restriction on commercial harvest, and the Preferred Alternative has an estimated 64 percent of the Forest in which no scheduled commercial timber harvest would occur. To analyze an alternative with no logging or commercial harvest would also be inconsistent with the authority provided by Congress, as Congress has clearly indicated that harvesting is allowed on National Forests.

Long Rotations and Individual Tree Selection

A comment on the Draft EIS and Proposed Plan suggested an alternative that would feature 200-300 year harvest rotations and limit timber harvest to individual tree selection across the Forest. The reason for this suggestion would seem to be to provide for an increase in old forest, which the Draft EIS states will increase under all four alternatives considered in detail. Although it has and can be used for many purposes on the Forest, individual tree selection would not achieve the intent of ecosystem restoration expressed in the purpose and need for this proposal, nor achieve the desired conditions for age class or habitat diversity expressed in the Revised Plan. Also, the 200-300 year rotations applied across the entire Forest would likely affect the Forest's ability to provide a sustainable level of timber product, another purpose of this proposal. Finally, we will be likely using individual tree selection and long rotations in some areas of the Forest (e.g., for spruce restoration, Indiana bat habitat, visually sensitive areas), but to apply the same prescription across the entire Forest would be ecologically inappropriate in many cases, and would not provide us with the management flexibility needed to address site-specific conditions and needs. For these reasons, this alternative was not developed and analyzed in detail.

Manage All of the Forest As Wilderness

An alternative that would manage the entire Forest as wilderness is beyond the scope of Plan revision to consider, as only Congress can designate wilderness. Also, the Forest Service, by law and policy, is a multiple-use agency that is mandated to manage numerous programs, many of which would be considered non-conforming uses in wilderness. The EIS alternatives do provide a reasonable range of backcountry areas and recommended wilderness to consider, but no alternative recommends that the entire Forest be managed as wilderness. Analysis of such an alternative is not required as it would not meet the purpose and need for the proposal, which is based in NFMA direction to develop an interdisciplinary multiple-use framework for future management of multiple-use resources

Do Not Manage Any of the Forest as Wilderness

An alternative that would not manage any of the Forest as wilderness is also beyond the scope of Plan revision to consider. There are currently over 78,000 acres of Congressionally designated wilderness on the Forest that must be managed as such by law. The EIS alternatives provide a range of recommended wilderness, including the No Action Alternative, which would not recommend any new wilderness for Congressional designation.

Maintain All Roadless Areas As Roadless

Some respondents to the NOI said that they wanted to see the Forest roadless areas maintained as roadless. Roadless areas have been inventoried on the Forest a number of times, the most recent being for Forest Plan revision. These areas are generally not roadless, as most have Maintenance Level 1 and 2 roads within them. However, they are managed to restrict public motorized use, commercial timber harvest, and road construction. The latest Inventoried Roadless Areas are given a mix of Management Prescriptions 5.1, 6.2, and 8.1 Semi-Primitive Non-Motorized in Alternatives 2 and 3. These prescriptions would maintain all of the Inventoried Roadless Areas in an undeveloped condition. Therefore, it was not necessary to develop and analyze this alternative in detail because the issue is addressed in other alternatives considered in detail.

Create More Early Seral Habitat

Although we have not developed an alternative that focuses solely on creating early seral habitat, all of the alternatives considered in detail would allow for the creation of early seral habitat to some degree. Successional stage amount and distribution is one of the indicators used to display differences in age class diversity across all alternatives.

No New Road Construction and Decommission Existing Roads

Some respondents wanted to see an alternative or alternatives that emphasize no new road construction and the decommissioning or elimination of all unneeded roads and/or roads harmful to the environment. The Wilderness Society, in a report it submitted to the Forest, called *Ecological and Financial Implications of Roads in the Monongahela National Forest* (Fleming et al. 2004), recommended that the Forest: “Ensure that there is no net increase in roads and no

new roads in unroaded blocks over 1,000 acres in size until the Forest Service has completed a thorough systematic determination of the minimum road system and identified the objectives for each road." Another recommendation in the report was to: "Consolidate roadless areas and increase the number of large unroaded blocks…by strategically decommissioning and obliterating roads adjacent to and between unroaded blocks." The report also suggested scenarios in which the Forest closes: 1) all of its local roads, or 2) all of its Maintenance Level 1 and 2 roads in order to reduce the costs of road maintenance.

The Responsible Official elected not to address road management to this detail in the revision process. Attempting to address specific road needs and impacts at the Forest-wide scale would not allow for the local considerations and prioritizations needed to effectively meet environmental, social, economic, and land management issues. Instead, the revision effort focused on providing a consistent broad-scale framework for conducting road planning and management at the watershed and project levels once the Plan is approved.

Travel Management

There were a large number of comments and suggestions related to Travel Management, including comments that the Revision effort should include revising the Forest's Travel Management Plan. However, travel management and allocation of travel "use" zones are not addressed through this forest plan revision process. Travel management will be revised in a separate, more localized, planning process.

The Responsible Official elected not to fully address travel management in this revision process due to the broad array of localized issues with travel management that occurs at scales below a Forest Planning unit. Attempting to address specific travel management issues at the scale of this revision effort would not allow for the localized modifications needed to effectively meet resource, social, and economic issues. However, the Responsible Official did believe that a consistent broad-scale framework for conducting localized travel management planning should be developed in forest plan revision.

This common broad-scale framework in all action alternatives was carried into detailed study and provided what was needed at this scale of analysis to address related Need for Change topics and other issues analyzed in detail. Therefore, alternative localized travel management strategies were not incorporated into revision alternatives considered for detailed study.

No Management Disturbance Above 4,000 Feet

Some respondents wanted to see an alternative or alternatives that eliminated management-related disturbance within areas above 4,000 feet in elevation. Land managers cannot completely eliminate all management-related disturbance on any part of the Forest, even wilderness. Some disturbance activities—such as trail maintenance, privately owned mineral development, cultural resource surveys, etc.—will and need to occur. However, we do have prescriptions that limit major disturbance activities, like road construction and timber harvest, and these are applied differentially across the alternatives in this EIS. We also developed a specific prescription, 4.1, that limits some management-related disturbances in high-elevation

areas on the Forest associated with spruce and spruce-hardwood ecosystems. Therefore, it was not necessary to develop and analyze this suggested alternative in detail.

No Management Within Riparian Areas

Some respondents wanted to see an alternative or alternatives that eliminated management-related disturbance within riparian areas. Again, land managers cannot completely eliminate all management-related disturbance in riparian areas, as these areas support many other mandated uses and facilities on the Forest, such as campgrounds, gas pipelines, and essential road corridors. However, we have management direction that limits certain management-related disturbances in riparian areas and promotes the removal, rehabilitation, or restoration of uses and facilities in these sensitive areas where appropriate. Therefore, it was not necessary to develop and analyze this suggested alternative in detail.

No Management on Areas with Severe Erosion Potential

One respondent wanted to see an alternative that eliminated management-related disturbance on areas with severe erosion potential, as defined by the Forest's soil erosion sensitivity map. Land managers cannot completely eliminate all management-related disturbance on any part of the Forest, including areas with severe erosion potential. We have also conducted management activities in areas with severe erosion potential in the past without measurable adverse effects. The key to operating on sensitive soils is to limit the amount and time of soil exposure to forces of erosion so that the soil does not erode and move off site. We have Forest-wide management direction designed to limit soil exposure and movement, and we can apply additional mitigation measures at the project level if there is an identified need. Therefore, it was not necessary to develop and analyze this suggested alternative in detail.

Custodial Management

One respondent wanted to see an alternative that featured custodial management with greatly reduced levels of timber production (5 million board feet), road building, mining, grazing, prescribed fire, or other management-related disturbance. This alternative would be designed to reduce disturbance to natural resources and provide more of the Forest for old growth, backcountry recreation opportunities, and wilderness experiences.

This alternative was not developed or analyzed in detail for the following reasons:

- We would not likely meet the Purpose and Need for plan revision with a proportionate mix of goods, services, and opportunities,
- We would not approach achieving our desired conditions or goals for vegetation management,
- All of the alternatives considered in detail have management direction and prescriptions that would reduce disturbance to natural resources,
- We already have an alternative that provides an abundance of backcountry recreation opportunities and potential wilderness experiences, and
- To base an entire alternative around an arbitrary harvest production number like 5 MMBF would be unreasonable because, as explained in the EIS (see Timber and Social and

Economic Environment sections), we cannot predict the exact amount of timber volume we will produce in any given year due to many variables. Instead, we use ASQ as the maximum amount of timber that could be produced by alternative to indicate the maximum amount of effects that could occur from timber management, and to show differences in alternatives based on suited acres available for harvest, harvest constraints, and our ability to achieve desired conditions for vegetation management.

Reduce Deer and Deer Impacts

This alternative would have the Forest reduce deer populations and associated impacts from deer grazing on tree regeneration, rare plant communities, and wildlife habitat. The management of deer in West Virginia is a cooperative undertaking with the State Division of Natural Resources. The Forest works with the Division to provide or restrict access during deer hunting season, or restrict access to reduce disturbance during other times of the year. To develop an alternative focused upon one very narrow wildlife issue for management of a multiple-use National Forest would not meet the purpose and need of revising the Forest Plan. The effects at the programmatic level of various alternatives on deer populations are disclosed in the FEIS.

Recommend All Inventoried Roadless Areas as Wilderness

An alternative that would recommend all Inventoried Roadless Areas (IRAs) as designated wilderness was considered but eliminated from detailed study. All IRAs were evaluated for wilderness potential, and the Responsible Official considered the evaluations in approving a range of recommended wilderness for the alternatives. Under Alternative 3, the majority of the IRAs are assigned a 5.1 (Recommended Wilderness) prescription, and the rest are assigned a 6.2 (Backcountry Recreation) prescription. Under the preferred alternative, all of the IRAs would be assigned either a 5.1, 6.2, or 8.1 Semi-Primitive Non-Motorized prescription. Management under these prescriptions would essentially maintain wilderness attributes over the planning period, and thus preserve options for Congressional designation in the future.

Benchmark Alternatives

Several “benchmark” alternatives were developed during analysis for the Forest Plan revision. Benchmarks represent maximum production potentials for various resources and uses. Benchmarks were developed for maximum timber production, maximum early-successional habitat, maximum present net value of market values, etc. The benchmark alternatives were eliminated from detailed consideration because they would not provide the mix of resource protection and management. The National Forest Management Act, Multiple-Use Sustained-Yield Act, Endangered Species Act, and other laws and Forest Service policy require that national forests be managed for a variety of uses as well as resource protection.

Alternatives Considered In Detail

The Revision Team developed and analyzed in detail five management alternatives for Forest Plan revision. In the descriptions of these alternatives that follow, numbers for Management Prescriptions, road miles, acres of timber harvest, etc. are all best estimates based on the latest

available information. The modeling and analyses conducted for this EIS were designed to indicate relative differences between the alternatives rather than predict absolute amounts of activities, outputs, or effects.

Alternatives are described in terms of their dominant themes, and their descriptions identify the issue(s) considered in alternative development and the approach taken by the alternative to address those issues. It is important to remember that not all alternatives address or resolve all issues. Alternatives are also described by their mix of management emphasis and prescriptions, particularly as they relate to:

- Vegetation diversity and restoration opportunities,
- Suitable timberlands and available timber supply,
- Backcountry recreation opportunities, including recommended wilderness, and
- Soil and water concerns.

Elements Common to All Alternatives

The alternatives considered in detail all have elements in common. For instance, they meet the Purpose and Need of this action, and they address the major issues to various degrees. They share the same affected areas within and surrounding the Forest boundaries, and comply with federal and state laws and regulations. In addition, these alternatives are comprised of various combinations of the Management Prescriptions described below. Each alternative has a table showing acres and percents of MP allocations for that alternative.

Management Prescriptions

Management Prescriptions (MPs) were assigned to National Forest System lands based roughly on category descriptions that the Forest Service has developed at the national level. The MPs represent management emphasis themes, ranging from areas with little or no development, such as Designated Wilderness (5.0) or Recommended Wilderness (5.1), to areas where a relatively high degree of development may be expected over time, such as Developed Recreation (7.0) or Age Class Diversity (3.0). Different combinations of MPs were assigned to alternatives to reflect the overall management themes and relative differences in the management emphasis of those alternatives. MPs are described below.

2.0 – Uneven-aged Timber Management. This prescription applies to areas suitable for hardwood timber production. They generally have slopes less than 60 percent and no factors limiting management of the area or reforestation efforts. The timber types must be suitable for management by the uneven-aged silvicultural system. A relatively high degree of activity typically occurs, including roads open to public use, recreation areas, mineral exploration, grazing allotments, and special use permits. This prescription is considered suited timberland, and forest products are provided through active management.

3.0 – Age Class Diversity. This prescription applies to lands managed primarily to create and maintain a variety of forest age classes to provide sustainable forest products and a range of recreational settings, visual landscapes, and wildlife habitat. This prescription is considered suited timberland, and forest products are provided through active management.

4.0 – Conifer Management. This prescription applies to lands that are dominated by existing conifer or mixed hardwood-conifer stands. It emphasizes a variety of coniferous forest views, a primarily motorized recreational environment, wildlife habitat and species associated with conifers, and production of softwood trees for fiber and lumber. This prescription is considered suited timberland, and forest products are provided through active management.

4.1 – Spruce and Spruce-Hardwood Restoration. This management prescription focuses on restoration and management of the red spruce and spruce-hardwood communities on the Forest. This prescription emphasizes passive and active restoration of spruce and spruce-hardwood communities, research on spruce restoration, recovery of community-related species of concern, and more active management of hardwood communities where the spruce component is negligible or absent. The portion of this prescription outside of suitable habitat for West Virginia northern flying squirrel is generally considered suited timberland.

5.0 – Designated Wilderness. This prescription applies to lands that are designated by Congress as Wilderness. The main management emphasis is preserving wilderness attributes, including natural appearance, natural integrity, opportunities for solitude, opportunities for primitive recreation, and identified special features. The area is managed to allow natural processes to prevail, with little or no evidence of human development.

5.1 – Recommended Wilderness. This prescription applies to lands that the Forest Service recommends for Wilderness designation. The primary management emphasis is to maintain wilderness attributes until Congress decides to designate the areas as wilderness or release them to some other form of management. Although these areas do not fall under the authority of the Wilderness Act, they are managed to maintain wilderness attributes where feasible, and to generally allow natural processes to prevail.

6.1 – Wildlife Habitat Emphasis. This prescription applies to lands where vegetation management emphasizes wildlife habitat diversity and sustainable mast production. Generally low levels of disturbance for wildlife and fish species are provided through access restrictions and a network of security areas. The recreational setting is primarily non-motorized, though some areas are open for motorized opportunities. This prescription is considered suited timberland, and forest products are provided through active management.

6.2 – Backcountry Recreation. This prescription applies to lands that emphasize a semi-primitive, non-motorized setting with a variety of dispersed recreation opportunities. The area has a natural-appearing environment with relatively little sign of management-related disturbance. This prescription is considered not suited for timber production, and programmed timber harvest is not expected to occur.

6.3 – Indiana Bat Habitat. This prescription was developed for the 2004 Threatened and Endangered Species Forest Plan Amendment to provide specific management direction for the primary ranges of Indiana bat. This direction promotes bat habitat maintenance or enhancement, reduces disturbance to bats and important habitat features, and is applied as an overlay to all

other prescriptions except 5.0, 6.2, and 8.0. This prescription only exists for Alternative 1, No Action. For the Action Alternatives the 6.3 prescription was replaced by Forest-wide direction.

7.0 – Developed Recreation. This prescription applies to lands where developed recreation is the primary emphasis. These lands are typically characterized by substantial recreation-related infrastructure and capital investment. Facilities are maintained, and both motorized and non-motorized recreation opportunities may be provided. Multiple uses—such as timber harvest, mining, and grazing—are typically restricted where they may compromise recreation values. Human use and presence are obvious. The areas may have a substantially modified natural environment. Vegetative treatments may occur to achieve desired conditions and to reduce the risk of impacts from insects, diseases, and fire on recreation settings and developments.

8.0 – Special Areas. This prescription applies to lands that emphasize the preservation of special ecosystems, areas for scientific research, or areas with national significance. The areas included in this prescription are scattered throughout the Forest and are of various sizes. Their special characteristics are recognized by a variety of administrative designations. Areas in this prescription include Botanical Areas, Scenic Areas, National Natural Landmarks, candidate Research Natural Areas, the Fernow Experimental Forest, Grouse Management Areas, and the Spruce Knob – Seneca Rocks National Recreation Area (NRA).

Wilderness

The Forest currently has five Congressionally designated Wildernesses: Dolly Sods, Otter Creek, Cranberry, and Laurel Fork East and West. These areas do not vary by alternative.

Eligible Wild and Scenic Rivers

The Forest currently has 12 river segments that are considered eligible for inclusion in the National Wild and Scenic River System. These eligible rivers do not vary by alternative. Although the river corridors do not have their own MP, the corridor areas have been removed from the suitable timber base where they occur in MPs that have lands considered suitable.

Special Areas

The Forest currently has many Special Areas (National Recreation Area, Botanical Areas, Scenic Areas, Natural National Landmarks, Fernow Experimental Forest, etcetera) that do not vary by alternative. Under Alternative 3, part of the NRA would be assigned a Recommended Wilderness (5.1) Management Prescription, but this portion would still be part of the NRA.

.Alternative 1 (No Action)

This is the No Action Alternative that provides the baseline for the effects analysis in the EIS. “No Action” means continuing current management of the Forest, while updating Forest Plan direction from six Forest Plan amendments that have occurred since 1986. Alternative 1 does not attempt to address Need for Change topics described in Alternative 2.

The Threatened and Endangered Species Amendment (2004), resulted in substantial changes to the management direction and prescriptions as depicted in the 1986 Plan. The amendment created a new 6.3 Management Prescription (MP) area to represent the primary ranges of Indiana bat. The 6.3 MP is over 136,000 acres and has direction with specific restrictions on a wide range of management activities.

The amendment also identified Opportunity Area (OA) 832 to represent suitable habitat for West Virginia northern flying squirrel. OA 832 area was listed in the 1986 Plan as part of the 8.0 prescription, but no specific area, acreage, or management direction was associated with it. The amendment OA 832 area is over 117,000 acres, and has specific restrictions on vegetation management and other activities.

The amendment stated that the 6.3 and OA 832 prescriptions were to be used as overlays of management direction on existing management prescriptions (except for MPs 5.0, 6.2 and 8.0), rather than as replacement prescriptions. The original MPs, prior to the amendment, are shown on a map in the map packet. However, overlaying this direction on the existing 3.0 and 6.1 prescriptions fundamentally changes the way the Forest is able to manage those 1986 MPs. The management emphasis shifts from age class diversity and timber production in 3.0, or wildlife habitat emphasis with timber production in 6.1, to enhancing bat habitat in 6.3, and little or no vegetation management in OA 832. Therefore, the 6.3 and OA 832 areas are shown as replacement or new MPs for Alternative 1 (see Alternative 1 map in map packet). Alternative 1 as depicted here and in the map packet is the No Action Alternative that will be analyzed in Chapter 3 of the EIS.

The Major Issues and the Management Prescriptions

Management prescriptions that appear in Alternative 1 in the map packet represent the 1986 Forest Plan as amended, and they are somewhat different than the prescriptions used in the Action Alternatives (2-4) and described in the Revised Plan. Alternative 1 has MPs 2.0, 4.0, 6.3, 7.0, and OA 832, which are not used in Alternatives 2-4. Alternative 1 does not have MPs 4.1, 5.1, and 8.1 (the NRA), which are used in Alternatives 2-4. Displayed as a percent of the Forest, the major management prescriptions under Alternative 1 are:
6.1 – Wildlife Habitat Diversity (31.8 percent)
3.0 – Age Class Diversity (15.0 percent)
6.3 – Indiana Bat Primary Range (14.9 percent)
8.0 – Special Areas (14.2 percent)
6.2 – Backcountry Recreation (13.6 percent)
5.0 – Designated Wilderness (8.6 percent)
2.0 – Uneven-aged Management (1.5 percent)

Vegetation Management – Management is focused in two Management Prescriptions, 6.1 and 3.0. Two other prescriptions (2.0 and 4.0) are considered suitable for timber production, but they are very small in size and have not been utilized extensively since the 1986 Plan was released. Although the 6.1 and 3.0 MPs are somewhat different in emphasis and direction, they have been managed somewhat differently than predicted in the 1986 Plan. In many cases, Forest managers have found that 6.1 areas were more suited to 3.0 silvicultural prescriptions, and have applied

more clearcutting with reserve trees and two-aged treatments in 6.1 than 3.0. Overall, vegetation management has included a high percentage of commercial thinning, shelterwood, and two-aged cuts, with a very low percentage of complete overstory removal or clearcuts. Timber management has not achieved the age class diversity predicted in the 1986 Plan, and there has been little or no emphasis on vegetation restoration.

Also, there is currently an annual allowance of up to 6,000 acres treated by timber harvest and 300 acres treated by prescribed fire due to the USDI Fish and Wildlife Service's Biological Opinion and Incidental Take Statement (March 2002) for the Threatened and Endangered Species Amendment to the Forest Plan. It is estimated that timber harvest and prescribed fire levels will not need to exceed the annual allowances in the Incidental Take Statement.

Timber Supply – There are an estimated 332,200 acres of suited timberlands (36 percent of the Forest) in this alternative, and the maximum timber volume to be produced from those acres is estimated at 10.8 MMCF (65 MMBF) per year. Management Prescriptions associated with suited timberlands (2.0, 3.0, 4.0, 6.1, 6.3) represent the most likely areas where localized harvest-related activities may occur. Within these MPs, however, are many areas where timber production will not occur on a regulated basis, including roads, waterways, stream channel and wetland buffers, recreation and administrative sites, cultural resource sites, mining sites, habitats for listed species, extremely steep or rocky areas, and areas that have restricted access.

Backcountry Recreation - Management Prescriptions that emphasize undeveloped recreation (6.2, 5.0) comprise an estimated 22 percent of the Forest. No areas would be recommended for wilderness (MP 5.1) under Alternative 1, as no areas were recommended in the 1986 Forest Plan. Existing Wildernesses are managed to preserve wilderness values. The 6.2 areas are managed as remote backcountry in a Semi-Primitive Non-Motorized setting, although roads exist in many areas and can be used for administrative access.

Water and Soil – Management Prescriptions that would have low potential for management-related disturbance to soil and water resources (5.0, 6.2, and 8.0, including WVNFS suitable habitat) comprise an estimated 36 percent of the Forest. Other lands considered unsuited for commercial timber production (Stream buffer zones, scenic corridors, etc.) comprise another 26 percent of the Forest. Additional inventory, mitigation, and monitoring may also be applied in areas where management actions have the potential to contribute to soil nutrient depletion related to acid deposition concerns. Riparian Management Guidelines were developed in 1999 to be used as project-specific mitigation on the Forest but were never officially incorporated into Forest Plan direction.
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Twelve river segments are considered eligible for National Wild and Scenic River designation. None of the river segments would be recommended for designation at this time, but they would remain eligible for future designation. Their free-flowing status and visual quality would be managed and protected under a Wild classification until a suitability study determined they were no longer eligible, or they were recommended to Congress for designation. At present, most of the segments do not meet Wild classification criteria.

Table S-1 shows acres of MPs by Forest for Alternative 1. See Alternative 1 Map, in the EIS map packet, for MP spatial distribution. Acres are rounded off to the nearest hundred.

Table S-1. Management Prescription Acres for Alternative 1

Number	Management Prescription	Acres	Percent of Forest
2.0	Uneven-aged Management	13,700	1.5
3.0	Age Class Diversity	137,000	15.0
4.0	Conifer Management	400	0
4.1	Spruce and Spruce-Hardwood Restoration	0	0
5.0	Designated Wilderness	78,700	8.6
5.1	Recommended Wilderness	0	0
6.1	Wildlife Habitat Diversity	284,400	31.8
6.2	Backcountry Recreation	124,500	13.6
6.3	Indiana Bat Primary Range	136,100	14.9
7.0	Developed Recreation	1,100	0.1
8.0	Special Areas*	130,500	14.2

*An estimated 89% of this prescription is Opportunity Area 832, a zoological area, which represents suitable habitat for the West Virginia northern flying squirrel, as applied in the T&E Amendment to the 1986 Plan.

Alternative 2

The main intent of Alternative 2 is to address Need for Change topics that initiated Forest Plan revision. A basic assumption under this alternative is that some management emphasis and direction across the Forest should be adjusted to address Need for Change topics. The Need for Change topics are described below, along with how they are addressed. Some features of Alternative 2 represent little change or maintain the status quo relative to the No Action Alternative. For example, recreation uses and opportunities stay much the same, as do rangelands considered suitable for livestock grazing. For a more detailed description and comparison of changes from No Action to Proposed Action, see the Comparison of Alternatives section.

Major Need For Change Topics

Vegetation Management – The Need for Change identified for this topic was:

- Provide direction for desired species composition and age classes of forest communities, and distribution across the landscape. This direction should include consideration for the diversity of wildlife habitats that these communities provide, from openings to old forests.

Direction for desired species and age classes was provided at the Forest-wide and MP levels. This direction emphasizes diversity across the landscape for forest ecosystems and the habitats they provide. This direction would apply to all alternatives but would vary somewhat between alternatives depending on the allocation of Management Prescriptions.

- Provide direction that will allow for long-term forest health and sustainability, including restoration of declining communities, and the role of disturbances on the landscape.

Direction was provided for forest health and sustainability at the Forest-wide and MP levels. Forest-wide direction addresses age class distribution, non-native invasive species, rare plant communities, pest management, and fuels treatment to help maintain healthy and diverse forests. The 4.1 MP was created to help restore and maintain spruce and spruce-hardwood ecosystems. The 6.1 MP was updated to include an emphasis on restoration of oak-pine and oak-hickory communities, and an increased role for fire as a disturbance agent to help maintain desired conditions. This direction and these MPs would be applied to all action alternatives. The amount and location of MPs vary by alternative, depending on the alternative theme or emphasis.

- Update Forest-wide and Management Prescription direction to address appropriate silvicultural and resource protection methods.

- Develop direction to address the emerging concern of non-native invasive plant species.

- Develop direction to maintain or restore rare plants and communities, including Regional Forester Sensitive Species.

All of this direction was updated or developed and integrated across a variety of resource areas, and it would be applied equally to all action alternatives.

Backcountry Recreation – The Need for Change identified for this topic was:

- Update 6.2 MP direction as needed and consider adjusting allocations of 6.2 based on the roadless/wilderness evaluation, the Recreation Opportunity Spectrum, and a reasonable range of backcountry recreation opportunities for the Responsible Official to consider.

The 6.2 MP direction and allocations were updated to reflect national and regional direction. Land allocations were adjusted based on the roadless/wilderness evaluation. For this alternative, all lands that qualified as Inventoried Roadless Areas were given a 6.2 or 5.1 MP. Lands that did not qualify for the inventory, usually because of small size and/or development impacts, were given different prescriptions. An estimated 24,900 acres of 6.2 in the Spruce Knob–Seneca Rocks NRA were given a different prescription but will still be managed for backcountry recreation under a Semi-Primitive Non-Motorized (SPNM) ROS setting.

- Develop a new Management Prescription (5.1) for Recommended Wilderness, and provide a range of wilderness recommendations for the Responsible Official to consider.

The 5.1 MP was developed, and a range of recommended wilderness was provided across the alternatives based on an evaluation of wilderness potential. A new roadless area inventory was conducted to determine the best potential pool of wilderness potential on the Forest. This inventory becomes the new set of 6.2 MP areas under Alternative 2, except for four of the areas, which are recommended for Wilderness under the 5.1 MP.

Water and Soil – The Need for Change identified for this topic was:

- Review and update Riparian Management Guidelines that were developed in 1999 to be used as project-specific mitigation on the Forest. Incorporate into the revised Forest Plan as needed.

The 1999 Riparian Management Guidelines and other relevant sources of direction were reviewed and incorporated as needed into the revised Plan to provide for stream channel and wetland protection. A new section in the Forest-wide direction of the Revised Plan was created, and this direction would apply to all action alternatives, including Alternative 2.

- Update Forest-wide and Management Prescription direction to provide for adequate protection of soils, water quality, and fish habitat.

Forest-wide and MP direction was updated to provide for soil, water, and fish habitat protection. The Forest-wide soil and water direction was combined into one section with the stream channel and wetland direction described above. This direction would apply to all action alternatives.

- Address acid deposition and sedimentation concerns through additions to Forest-wide direction and monitoring. Analyze the EIS alternatives based on their potential to influence these concerns.

Additional direction and monitoring was created or incorporated to address acid deposition and sedimentation concerns. This direction and monitoring would apply to all action alternatives. The EIS alternatives are analyzed based on their potential to influence these concerns.

Although no alternative was solely developed to address these concerns, all alternatives have MPs (5.0, 5.1, 6.2, 8.0) that would reduce the potential for ground disturbance that could directly affect these concerns. The 4.1 MP was also developed as a means of limiting disturbance in high-elevation spruce and spruce-hardwood ecosystems where acid deposition on susceptible land types and sedimentation in trout stream headwaters is of particular concern. The 4.1 MP is applied to all action alternatives, although the amount and locations vary by alternative.

Timberland Supply – The Need for Change identified for this topic was:

- Revisit suitable lands determination, revise supply and demand estimations, and recalculate ASQ based on those changes.

Timberland capability and suitability were re-assessed for Forest Plan revision (see Timber Resources section, Chapter 3). This assessment applies to all alternatives, however suitability was further refined in the action alternatives through the allocation of MPs. Specific MPs (3.0, 4.1, and 6.1) contain suited timberlands, although each MP has a somewhat different emphasis for vegetation management. These MPs are applied to all action alternatives, but by differing amounts and locations. The ASQ was calculated for all of the alternatives based on timber suitability, MP allocations, and Forest-wide and MP direction constraints.

Minor Need For Change Topics

Need for Change was identified for a number of other topics as well. For the most part, these changes were initiated in Alternative 2 but apply to Alternatives 3 and 4 as well. They include:

- The Scenery Management System has replaced the Visual Quality Objective System.
- The Forest-wide Monitoring and Evaluation Plan has been updated.
- Heritage Resource direction has been updated to address program changes since 1986.
- Land acquisition priorities have been updated, and new lands acquired since 1986 have been given a Management Prescription.
- Fire management direction has been broadened to incorporate fire as a management tool.
- Management Indicator Species have been reviewed and changed where needed to better reflect a cause-effect relationship with management activities.
- The Forest Opportunity Areas have been replaced by an emphasis on watershed-based analysis and management.
- Editorial and formatting changes have been made to make the Plan easier to read, understand, and implement.
- A Species Viability Evaluation was completed to help ensure that viable populations of species are provided for under the Forest's multiple use management.
- Information on eligible Wild and Scenic Rivers was updated and incorporated into the Revised Plan, including a change to manage for the rivers' highest potential classification, as opposed to the "Wild" classification management strategy applied in the 1986 Plan.
- The Spruce Knob – Seneca Rocks NRA was given its own Management Prescription.
- MPs (1.1, 2.0, 4.0, 9.0) that were outmoded or not used to manage resources were eliminated.
- Forest Plan amendments were incorporated into the 2006 Forest Plan where appropriate.

The Major Issues and the Management Prescriptions

Management Prescriptions are somewhat different than those used in Alternative 1, which are described in the 1986 Forest Plan. MPs 2.0, 4.0, 6.3, and 7.0 are no longer used. Opportunity Area 832, representing West Virginia northern flying squirrel suitable habitat, has been replaced by MP 4.1. Forest lands within the NRA have been given a new MP, 8.1. Displayed as a percent of the Forest, the major MPs under Alternative 2 are:
6.1 – Wildlife Habitat Diversity (31.3 percent),
3.0 – Age Class Diversity (21.5 percent)
4.1 – Spruce and Spruce Hardwood Restoration (17.0 percent)
6.2 – Backcountry Recreation (10.6 percent)
5.0 – Designated Wilderness (8.6 percent)
8.0 – Special Areas (8.0 percent)
5.1 – Recommended Wilderness (3.0 percent)

Vegetation Management – Specific desired conditions, goals, and objectives for age class diversity, species composition, and vegetation components were developed at the Forest-wide and Management Prescription levels. Management Prescriptions 2.0 and 4.0 were determined to be unnecessary and were eliminated. Prescriptions areas for 6.1 and 3.0 were shifted around

somewhat to better reflect the potential for different types of vegetation management. MP 6.1 was revised, and MP 4.1 was created to emphasize restoration of declining or recovering forest communities. These MPs comprise an estimated 48 percent of the Forest. Forest-wide direction was created to address non-native invasive species and rare plants and communities, with the intent to enhance the diversity and sustainability of forest ecosystems. There is currently an annual allowance of up to 6,000 acres treated by timber harvest and 300 acres treated by prescribed fire due to the USDI Fish and Wildlife Service's Biological Opinion and Incidental Take Statement (March 2002) for the Threatened and Endangered Species Amendment. It is estimated that timber harvest levels will not exceed the annual allowance in the Incidental Take Statement. However, the Forest is proposing to increase the prescribed fire allowance to 30,000 acres per decade (an average of 3,000 acres a year).

Timber Supply – There are an estimated 330,300 acres of suited timberlands (36 percent of the Forest) in this alternative, and the maximum timber volume to be produced from those acres is estimated at 10.5 MMCF (63 MMBF) per year. Management Prescriptions that have suited timberlands within them (3.0, 4.1, 6.1) represent the most likely areas where localized harvest-related activities may occur. Within these MPs, however, are many areas where timber production will not occur on a regulated basis, including roads, waterways, stream channel and wetland buffers, recreation and administrative sites, cultural resource sites, mining sites, some habitats for listed species, extremely steep or rocky areas, and areas that have restricted access.

Backcountry Recreation - Management Prescriptions that emphasize undeveloped recreation (6.2, 5.0, 5.1, SPNM portions of the NRA) comprise an estimated 25 percent of the Forest. Four areas (3 percent of the Forest) are recommended for wilderness study (MP 5.1): Cheat Mountain, Cranberry Expansion, Dry Fork, and Roaring Plains West. They will be managed to maintain their wilderness potential. Existing Wildernesses are managed to preserve wilderness values. The 6.2 areas are managed as remote backcountry in a Semi-Primitive Non-Motorized setting, although roads exist in many areas and can be used for administrative access.

Water and Soil – Management Prescriptions that would have low potential for management-related disturbance to soil and water resources (5.0, 5.1, 6.2, 8.1 SPNM, 8.2, 8.3, 8.4, 8.5) comprise an estimated 25 percent of the Forest. Other lands considered unsuited for commercial timber production (T&E species habitat, stream buffer zones, scenic corridors, etc.) comprise another 37 percent of the Forest. Additional inventory, mitigation, and monitoring may also be applied in areas where management actions have the potential to contribute to soil nutrient depletion related to acid deposition concerns.

Table S-2 shows acres of MPs by Forest for Alternative 2. See Alternative 2 Map, in the EIS map packet, for MP spatial distribution. Acres are rounded off to the nearest hundred.

Table S-2. Management Prescription Acres for Alternative 2

Number	Management Prescription	Acres	Percent of Forest
3.0	Age Class Diversity	196,900	21.5
4.1	Spruce and Spruce-Hardwood Restoration	155,700	17.0
5.0	Designated Wilderness	78,700	8.6
5.1	Recommended Wilderness*	27,700	3.0
6.1	Wildlife Habitat Diversity	286,600	31.3
6.2	Backcountry Recreation	97,500	10.6
8.0	Special Areas	73,600	8.0

*Recommendations for Wilderness under any alternative are preliminary administrative recommendations only. Any recommendation would receive further review and possible modification by the Chief of the Forest Service, the Secretary of Agriculture, and the President of the United States. Congress has reserved final decisions to designate Wilderness to the National Wilderness Preservation System.

Alternative 2 Modified (2M)

This alternative is a modified version of Alternative 2 in the DEIS. The modifications are a direct result of comments received on the DEIS and Proposed Revised Forest Plan. Management direction changes to the Proposed Revised Forest Plan have been applied to the 2006 Revised Forest Plan and now pertain to all of the action alternatives (2, 2M, 3, and 4) Management prescription changes to Alternative 2 have only been applied to Alternative 2M. We chose to create a new alternative for the FEIS so that the reader could easily see the degree of change between Alternative 2, the proposed action and preferred alternative in the DEIS, and Alternative 2M, the preferred alternative in the FEIS. The Management Prescription changes between Alternative 2 and Alternative 2M are briefly described below.

MP Changes as a Result of Comments on the Draft EIS

1) The area surrounding the Big Run Bog National Natural Landmark changed from MP 6.1 to MP 4.1 to reflect the high percentage of conifer and potential West Virginia northern flying squirrel habitat in the area. Big Run Bog remained an 8.2 National Natural Landmark.

2) The Weiss Knob area changed from MP 6.1 to MP 4.1 to reflect the high percentage of conifer and potential West Virginia northern flying squirrel habitat in the area.

3) The area around Haystack Knob/Hoffman Ridge changed from MP 6.1 to MP 5.1, part of the Roaring Plains West area recommended for wilderness study. Due to a mapping error in the Draft EIS, this area was incorrectly colored and labeled as MP 6.1, even though the acres of the area were included in the acreage of the Roaring Plains West MP 5.1.

4) The spruce portion of Barlow Top changed from MP 3.0 to MP 4.1 to reflect the high percentage of conifer and potential West Virginia northern flying squirrel habitat in the area.

5) The Pike Knob area changed from MP 6.1 to MP 8.5 (Candidate Research Natural Area) to better preserve and study the assemblage of rare plants and plant communities in the area.

6) The Lower Laurel Fork area changed from MP 6.1 to MP 6.2 to reflect the high recreational values of the area, including a river corridor that is currently considered eligible for inclusion in the Wild and Scenic River system. This corridor is classified as "Wild".

7) The Roaring Plains North area changed from MP 4.1 to MP 6.2 and was added to the Roadless Area Inventory to maintain its wilderness potential and attributes.

8) The Roaring Plains East area changed from MP 4.1 and MP 6.1 to MP 6.2 and was added to the Roadless Area Inventory to maintain its wilderness potential and attributes.

9) The Loop Road Research Area changed from MP 4.1 to MP 8.5 to protect the ongoing research studies in the area.

10) A small portion of the Dry Fork area changed from MP 5.1 to MP 6.1 in order to exclude an open road in this area that has been recommended for wilderness study.

The changes described above resulted in the following cumulative changes to Alternative 2M when compared to Alternative 2:

- MP 3.0 decreased approximately 1,800 acres
- MP 4.1 decreased approximately 1,200 acres
- MP 6.1 decreased approximately 8,200 acres
- MP 6.2 increased approximately 8,200 acres
- MP 8.0 increased approximately 2,900 acres.

The Major Issues and the Management Prescriptions

Management Prescriptions are similar to those in Alternative 2 but allocations are different. Displayed as a percent of the Forest, the management prescriptions under Alternative 2M are:

6.1 – Wildlife Habitat Diversity (30.3 percent),
3.0 – Age Class Diversity (21.3 percent),
4.1 – Spruce and Spruce Hardwood Restoration (16.9 percent),
6.2 – Backcountry Recreation (11.6 percent),
5.0 – Designated Wilderness (8.6 percent),
8.0 – Special Areas (8.3 percent),
5.1 – Recommended Wilderness (3.0 percent).

Vegetation Management – Management Prescriptions that emphasize restoration of vegetation conditions (4.1, 6.1) comprise an estimated 47 percent of the Forest. Forest-wide direction addresses non-native invasive species and rare plants and communities, with the intent to enhance the diversity and sustainability of forest ecosystems. It is estimated that timber harvest levels will not need exceed the annual allowance of 6,000 acres. However, to help achieve desired oak ecosystem restoration, the Forest is proposing to increase the prescribed fire allowance to 30,000 acres per decade (an average of 3,000 acres a year).

Timber Supply – There are an estimated 329,400 acres of suited timberlands (36 percent of the Forest) in this alternative, and the maximum timber volume to be produced from those acres is estimated at 10.5 MMCF (63 MMBF) per year. Management Prescriptions that have suited timberlands within them (3.0, 4.1, 6.1) represent the most likely areas where localized harvest-related activities may occur. Within these MPs, however, are many areas where timber production will not occur on a regulated basis, including roads, waterways, stream channel and wetland buffers, recreation and administrative sites, cultural resource sites, mining sites, some habitats for listed species, extremely steep or rocky areas, and areas that have restricted access.

Backcountry Recreation - Management Prescriptions that emphasize undeveloped recreation (6.2, 5.0, 5.1, 8.1 SPNM) comprise an estimated 26 percent of the Forest. Four areas (3 percent of the Forest) are recommended for wilderness study (MP 5.1). These areas are Cheat Mountain, Cranberry Expansion, Dry Fork, and Roaring Plains West. They are managed to maintain their wilderness potential. Existing Wildernesses are managed to preserve wilderness values. The 6.2 areas are managed as remote backcountry in a Semi-Primitive Non-Motorized setting, although roads exist in many areas and can be used for administrative and authorized access.

Water and Soil – Management Prescriptions that would have low potential for management-related disturbance to soil and water resources (5.0, 5.1, 6.2, 8.1, 8.2, 8.3, 8.4, 8.5) comprise about 27 percent of the Forest. Other lands considered unsuited for commercial timber production (T&E species habitat, stream buffer zones, scenic corridors, etc.) comprise another 36 percent of the Forest. Additional inventorying, mitigation, and monitoring may also be applied in areas where management actions have the potential to contribute to soil nutrient depletion related to acid deposition concerns.

The Table S-3 shows acres of MPs by Forest for Alternative 2 Modified. See Alternative 2M Map in the map packet for MP spatial distribution. Acres are rounded off to the nearest hundred.

Table S-3. Management Prescription Acres for Alternative 2 Modified

Number	Management Prescription	Acres	Percent of Forest
3.0	Age Class Diversity	195,100	21.3
4.1	Spruce and Spruce-Hardwood Restoration	154,500	16.9
5.0	Designated Wilderness	78,700	8.6
5.1	Recommended Wilderness*	27,700	3.0
6.1	Wildlife Habitat Diversity	278,400	30.3
6.2	Backcountry Recreation	106,800	11.6
8.0	Special Areas	76,500	8.3

*Recommendations for Wilderness under any alternative are preliminary administrative recommendations only. Any recommendation would receive further review and possible modification by the Chief of the Forest Service, the Secretary of Agriculture, and the President of the United States. Congress has reserved final decisions to designate Wilderness to the National Wilderness Preservation System.

Alternative 3

Alternative 3 emphasizes backcountry recreation opportunities and reduces management-related disturbance across the Forest. Recreation emphasis is on semi-primitive, non-motorized settings and opportunities. This alternative features the most Recommended Wilderness (5.1) and Backcountry Recreation (6.2) MPs of all the alternatives considered in detail. Vegetation management activities are similar to those prescribed for Alternative 2; however, they are limited in scope to a smaller suited timber base.

Issues Used to Develop this Alternative

Soil and Water Issue: Compared to the Proposed Action, Alternative 3 provides more emphasis on the passive conservation and restoration of soil, water, riparian, and aquatic resources by increasing MPs 6.2 and 5.1 by almost 200,000 acres across the Forest. Because these MPs have a very low potential for management-related disturbance activities (road construction, timber harvest, federal mineral leasing surface occupancy, recreation facility development), the potential for ground disturbance contributing to nutrient depletion and sedimentation concerns would be reduced.

Backcountry Recreation Issue: Compared to the Proposed Action, Alternative 3 substantially increases acres in MPs (5.0, 5.1, 6.2) that emphasize backcountry recreation opportunities. As noted above, this increase is nearly 200,000 acres. Alternative 3 also has the most recommended wilderness (99,400 acres) of all the alternatives considered in detail.

The Major Issues and the Management Prescriptions

Management Prescriptions are similar to those in Alternative 2 but allocations are different. Displayed as a percent of the Forest, the major MPs under Alternative 3 are:
6.2 – Backcountry Recreation (24.5 percent)
3.0 – Age Class Diversity (20.0 percent)
6.1 – Wildlife Habitat Diversity (19.4 percent),
5.1 – Recommended Wilderness (10.9 percent)
4.1 – Spruce and Spruce Hardwood Restoration (9.8 percent)
5.0 – Designated Wilderness (8.6 percent)
8.0 – Special Areas (6.6 percent)

Vegetation Management - Management Prescriptions that emphasize restoration of vegetation conditions (4.1, 6.1) comprise an estimated 29 percent of the Forest. MPs 6.1 and 4.1 emphasize restoration of declining or recovering forest communities. Forest-wide direction addresses non-native invasive species and rare plants and communities, with the intent to enhance the diversity and sustainability of forest ecosystems. Vegetation management has an annual allowance of up to 6,000 acres treated by timber harvest and 300 acres treated by prescribed fire due to the USDI Fish and Wildlife Service's Biological Opinion and Incidental Take Statement for the Threatened and Endangered Species Amendment to the Forest Plan. It is estimated that timber harvest and prescribed fire levels will not exceed the Take Statement annual allowances.

Timber Supply – There are an estimated 253,400 acres of suited timberlands (28 percent of the Forest) in this alternative, and the maximum timber volume to be produced from those acres is estimated at 8.3 MMCF (50 MMBF) per year. Management Prescriptions associated with suited timberlands (3.0, 4.1, 6.1) represent the most likely areas where localized harvest-related activities may occur. Within these MPs, however, are many areas where timber production will not occur on a regulated basis. These areas include roads, waterways, stream channel and wetland buffers, recreation and administrative sites, cultural resource sites, mining sites, some habitats for listed species, extremely steep or rocky areas, and areas that have restricted access.

Backcountry Recreation - Management Prescriptions that emphasize undeveloped recreation (5.0, 5.1, 6.2, 8.1 SPNM) comprise an estimated 46 percent of the Forest. This alternative features the most areas recommended for wilderness study (10.8 percent of the Forest). These areas are Big Draft, Cheat Mountain, Cranberry Expansion, Dry Fork, East Fork Greenbrier, Middle Mountain, Gaudineer, Seneca Creek, Spice Run, Roaring Plains West, and Turkey Mountain. They are managed to maintain their wilderness potential and undeveloped character. Recommended and existing wilderness comprise 19.4 percent of the Forest. Existing Wilderness areas are managed to preserve wilderness values. MP 6.2 areas are managed to maintain wilderness potential in Semi-Primitive Non-Motorized areas, although roads exist in many areas and can be used for administrative access.

Water and Soil – Management Prescriptions that would have low potential for management-related disturbance to soil and water resources (5.0, 5.1, 6.2, 8.1, 8.2, 8.3, 8.4, 8.5) comprise an estimated 46 percent of the Forest. Other lands considered unsuited for commercial timber production (T&E species habitat, stream buffer zones, scenic corridors, etc.) comprise another 25 percent of the Forest. Additional inventory, mitigation, and monitoring may also be applied in areas where management actions have the potential to contribute to soil nutrient depletion related to acid deposition concerns.

Table S-4 shows acres of MPs by Forest for Alternative 3. See Alternative 3 Map, in the EIS map packet, for MP spatial distribution. Acres are rounded off to the nearest hundred.

Table S-4. Management Prescription Acres for Alternative 3

Number	Management Prescription	Acres	Percent of Forest
3.0	Age Class Diversity	183,400	20.0
4.1	Spruce and Spruce-Hardwood Restoration	90,100	9.9
5.0	Designated Wilderness	78,700	8.6
5.1	Recommended Wilderness*	99,400	10.8
6.1	Wildlife Habitat Diversity	177,900	19.4
6.2	Backcountry Recreation	224,200	24.5
8.0	Special Areas	61,700	6.8

*Recommendations for Wilderness under any alternative are preliminary administrative recommendations only. Any recommendation would receive further review and possible modification by the Chief of the Forest Service, the Secretary of Agriculture, and the President of the United States. Congress has reserved final decisions to designate Wilderness to the National Wilderness Preservation System.

Alternative 4

Alternative 4 was developed to provide more emphasis on vegetation restoration. Management Prescriptions 4.1 and 6.1 are applied more liberally to the landscape to facilitate restoration of spruce, spruce-hardwood, oak-pine, and oak-hickory ecosystems. A full range of recreation experiences is available, and semi-primitive settings and opportunities are abundant, though not as much as in the other alternatives. No Inventoried Roadless Areas are recommended for Wilderness. Many of the areas with a 6.2 or 5.1 prescription under Alternatives 2 or 3 have a 4.1 or 6.1 prescription in this alternative to allow for more vegetation restoration.

Issues Used to Develop this Alternative

Vegetation Management Issue: Compared to Alternative 2, Alternative 4 reassigns acres from MP 6.2 that features backcountry recreation opportunities to MPs 4.1 and 6.1 that emphasize restoration of spruce-hardwood and oak ecosystems. This alternative provides the most potential for vegetation management of all the alternatives considered in detail.

The Major Issues and the Management Prescriptions

Management Prescriptions are similar to those in Alternative 2 but allocations are different. In terms of land acreage, the major Management Prescriptions under Alternative 4 are:
6.1 – Wildlife Habitat Diversity (33.9 percent),
3.0 – Age Class Diversity (22.1 percent)
4.1 – Spruce and Spruce Hardwood Restoration (21.8 percent)
5.0 – Designated Wilderness (8.6 percent)
8.0 – Special Areas (8.0 percent)
6.2 – Backcountry Recreation (5.6 percent)

Vegetation Management - Management Prescriptions that emphasize restoration of vegetation conditions (4.1, 6.1) comprise an estimated 56 percent of the Forest. Prescription areas for 6.1 and 3.0 were shifted around somewhat to better reflect the potential for different types of vegetation management. MPs 6.1 and MP 4.1 emphasize restoration of declining or recovering forest communities. Forest-wide direction addresses non-native invasive species and rare plants and communities, with the intent to enhance the diversity and sustainability of forest ecosystems. There is currently an annual allowance of up to 6,000 acres treated by timber harvest and 300 acres treated by prescribed fire due to the USDI Fish and Wildlife Service's Biological Opinion and Incidental Take Statement (March 2002) for the Threatened and Endangered Species Amendment. It is estimated that timber harvest levels will not exceed the annual allowance in the Incidental Take Statement. However, the Forest is proposing to increase the prescribed fire allowance to 7,500 acres to help achieve desired oak ecosystem restoration.

Timber Supply – There are an estimated 346,700 acres of suited timberlands (38 percent of the Forest) in this alternative, and the maximum timber volume to be produced from those acres is estimated at 13.3 MMCF (80 MMBF) per year. Management Prescriptions that have suited timberlands within them (3.0, 4.1, and 6.1) represent the most likely areas where localized

harvest-related activities may occur. Within these MPs, however, are many areas where timber production will not occur on a regulated basis. These areas include roads, waterways, stream channel and wetland buffers, recreation and administrative sites, cultural resource sites, mining sites, some habitats for listed species, extremely steep or rocky areas, and areas that have restricted access.

Backcountry Recreation - Management Prescriptions that emphasize undeveloped recreation (6.2, 5.0, 8.1 SPNM) comprise an estimated 17 percent of the Forest. This alternative would recommend no areas on the Forest for Wilderness study. Existing Wildernesses are managed to preserve wilderness values. The 6.2 areas are managed to maintain wilderness potential in roadless areas, although roads exist in many areas and can be used for administrative access.

Water and Soil – Management Prescriptions that would have low potential for management-related disturbance to soil and water resources (5.0, 6.2, 8.1, 8.2, 8.3, 8.4, 8.5) comprise an estimated 17 percent of the Forest. Other lands considered unsuited for commercial timber production (T&E species habitat, stream buffer zones, scenic corridors, etc.) comprise another 43 percent of the Forest. Additional inventorying, mitigation, and monitoring may also be applied in areas where management actions have the potential to contribute to soil nutrient depletion related to acid deposition concerns.

The following table shows acres of MPs by Forest for Alternative 4. See Alternative 4 Map, in the EIS map packet, for MP spatial distribution. Acres are rounded to the nearest hundred.

Table S-5. Management Prescription Acres for Alternative 4

Number	Management Prescription	Acres	Percent of Forest
3.0	Age Class Diversity	202,900	22.2
4.1	Spruce and Spruce-Hardwood Restoration	199,800	21.8
5.0	Designated Wilderness	78,700	8.6
5.1	Recommended Wilderness	0	0
6.1	Wildlife Habitat Emphasis	310,300	33.9
6.2	Backcountry Recreation	49,600	5.4
8.0	Special Areas	73,600	8.1

COMPARISON OF ALTERNATIVES

This section summarizes effects from the alternatives on the issue-related resources, in the same order they are presented in detail in Chapter 3 of the FEIS.

Air Quality

Indicators and Effects - Potential missions of PM and NOx from predicted timber harvest and prescribed fire activities were evaluated in comparison to total PM and NOx emissions in counties near the Forest. These results are in Table S-6.

Table S-6. Cumulative Emission Estimates for Management Activities on the MNF

Alternative	Pollutant	MNF Total Management Emissions (Tons per Year)	Total Regional Emissions (Tons per year)	Percent MNF Management Activities of Total Regional Emissions
Alternative 1	VOC	110.8	118,251	0.09%
	NO_x	91.2	212,477	0.04%
	PM	47.2	161,925	0.03%
Alternative 2	VOC	110.2	118,251	0.09%
	NO_x	141.1	212,477	0.07%
	PM	425.1	161,925	0.26%
Alternative 2 Modified	VOC	109.7	118,251	0.09%
	NO_x	83.7	212,477	0.04%
	PM	5.0	161,925	0.00%
Alternative 3	VOC	87.4	118,251	0.07%
	NO_x	72.2	212,477	0.03%
	PM	46.1	161,925	0.03%
Alternative 4	VOC	115.2	118,251	0.10%
	NO_x	229.8	212,477	0.11%
	PM	1,055.3	161,925	0.65%

Given that both prescribed fire and timber harvest emissions comprise such a small percentage of the regional pollution load, and the cumulative effects of these Forest management emissions are well below the 5 percent emissions threshold, the effects of these activities on air quality and regional haze should be minimal and should not violate National Ambient Air Quality Standards.

Soil Resource

Acres of potential timber harvest in suited MPs by alternative - Timber harvest numbers in Table S-7 are estimates from the Spectrum model of maximum activity that could occur given certain management constraints. Acres are annual averages for the next two decades.

Table S-7. Maximum Potential Timber Harvest Acres by Alternative

Activity	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Maximum Potential Acres – Conventional Yarding	3,445	2,853	2,826	2,638	3,498
Maximum Potential Acres – Helicopter Yarding	2,296	1,902	1,884	1,759	2,332
Maximum Total Acres Treated	5,741	4,755	4,710	4,397	5,830

Alternative 3 would have the least amount of timber harvest over the next two decades, followed in ascending order by Alternatives 2M, 2, 1, and 4. The risk for soil productivity losses would also be the least for Alternative 3, followed in ascending order by Alternatives 2M, 2, 1, and 4, based on both total harvest acres and conventional methods used to harvest those acres. The range of management direction and mitigation provided by the Forest Plan should be more than adequate to address soil resource concerns at the project level. Also, a well-defined monitoring plan of implementation would track and verify predicted effects, and allow specialists to adjust input and mitigation needs for future projects.

Percent of high-risk acid-sensitive soils by MP by alternative - Forty-one percent of the total acreage on the Forest is considered to be of high risk to acid deposition. Table S-8 shows the distribution of those high-risk acres by Management Prescription for each alternative.

Table S-8. Percent of High-Risk Acid Sensitive Geology Acres by MP

Alternative	Percent of High Acid Sensitivity Geology within Management Prescriptions										
	2.0	3.0	4.0	4.1	5.0	5.1	6.1	6.2	6.3	7.0	8.0
1	91%	38%	91%	0	61%	0	34%	41%	32%	78%	52%
2	0	35%	0	55%	61%	79%	31%	38%	0	0	33%
2M	0	35%	0	55%	61%	79%	32%	38%	0	0	34%
3	0	31%	0	51%	61%	41%	28%	48%	0	0	38%
4	0	36%	0	53%	61%	0	32%	48%	0	0	33%

For all alternatives, the areas on the Forest with the highest sensitivity to acid deposition and potential nutrient loss tend to fall in those MPs where little or no regulated timber harvest or road construction would occur. MPs 5.0, 5.1, 6.2, and large portions of MPs 4.1 and 8.0 would provide widespread protection related to the effects of acid deposition by greatly reducing the potential for soil disturbance and removal of soil nutrients. Conversely, the areas on the Forest with the lowest sensitivity to acid deposition and potential nutrient loss tend to fall in those MPs (3.0, 6.1) where regulated timber harvest or road construction could occur. The relatively low percentages of high sensitivity areas mean that there should be a relatively high percentage of

land available for management without potentially affecting soils that are highly sensitive to acid deposition and nutrient loss.

Watershed, Riparian, and Aquatic Resources

Suitable timber lands by alternative – MPs that permit a greater level of timber harvest are considered to have a greater potential to disturb water, riparian and aquatic conditions than those that limit timber harvest. Not all of the acres located within the MPs are suited or available for timber harvest. Table S-9 displays the suited timber lands by alternative.

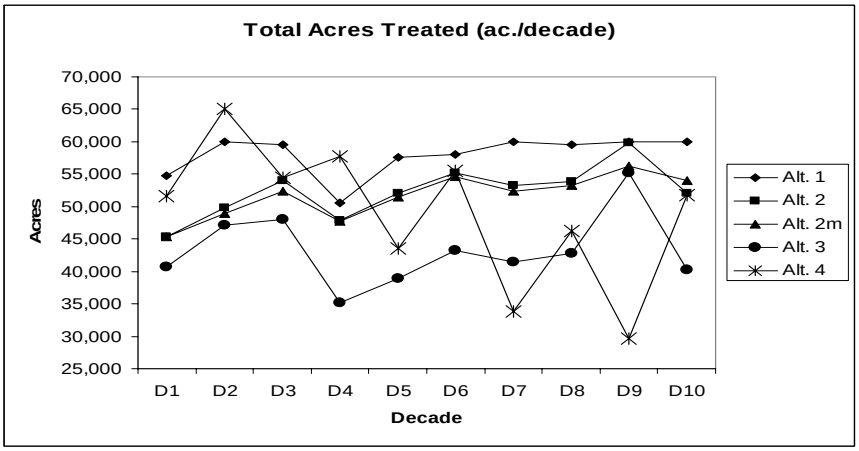
Table S-9. Lands Suited and Available for Commercial Timber Harvest

Indicator	Acres and Percent by Alternative				
	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Acres of Suitable Timber Lands	332,200	330,300	329,400	253,400	346,700
Percent of Forest Land Base	36%	36%	36%	28%	38%

In the Chapter 3 analysis, these acres are broken out by 31 fifth-level watersheds on the Forest. Alternative 3 has the lowest, or tied for lowest, potential impact in 19 of the 31 watersheds. Alternative 1 is next with 11 watersheds, and Alternative 2M, Alternative 2 and Alternative 4 follow in order, as they have the lowest level in 10, 9 and 8 watersheds respectively.

Acres, volume, and logging methods of potential timber harvest by alternative - Figure S-2 displays the long-term trends in maximum potential acres harvested on suited timber lands by alternative. Alternative 3 has the lowest estimated harvest activity in the first decade, followed in ascending order by Alternatives 2, 2M, 4, and 1. In subsequent decades, the potential level of activity shifts between alternatives. Alternative 3 maintains the lowest or second lowest level of potential treatment through all decades, while Alternative 1 remains the highest or second highest level through all decades.

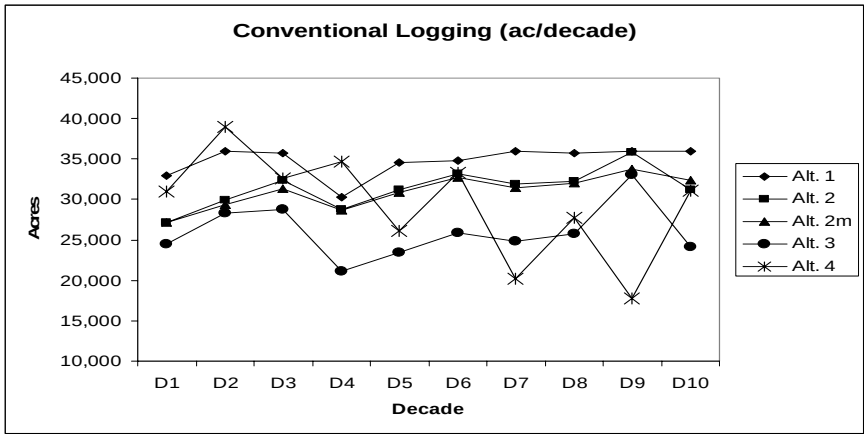
Figure S-2. Maximum Acres Potentially Harvested by Alternative per Decade



Harvest volume by alternative - Another way to look at potential effects from timber harvest is the allowable sale quantity (ASQ), which is a measure of the potential volume of timber harvested, reported as million board feet per year (MMBF/year). Alternative 3 has the lowest ASQ in the first decade and most of the subsequent decades. The ASQ for Alternative 3 remains at 50 MMBF through all decades. For the life of the plan, Alternative 4 has the highest ASQ at 80 MMBF and it remains at that level for the first four decades before dropping off. Alternatives 2, 2M, and 1 remain constant through the decades at 63, 63, and 65 MMBF, respectively. All of this volume is expected to come from lands outside of stream channel and wetland buffer zones, where shade and large woody debris needs would be met by management direction.

Logging methods by alternative - Vegetation modeling assumed that 60 percent of the total acres to be treated would be conventionally logged and 40 percent helicopter logged. Figure S-3 displays the projected acres of conventional logging by alternative. Alternative 3 has the lowest level of conventional logging during the life of the plan, followed by Alternatives 2, 2M, 4 and 1.

Figure S-3. Maximum Potential Acres Conventionally Logged by Alternative by Decade



We also modeled the proximity of potential harvest activities to the existing road system. Table S-10 displays the projected level of conventional harvest for each alternative in Decade 1, and the proximity to existing roads.

Table S-10. Potential Conventional Timber Harvest Acres by Alternative in Decade 1
(Figures represent maximum potential acres for the first 10-year period)

Activity	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Conventional Harvest Acres	32,893	27,178	27,203	24,458	30,944
Distance to Road: 0/0 to 3/8 mi.	24,219	25,649	25,142	22,848	25,886
Distance to Road: 3/8 to 6/8 mi.	6,529	1,425	2,061	1,057	4,270
Distance to Road: 6/8 to 9/8 mi.	1,045	80	0	553	500
Distance to Road: 9/8 mi. +	1,100	24	0	0	288
Total Distance Greater than 3/8 mile	8,674	1,529	2,061	1,610	5,028

The assumption is that acres within 3/8 mile of an existing road may be conventionally harvested without the need for road access that could result in additional road-related ground disturbance. If the distance is over 3/8 mile, new roads may be needed to access the units. Alternative 2 has the fewest overall acres that would need road access, followed by Alternatives 3, 2M, 4, and 1.

Summary - Implementation of Forest-wide standards and guidelines would minimize the potential direct, indirect, and cumulative effects of land management activities on NFS lands. Alternative 3 has the lowest potential for ground-disturbing activities associated with timber harvest activities, followed by Alternatives 2 and 2M, 4, and then 1.

Terrestrial Ecosystem Diversity

Indicators and Effects

Amount and development stages of major forested communities by alternative – Potential changes to development stages by forested community would follow similar patterns under all alternatives, although the amounts differ somewhat by alternative. The patterns and amounts are similar because: 1) development stages across all forested communities are currently dominated by mature stands, with relatively few young or old stands, and 2) over 60 percent of the Forest would receive little or no harvest treatments under any alternative, resulting in the aging of mature stands into old forest stands. Thus, the patterns or trends under all alternatives are:

- Old forest stands will increase,
- Mature forest stands will decrease,
- Young forest stands will increase where active management occurs, and
- Mature forest will recover somewhat over time as managed young stands grow older, but they will likely never achieve the amount and distribution they have currently.

The more even-aged regeneration harvest occurs, the more young development stage would be created. Alternative 4 would generally have the most even-aged regeneration harvest during the early decades of the planning horizon, and Alternative 1 would generally have more thereafter. Alternative 3 would have the least regeneration harvest and therefore the most old forest over time. Alternatives 2 and 2M would have amounts similar to but slightly less than Alternative 1.

Amount of each rare and unique community by alternative - Amounts of most rare and unique communities are not expected to change substantially from current amounts regardless of alternative (see Table S-11). Three communities occur on a larger scale and could change in area because of Forest Service management: high-elevation grasslands; woodlands, savannas, and grasslands; and remote habitat. Relative to the current amount, the amount of high-elevation grassland is projected to increase somewhat under all alternatives except Alternative 3, where it would decrease slightly. Woodlands, savannas, and grasslands are projected to approximately double under Alternatives 1, 2, 2M, and 4; it is projected to increase a little more than 40 percent under Alternative 3. These are considered maximum potential increases assuming desired conditions for maintained openings will be met.

Table S-11. Projected Amounts of Rare and Unique Communities in Future Decades Compared to Estimated Presettlement, 1935, and Current Amounts
(NFS land only. All amounts are acres unless otherwise noted. Amounts in bold are within the estimated presettlement range or within +/- 5 percent of the estimated presettlement amount.)

Community	Presettle-ment	1935	Current	Alt. 1	Alt. 2	Alt 2M	Alt. 3	Alt. 4
Bogs, fens, seeps, seasonal ponds	Unknown	Unknown	2,000	2,000	2,000	2,000	2,000	2,000
Open wetlands	Unknown	Unknown	1,000	1,000	1,000	1,000	1,000	1,000
Stream channels (miles)	3,000	**3,000**	**3,000**	**3,000**	**3,000**	**3,000**	**3,000**	**3,000**
Glades and barrens	2,000	**2,000**	**2,000**	**2,000**	**2,000**	**2,000**	**2,000**	**2,000**
Rock outcrops and cliffs	6,000	**6,000**	**6,000**	**6,000**	**6,000**	**6,000**	**6,000**	**6,000**
High-elevation grasslands	Unknown	22,000	14,000	17,000	16,000	16,000	13,000	18,000
Shrub balds	Unknown	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Caves/mines (entrances)	225	**225**	**225**	**225**	**225**	**225**	**225**	**225**
Woodlands, savannas, and grasslands	Unknown	40,000	7,000	15,000	14,000	14,000	10,000	15,000
Lakes and ponds	Unknown	Unknown	200	200	200	200	200	200
Total remote habitat	915,000	Unknown	190,000	200,000	220,000	240,000	410,000	150,000

Remote habitat would be most extensive under Alternative 3, increasing from the current estimated 190,000 acres to 440,000 acres. In contrast, remote habitat under Alternative 4 would decrease to an estimated 170,000 acres. Under Alternatives 1, 2, and 2M, remote habitat would increase by moderate amounts, to about 200,000, 220,000 and 240,000 acres, respectively.

Representation of ecological communities in Minimum Dynamic Area (MDA) reserves - The total amount of land contained in MDA reserves is highest in Alternative 3, which has 520,000 acres, or 57 percent of NFS land, in reserves (Table S-12). Total land in MDA reserves is lowest in Alternative 1 at 310,000 acres, or 34 percent of NFS land. Alternative 2 has 380,000 acres (42 percent of NFS land), Alternative 2M has 390,000 acres (43 percent of NFS land), and Alternative 4 has 360,000 acres (39 percent of NFS land) in reserves. Table S-13 shows the percentages of forested communities within MDA reserves by alternative. Percentages would increase under all alternatives, with the most increases occurring under Alternative 3.

Table S-12. Minimum Dynamic Area Reserves by Alternative

Indicator	Alternative 1 Existing Condition	Alternative 2	Alternative 2M	Alternative 3	Alternative 4
Number of MDA reserves	10	10	10	14	9
Total acres in MDA reserves	310,000	380,000	390,000	520,000	360,000
Percent of all NFS Land in MDA reserves	34%	42%	43%	57%	39%
Percent of all Land in Forest Boundary in MDA reserves	18%	23%	23%	30%	21%

Table S-13. Percent of Major Forested Communities within MDA Reserves[1]

Community	Percent of Current Community Amount on NFS Lands in MDA Reserves				
	Alt. 1 - Current Condition	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Spruce forest	95	97	97	97	97
Mixed mesophytic/cove forest	29	36	36	47	33
Northern hardwood forest	71	81	81	84	81
Hemlock forest	56	63	63	83	62
Oak forest	9	16	16	42	12
Pine-oak forest	12	22	22	64	16

[1]MDAs are blocks 10,000 acres or larger where even-aged management is prohibited or greatly limited.

Terrestrial Species Viability

Distribution of viability outcomes by alternative - As a measure of the aggregate level of risk to species viability, the numbers of A, B, C, D, and E viability outcomes were compared across the alternatives. Projected viability outcomes under the alternatives showed little change from current conditions (Table S-14). Each of the alternatives had 188 species with viability outcomes of C, D, or E, indicating low abundance and some degree of risk to viability. This is a net decrease of one species from the 189 species with C, D, or E outcomes under existing conditions. Considering just the higher-risk D and E outcomes, Alternatives 1 and 3 each had 128 species with these outcomes, whereas Alternatives 2, 2M, and 4 each had 127 species. These results show a slight projected improvement from the 129 species that currently have D or E outcomes. Compared to current conditions, Alternatives 1 and 3 each had three species with decreased risk to viability and one species with increased risk to viability, while Alternatives 2, 2M, and 4 each had four species with decreased risk and one species with increased risk. Table S-15 shows the species outcomes that differed from current conditions.

Table S-14. Viability Outcomes by Alternative and Comparison to Current Outcomes

Outcome	Number of Species With the Specified Outcome					
	Current	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
A	3	3	3	3	3	3
B	17	18	18	18	18	18
C	60	60	61	61	60	61
D	71	71	70	70	71	70
E	58	57	57	57	57	57
Insufficient Information	10	10	10	10	10	10
Number of species with decreased risk relative to current	--	3	4	4	3	4
Number of species with increased risk relative to current	--	1	1	1	1	1

Table S-15. Species with Projected Viability Outcomes that Differed from Current Conditions

Species	Viability Outcome					
	Current Condition	Alt.1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Birds						
Black-billed cuckoo	C	B	B	B	B	B
Yellow-breasted chat	C	B	B	B	B	B
Red-headed woodpecker	D	D	C	C	D	C
Mourning warbler	B	C	C	C	C	C
Invertebrates						
Diana fritillary[1]	E	C	C	C	C	C

[1]Regional Forester's Sensitive Species.

Effect determinations for Regional Forester's Sensitive Species by alternative - Currently there are 84 terrestrial species that are listed as RFSS on the Forest. Table S-16 summarizes their viability outcomes by alternative for RFSS.

Viability outcomes for RFSS showed no differences among alternatives, and only one RFSS had a viability outcome that differed from the current conditions. The outcome for this species, Diana fritillary, improved from E under the existing condition to C under all alternatives. For all RFSS, we have determined that each alternative may impact individuals, but is not likely to cause a trend toward federal listing or a loss of viability.

Table S-16. Summary of Viability Outcomes for RFSS

Viability Outcome	Number of RFSS With Outcome Shown					
	Existing Condition	Alternative 1	Alternative 2	Alternative 2M	Alternative 3	Alternative 4
A	0	0	0	0	0	0
B	2	2	2	2	2	2
C	13	14	14	14	14	14
D	26	26	26	26	26	26
E	41	40	40	40	40	40
Insufficient Information	1	1	1	1	1	1

Terrestrial Management Indicator Species and Other Species of Interest

Optimum habitat for cerulean warbler (MIS) – area of mid-late and late successional (80+ years old) mixed mesophytic and cove forests. Projected optimum habitat for cerulean warbler for the next 100-years follows a similar pattern under all alternatives, with minor differences in the amount in certain decades. In the first decade, optimum cerulean warbler habitat is projected to drop from the current estimated 200,000 acres to around 175,000 to 180,000 acres under all alternatives. This small decline is due to projected timber harvesting in 80+ year-old mixed mesophytic stands. The decline is projected to be short-lived, however, followed by a large increase to about 290,000 to 300,000 acres in the second decade under all alternatives. This

increase is due to the large acreage of current mid-successional mixed mesophytic stands reaching 80+ years old in the second decade. Following this increase, a gradual decline is projected through the seventh decade for all alternatives as harvesting to achieve age class diversity removes some mid-late and late successional stands. The amount is projected to rise gradually under all alternatives in the eighth through tenth decades, with the differences among alternatives becoming smaller and all alternatives finishing between 250,000 and 270,000 acres. In every decade of the planning horizon, the amount of optimum habitat produced by each alternative exceeds at least 3.5 times the 50,000-acre cerulean warbler habitat objective set by Partners in Flight for the entire mid-Atlantic Ridge and Valley physiographic area (Partners in Flight 2003). Therefore, all alternatives should provide ample habitat for cerulean warblers.

Optimum habitat for wild turkey (MIS) – area of oak and pine-oak forest of optimum mast-producing age (50-150 years old), plus openings, within MPs 2.0, 3.0, 6.1, and 6.3. Due to aging and harvesting of oak and pine-oak stands that currently are in the optimum mast-producing range, optimum turkey habitat will decline throughout the planning horizon under all alternatives. Because this indicator considers only those optimum mast-producing stands and openings that are in MPs 2.0, 3.0, and 6.1, the decline will be most pronounced under Alternative 3, which allocates large areas that currently are MP 6.1 to MPs 5.1 and 6.2. Through the fifth decade of the planning horizon, the decline would be gradual, as timber harvesting to achieve age class diversity removes some 50- to 150-year-old oak and pine-oak stands. In the fifth decade, Alternative 1 would provide the most optimum turkey habitat, at about 215,000 acres, while Alternative 3 would provide the least, at about 125,000 acres. Alternatives 2, 2M, and 4 would each produce about 185,000 acres. The projected decline becomes much steeper in the sixth and seventh decades as many stands that are currently in the optimum mast-producing range age beyond 150 years. The projected decline levels off in the eighth through tenth decades as stands harvested in the early decades reach the optimum mast-producing range. Because Alternative 4 has the highest harvest levels in the early decades, it has the highest amount of projected optimum turkey habitat in the eighth through tenth decades. In the tenth decade, Alternative 4 would provide a little more than 110,000 acres. Alternative 3 still is projected to have the lowest amount of optimum turkey habitat; it would provide a little over 60,000 acres in the tenth decade. Alternatives 1 and 2 would provide 85,000 to 90,000 acres. Most of the future decline in optimum turkey habitat is due to the current concentrated age class distribution of the Forest. The current concentration of nearly all oak and pine-oak stands in the optimum mast-producing age range is not sustainable over the long term under any possible management scenario. Because of the inevitable decline in optimum habitat, the Forest's carrying capacity for turkeys is expected to decline under all alternatives, particularly in the later decades of the planning horizon. The decline would be more pronounced under Alternative 3 than the other alternatives, especially during the first half of the planning horizon.

Optimum habitat for West Virginia northern flying squirrel (MIS) (area of mid-late and late successional spruce forest) and Potential Active Spruce Restoration Areas (roughly the area of mid-late and late successional northern hardwoods in MP 4.1, outside of current suitable flying squirrel habitat). Optimum habitat for West Virginia northern flying squirrel is projected to increase substantially under all alternatives. By the second decade of the planning horizon, optimum habitat would increase from the current 23,000 acres to about 42,000 acres, regardless of alternative. After 20 years the great majority of it will have reached the optimum

mid-late and late successional stages. After the first two decades, a continued gradual increase is projected, with the amount reaching about 48,000 acres under all alternatives in the eighth through tenth decades. Potential active spruce restoration areas are projected to increase gradually under the action alternatives in the early decades of the planning horizon. Alternative 1, which does not include MP 4.1, does not provide any potential active spruce restoration areas as measured by this indicator. Although patterns are the same, the amounts differ among the action alternatives. Alternative 4 would provide the most potential active spruce restoration area, with the amount leveling off at about 34,000 acres in the fifth through tenth decades. Alternative 3 would provide the least, with a little less than 10,000 acres in the fifth through tenth decades. Alternatives 2 and 2M would provide about 23,000 acres in the fifth through tenth decades.

Edge habitats providing abundant browse for white-tailed deer – all early successional forest (0-19 years old) plus openings. Edge habitats providing abundant browse for white-tailed deer are projected to increase sharply in the first and second decades of the planning horizon as harvesting to achieve age class diversity begins. The increase would be greatest under Alternative 4, with the amount reaching nearly 120,000 acres by the second decade. The increase would be smallest under Alternative 3, with the second-decade amount reaching about 83,000 acres. Amounts under Alternatives 1, 2, and 2M would reach around 100,000 acres in the second decade. In the third decade, the amount under Alternative 4 would decline somewhat and the amounts under Alternatives 1, 2, 2M, and 4 would be similar. For the third through seventh decades, the amount under these alternatives would fluctuate between 100,000 and 110,000 acres. Under Alternative 3, this indicator would fluctuate between about 80,000 and 90,000 acres during the entire planning horizon.

Optimum habitat for black bear – 50 to 150-year-old oak and pine-oak forest in MPs with limited public motorized access (MPs 4.1, 5.0, 5.1, 6.1, 6.2, 6.3, and remote backcountry portions of the NRA). Due to aging and harvesting of oak and pine-oak stands that currently are in the optimum mast-producing age range, optimum habitat for black bear would decline throughout the planning horizon under all alternatives. For the first six decades, the decline would be gradual and would be due primarily to harvesting of stands that are in the optimum mast-producing age range. During this time, Alternative 4 would produce the least optimum bear habitat, primarily because of lower land allocations to remote MPs, but also because of higher harvesting levels. The differences among alternatives would be greatest in the fifth decade, when Alternative 4 would provide just over 140,000 acres of optimum bear habitat, while Alternatives 1 and 3 would provide over 180,000 acres. In the seventh decade, optimum bear habitat would decrease substantially regardless of alternative, with all alternatives producing 70,000 to 75,000 acres. This large decrease is due to aging of oak and pine-oak forest beyond the optimum mast-producing age range. In the remaining decades of the planning horizon, Alternative 4 would provide somewhat more optimum bear habitat than the other alternatives. This is because the higher level of harvesting early in the planning horizon under Alternative 4 would produce more acreage to mature into the optimum mast-producing age range during the later decades of the planning horizon.

Threatened and Endangered Species

Running buffalo clover (RBC): potential effects to young and old successional stages of mixed mesophytic forest. Table S-17 displays the approximate acres of potential habitat by management prescription at the start of the planning period all alternatives. Since potential habitat is based on successional stages, over time some areas will move into or out of potential habitat due to either management actions or no action.

Table S-17. Acres of Potential RBC Habitat by Management Prescription by Alternative

Management Prescriptions	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
MP 5.0, 5.1, 6.2 – Little or no vegetation management	2,600	3,000	3,000	8,000	2,700
MP 4.1, 6.3, 7.0, 8.0 – Low levels of vegetation management	9,700	8,600	8,600	6,900	8,800
MP 2.0, 3.0, 4.0, 6.1 – Active vegetation management	19,900	22,800	22,800	19,400	22,900

Timber harvest activities, road construction and reconstruction, and road decommissioning (when it requires earth-moving activities) all have potential to effect RBC. Alternatives 2, 2M, and 4 have the greatest chance of impacting RBC and its habitat directly through disturbance. However, considering RBC needs a low level of disturbance to compete with other species, the effects of active management may be positive as well.

Shale barren rock cress (SBRC): potential effects to shale barrens by alternative. Potential habitat for SBRC is defined as shale barren areas with surface rock. Potential and known habitat on the Forest is estimated to be less than 100 acres. Known sites are protected by either assignment to an 8.0 management prescription or as protected inclusions in other prescriptions. Populations are monitored, and management of the habitat is coordinated with the WVDNR Heritage Program staff. Therefore, there would likely be no measurable direct or indirect effects to SBRC as a result of implementing any of the alternatives.

Small whorled pogonia (SWP): potential effects to hemlock forest and old plus mature mixed mesophytic forest. Potential habitat for SWP is defined as old and mature mixed mesophytic hardwood forests, old and mature oak, and old and mature pine-oak forests. Table S-18 shows the acres of this potential habitat by MP for all alternatives at the start of the planning period. Since potential habitat is based on successional stages, over time some areas will move into or out of potential habitat due to management action or no action.

Table S-18. Acres of Potential SWP Habitat all Alternatives and All Management Prescriptions

Community Type	Current Acres
Mixed mesophytic hardwoods(old and mature)	329,100
Oak (old and mature)	229,600
Pine-oak (old and mature)	44,500
Total	**603,200**

Under all alternatives, the majority of the area considered potential habitat is found in areas with MPs allowing active forest management. In these areas, direct and indirect effects to SWP would be avoided through surveys made before action is taken. Since this species is so rare and is known to remain dormant in some years, it could be missed in surveys of areas proposed for active management. The largest potential for this to occur is in MP 3.0 or 6.1 areas. Direct effects possible if the plant is missed include destruction of habitat or loss of individuals. The potential is slightly lower in Alternative 3 than in Alternatives 1, 2, 2M, or 4.

Virginia spiraea: potential effects to the banks of low-elevation large streams by alternative. This habitat is estimated to be only about 18,000 acres across the Forest, and Virginia spiraea is restricted to riparian areas. Riparian area protection for Forest-wide shade strips for Alternative 1, and for revised Forest-wide Soil and Water direction for Alternatives 2-4, would be applied site-specifically at the project level, and would greatly reduce the potential for impacts to Virginia spiraea along streams and rivers. As with other T&E species, surveys would be made before management occurs. Timber harvest does not generally occur in the riparian areas of larger streams and rivers. Therefore, there would likely be no measurable direct or indirect effects to Virginia spiraea as a result of implementing any of the alternatives.

Virginia big-eared Bat (VBEB): potential effects to foraging area by alternative. All alternatives would adequately protect VBEB populations and habitat through the application of management direction found in the 1986 Plan as amended or the 2006 Forest Plan, and through the consultation process with USFWS that would occur for any Forest project that has the potential to affect this species or its habitat. Thus, the analysis presented below represents the relative capability of the alternatives to potentially enhance or maintain current foraging habitat for VBEB through prescribed fire. Prescribed fire within VBEB foraging circles could have beneficial effects on foraging habitat by encouraging an herbaceous understory. Potential prescribed fire acres would differ by alternative as seen in Table S-19.

Table S-19. Projected Acres of Prescribed Fire in Virginia Big-Eared Bat Foraging Habitat During the First Decade of the Planning Horizon

Indicator	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Total VBEB Foraging Circle Acres on NFS Land	324,000	324,000	324,000	324,000	324,000
FRCC I, 3 and FRCC III, 2 Acres in MPs 3.0, 6.1, 6.3, 8.1, in VBEB Circles	62,000	69,000	67,000	63,000	69,000
Maximum Projected Acres of Prescribed Fire Treatment in VBEB Circles During the First Decade	1,000	10,000	10,000	1,500	24,000

Alternatives 1 and 3 would have little potential to improve VBEB foraging habitat using fire, whereas Alternative 4 would increase prescribed fire in VBEB habitat to more than 20 times the currently allowed level. Alternatives 2 and 2M would increase prescribed fire in VBEB habitat substantially beyond current levels, but would still be far below the levels of Alternative 4.

Indiana bat: potential effects to hibernacula, key area, maternity site, and primary range by alternative. It is expected that all of the alternatives would adequately protect Indiana bat populations and habitat through the application of management direction found in the 1986 Plan

as amended or the revised Forest Plan, and through the consultation process with USFWS that would occur for any Forest project that has the potential to affect this species or its habitat. The analysis presented below represents the relative capability of the alternatives to potentially maintain current habitat through no action, or to enhance habitat through management.

Within Indiana bat primary range, prescribed fire could be used to create and maintain semi-open stand structure that is favorable for roosting and foraging. Estimates of potential improvement to Indiana bat habitat within 5 miles of hibernacula through prescribed fire are based on Forest-wide goals and objectives in the 2006 Forest Plan (see Table S-20).

Table S-20. Projected Acres of Prescribed Fire in Indiana Bat Primary Range During the First Decade of the Planning Horizon

Indicator	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Total Acres of Indiana Bat Primary Range on NFS Land	228,000	228,000	228,000	228,000	228,000
FRCC I, 3 and FRCC III, 2 Acres in MPs 3.0, 6.1, 6.3, 8.1, in Primary Range	48,000	50,000	50,000	43,000	51,000
Maximum Projected Acres of Prescribed Fire Treatment in Primary Range During the First Decade	800	7,600	7,600	1,000	18,000

Alternatives 1 and 3 would have little potential to improve primary range using prescribed fire, whereas Alternative 4 would increase prescribed fire in primary range to more than 20 times the currently allowed level. Alternatives 2 and 2M would increase prescribed fire in primary range substantially beyond current levels, but would still be far below the levels of Alternative 4. Although specific objectives for prescribed fire have not been formulated beyond the first decade of the planning horizon, similar amounts of prescribed fire are expected in subsequent decades.

The expected amount of harvesting for habitat enhancement in primary range was estimated based on Plan objectives for the first decade of the planning horizon (see Table S-21).

Table S-21. Projected Acres of Silvicultural Habitat Enhancement in Indiana Bat Primary Range During the First Decade by Alternative

Indicator	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Total Acres of Indiana Bat Primary Range on NFS Land	228,000	228,000	228,000	228,000	228,000
Acres of Primary Range Where Silvicultural Habitat Enhancement would be Allowed	89,000	86,000	85,000	67,000	94,000
Maximum Projected Acres of Silvicultural Habitat Enhancement in Primary Range	7,300	7,100	7,000	5,500	7,700

Only Alternative 2M has an explicit objective for Indiana bat habitat enhancement; however, similar habitat enhancement would be desirable under all alternatives. Habitat enhancement for the other alternatives was estimated by proportionally extrapolating the Alternative 2M objective to the areas of primary range that would be available for enhancement based on MP allocations and tentative timber suitability. During the first decade of the planning horizon, Alternatives 1,

2, 2M, and 4 would have similar amounts of habitat enhancement in primary range. The amount would be lower in Alternative 3 because of larger land allocations to MPs where silvicultural habitat treatments would be unlikely.

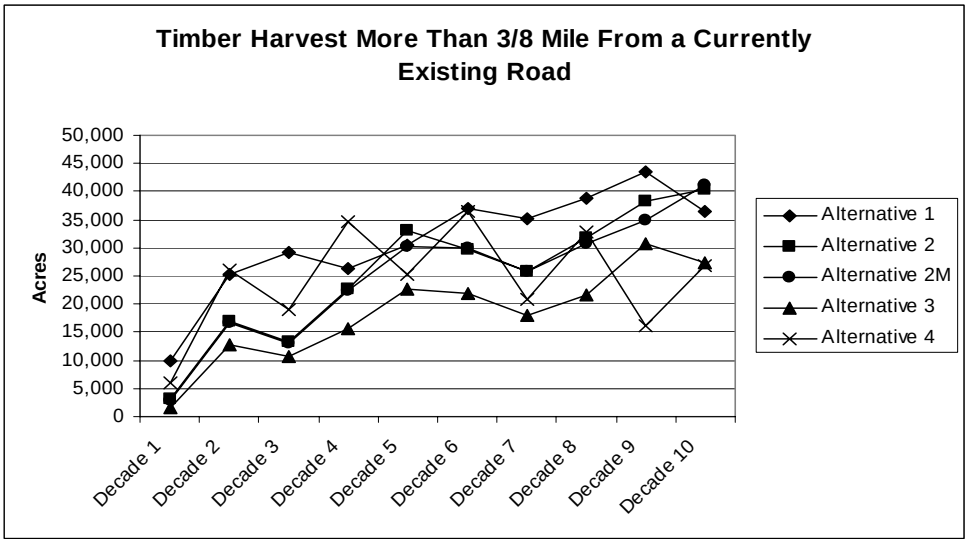
West Virginia northern flying squirrel (WVNFS): potential effects to suitable habitat by alternative. It is expected that all of the alternatives would adequately protect WVNFS populations and habitat through the assignment of management prescriptions and the application of management direction found in the 1986 Plan as amended or the 2006 Plan, and through the consultation process with USFWS that would occur for any Forest project that has the potential to affect this species or its habitat. See also the effects summary for this species under Management Indicator Species.

Cheat Mountain salamander: potential effects to Cheat Mountain salamander habitat by alternative. It is expected that all of the alternatives would adequately protect Cheat Mountain salamander populations and habitat through the application of management direction found in the 1986 Plan as amended or the 2006 Plan, and through the consultation process with USFWS that would occur for any Forest project that has the potential to affect this species or its habitat.

Bald eagle: potential effects to nesting habitat in riparian areas by alternative. Bald eagles may be found mainly along lakes or lower-elevation reaches of large rivers. Riparian area protection measures identified under the 1986 Plan for Alternative 1, and under 2006 Plan Forest-wide direction for Alternatives 2-4, would be applied site-specifically at the project level, and would greatly reduce the potential for impacts to bald eagles and their habitats along streams and rivers. Therefore, there would likely be no measurable effects to bald eagles as a result of implementing any of the alternatives.

Non-native Invasive Species

Figure S-3.

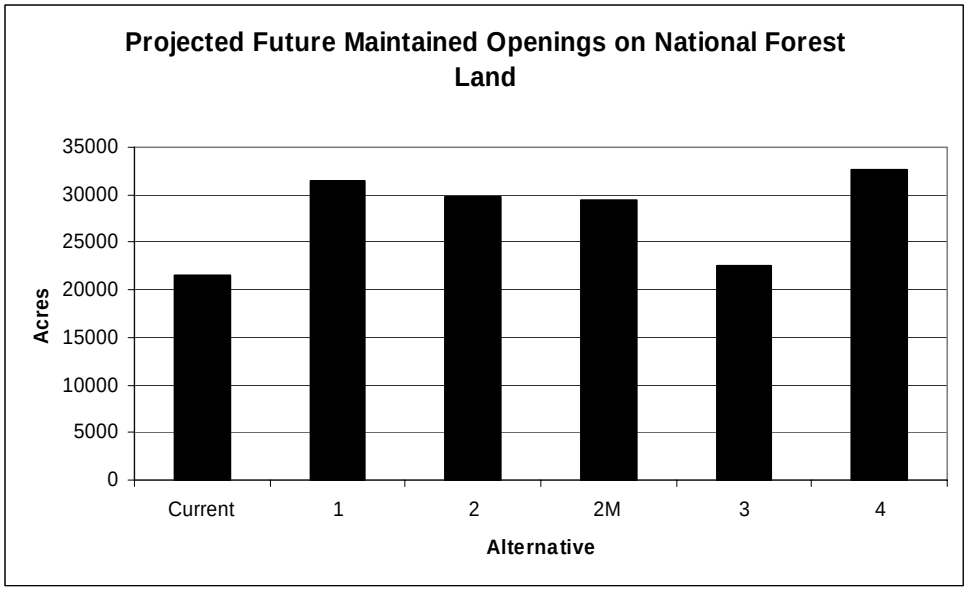


Amount of timber harvest 3/8 of a mile or more from existing roads by alternative – Roads and road traffic are a known vector for NNIS establishment and spread. Generally, harvest units that are over 3/8 of a mile require construction of new system or temporary roads. Acreage of timber harvest 3/8 of a mile or more from the nearest road was projected by Spectrum modeling and is shown in Figure S-3.

Alternative 1 has the highest amount of projected timber harvest more than 3/8 of a mile from an existing road in most decades, peaking at about 44,000 acres in the ninth decade. Alternative 3 has the lowest amount in most decades, with a peak of about 31,000 acres in the ninth decade. Under Alternatives 2 and 2M, the amount reaches its highest point of about 40,000 acres in the tenth decade, whereas Alternative 4 peaks at about 37,000 acres in the sixth decade. When the indicator is summed across the 10-decade planning horizon, Alternative 1 has a little more than 310,000 acres harvested beyond 3/8 of a mile from a currently existing road, which is the most of any alternative. Alternative 3 has the least, estimated at just over 180,000 acres. Alternatives 2, 2M, and 4 are intermediate at around 250,000 acres. According to this indicator, Alternative 1 would have the highest risk of facilitating the invasion and spread of NNIS plants, Alternatives 2, 2M, and 4 would have intermediate risk, and Alternative 3 would have the lowest risk.

Amount of maintained openings by alternative - The projected future amount of maintained openings differs across alternatives approximately in proportion to allocation of land to the suitable base MPs that have goals for creating and maintaining openings (Figure S-4). Alternatives 1, 2, 2M, and 4 all have 30,000 to 33,000 acres of maintained openings, whereas Alternative 3 has about 23,000 acres. The projected future amounts under Alternatives 1, 2, 2M, and 4 all represent a noticeable increase from the current estimate of 22,000 acres. Based on this indicator, Alternatives 1, 2, 2M, and 4 would have a higher risk of facilitating invasion and spread of NNIS plants than Alternative 3.

Figure S-4.



Vegetation Management

Indicators and Effects for Issue #1

Age Class Distribution by Alternative - Tables S-21 through S-25 show the age class distributions (in percent) predicted as a result of vegetation management in MPs 3.0 and 6.1 by alternative at the end of the first, fifth, and tenth decades of management.

Alternative 1 – MPs 2.0, 3.0, 4.0, and 6.1 contain an estimated 332,200 acres of MNF lands that can be actively managed for timber in this alternative. On the remaining 585,200 acres, only natural disturbance events would contribute to creating early successional habitat. One major constraint that restricts regeneration harvests on suitable timber lands is the 200-year rotation cycle for most forest types. This averages to ½ percent per year of regeneration harvest to attain a balanced age class distribution on those acres that can be actively managed. On 332,200 acres it would be necessary to annually regenerate an average of 1,661 acres to balance age classes over the 200-year rotation cycle. If this alternative were to achieve desired conditions in the revised Forest Plan in a 10-decade time frame, it is estimated that annually 4,200 acres have to be regenerated into early successional stands, or about 0.5 percent of the total MNF acres.

Table S-21. Age Class Distribution Percentages in MPs 3.0 and 6.1 for Alternative 1

Time Frame	Percent of Age Class or Successional Stage – MP 3.0				
	Early (0-19 years)	Early to Mid (20-39 years)	Mid (40-79 years)	Mid to Late (80-119 years)	Late (≥120 years)
Current Distribution	4.6	4.8	31.1	54.1	5.4
End of 1st Decade	5.9	4.8	31.1	52.7	5.5
End of 5th Decade	15.4	17.1	10.7	19.2	37.6
End of 10th Decade	9.4	12.7	19.4	17.9	40.6
Time Frame	**Percent of Age Class or Successional Stage – MP 6.1**				
	Early (0-19 years)	**Early to Mid (20-39 years)**	**Mid (40-79 years)**	**Mid to Late (80-119 years)**	**Late (≥120 years)**
Current Distribution	3.8	4.8	32.2	54.6	4.6
End of 1st Decade	9.6	4.8	32.2	48.8	4.6
End of 5th Decade	14.7	12.8	14.4	21.0	37.1
End of 10th Decade	14.9	13.2	18.7	16.1	37.1

Alternative 2 – An estimated 330,300 acres are available for active management in this alternative. Annually, an estimated maximum of 3,400 acres would be regenerated into early successional stands, or about 0.4 percent of the total MNF acres. Another way of interpreting this is, on an annual basis an estimated 99.6 percent of the MNF acres would continue to move toward older age classes. An estimated 587,100 acres are not suitable for timber management in this alternative, and only natural events would contribute to creating early successional habitat in these areas.

Table S-22. Age Class Distribution Percentages in MPs 3.0 and 6.1 for Alternative 2

Time Frame	Percent of Age Class or Successional Stage – MP 3.0				
	Early (0-19 years)	Early to Mid (20-39 years)	Mid (40-79 years)	Mid to Late (80-119 years)	Late (≥120 years)
Current Distribution	4.2	4.5	33.0	54.5	3.8
End of 1st Decade	13.2	4.6	33.0	45.4	3.8
End of 5th Decade	20.0	19.0	17.8	17.9	25.3
End of 10th Decade	15.9	18.2	23.4	21.9	20.6
Time Frame	**Percent of Age Class or Successional Stage – MP 6.1**				
	Early (0-19 years)	**Early to Mid (20-39 years)**	**Mid (40-79 years)**	**Mid to Late (80-119 years)**	**Late (≥120 years)**
Current Distribution	3.7	4.8	23.9	61.6	6.0
End of 1st Decade	8.3	4.8	21.7	59.4	5.8
End of 5th Decade	10.2	8.1	13.1	18.4	50.2
End of 10th Decade	11.2	10.5	15.3	13.3	49.7

Alternative 2M – An estimated 329,400 acres are available for active management in this alternative. Annually, an estimated maximum of 3,400 acres would be regenerated into early successional stands, or about 0.4 percent of the total MNF acres. Another way of interpreting this is, on an annual basis approximately 99.4 percent of the MNF acres would continue to move toward older age classes. An estimated 588,000 acres are not suitable for timber management in this alternative, and only natural events would contribute to creating early successional habitat in these areas.

Table S-23. Age Class Distribution Percentages in MPs 3.0 and 6.1 for Alternative 2M

Time Frame	Percent of Age Class or Successional Stage – MP 3.0				
	Early (0-19 years)	Early to Mid (20-39 years)	Mid (40-79 years)	Mid to Late (80-119 years)	Late (≥120 years)
Current Distribution	4.2	4.4	33.0	54.6	3.8
End of 1st Decade	13.1	4.5	33.0	45.6	3.8
End of 5th Decade	20.0	19.1	17.6	17.8	25.6
End of 10th Decade	15.8	18.0	23.7	22.0	20.6
Time Frame	**Percent of Age Class or Successional Stage – MP 6.1**				
	Early (0-19 years)	**Early to Mid (20-39 years)**	**Mid (40-79 years)**	**Mid to Late (80-119 years)**	**Late (≥120 years)**
Current Distribution	3.8	5.0	23.7	61.4	6.1
End of 1st Decade	8.5	5.0	21.7	58.8	6.0
End of 5th Decade	10.2	7.9	13.5	18.3	50.1
End of 10th Decade	11.4	10.9	15.3	13.4	49.0

Alternative 3 – An estimated 253,400 acres are available for timber harvest in this alternative. Annually, an estimated maximum of 2,400 acres would be regenerated into early successional stands, or about 0.3 percent of the total MNF acres. In this alternative about 99.7 percent of MNF acres, on an annual basis, would continue to move toward older age classes, with about 664,000 acres that would not be suitable for timber management.

Table S-24. Age Class Distribution Percentages in MPs 3.0 and 6.1 for Alternative 3

Time Frame	Percent of Age Class or Successional Stage – MP 3.0				
	Early (0-19 years)	Early to Mid (20-39 years)	Mid (40-79 years)	Mid to Late (80-119 years)	Late (≥120 years)
Current Distribution	4.3	4.5	32.5	54.7	4.0
End of 1st Decade	13.0	4.5	32.5	46.0	4.0
End of 5th Decade	20.0	17.9	17.5	17.8	26.8
End of 10th Decade	14.5	18.5	24.6	22.2	20.2
Time Frame	**Percent of Age Class or Successional Stage – MP 6.1**				
	Early (0-19 years)	**Early to Mid (20-39 years)**	**Mid (40-79 years)**	**Mid to Late (80-119 years)**	**Late (≥120 years)**
Current Distribution	4.1	4.8	25.6	59.6	5.9
End of 1st Decade	5.8	4.8	25.6	57.9	5.9
End of 5th Decade	9.2	9.1	10.6	20.4	50.7
End of 10th Decade	10.0	9.7	14.2	12.7	53.4

Alternative 4 - This alternative has about 346,700 acres available for timber harvest. Annually, an estimated maximum of 5,200 acres would be regenerated into early successional stands, or about 0.6 percent of the total MNF acres. About 570,700 acres are not suitable for timber harvest in this alternative.

Table S-25. Age Class Distribution Percentages in MPs 3.0 and 6.1 for Alternative 4

Time Frame	Percent of Age Class or Successional Stage – MP 3.0				
	Early (0-19 years)	Early to Mid (20-39 years)	Mid (40-79 years)	Mid to Late (80-119 years)	Late (≥120 years)
Current Distribution	4.1	4.4	34.3	53.5	3.7
End of 1st Decade	13.9	4.4	34.3	43.7	3.7
End of 5th Decade	19.8	19.5	16.4	13.3	31.0
End of 10th Decade	11.8	15.7	26.5	23.5	22.5
Time Frame	**Percent of Age Class or Successional Stage – MP 6.1**				
	Early (0-19 years)	**Early to Mid (20-39 years)**	**Mid (40-79 years)**	**Mid to Late (80-119 years)**	**Late (≥120 years)**
Current Distribution	3.6	4.6	24.1	61.7	6.0
End of 1st Decade	12.3	4.6	22.1	56.0	5.0
End of 5th Decade	10.6	7.4	17.0	15.7	49.3
End of 10th Decade	9.8	10.1	18.0	15.1	47.0

Indicators and Effects for Issue #2

Acres of potential change in restoration of spruce and oak and communities by alternative

Spruce Restoration - Most of the spruce restoration assigned to MP 4.1 is designed for passive management. For most of MP 4.1 and for MPs that do not allow active management, the forest

communities will continue to age naturally. The total amount of potential spruce restoration (both passive and active) that could occur is shown in Table S-26 by alternative.

Table S-26. Total Acres of Potential Spruce Restoration Areas

Alternative 1	Alternative 2	Alternative 2M	Alternative 3	Alternative 4
130,000	140,000	140,000	140,000	140,000

There is little difference in overall potential spruce restoration under any alternative, and no difference among the action alternatives that could be implemented. However, the amount of acres available for active spruce restoration does vary somewhat by alternative. These differences are shown in Table S-27 as the acres of northern hardwood stands in MP 4.1, but not in WVNFS suitable habitat, that would be at least 80 years old at the end of the fifth decade. All potential 4.1 acres and potential suitable 4.1 acres are both shown because restoration could occur outside of suitable timberlands.

Table S-27. Acres Available for Active Spruce Restoration 50 Years From Today

Acres Available for Restoration	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
All Potential Acres in MP 4.1	0	23,000	24,000	9,000	34,000
Potential Suitable Acres in MP 4.1	0	9,700	10,000	6,200	16,800

Although Table S-27 is only intended as a relative comparison of areas that could provide active spruce restoration opportunities by alternative, the table shows that the most opportunities could occur under Alternative 4, followed in descending order by Alternatives 2M, 2, 3, and 1.

Oak Restoration - Unlike spruce restoration, oak restoration would focus on active vegetation management tools such as even-aged timber harvest and prescribed fire. Although some harvest-related oak restoration could also occur in MPs 3.0 and 8.1, most of the direction and opportunities for oak restoration are associated with MP 6.1. This MP area not only includes a majority of the declining oak communities on the Forest, but it also has suitable timberlands with a wildlife habitat management emphasis. Suitable timber acres of mixed oak and pine-oak forest types in MP 6.1 are shown in Table S-28 by alternative. These acres represent the most likely area where oak restoration would occur using commercial timber harvest as a tool. Table S-28 shows that Alternative 4 would have the most acres, followed in descending order by Alternatives 2, 1, and 3. Alternative 4 would have nearly double the acres of Alternative 3.

Table S-28. Acres of Oak Forest Types Within MP 6.1 by Alternative

Oak Types within MP 6.1	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Acres of mixed oak in MP 6.1	66,300	97,500	97,300	55,700	106,000
Acres of pine-oak in MP 6.1	18,600	28,500	28,500	12,200	31,200
Total Acres	84,900	126,000	125,800	67,900	137,200

For all alternatives, additional oak forests would be available for treatment outside of the suitable acres displayed in Table S-28. These areas could be treated with a mixture of timber harvest and prescribed fire to achieve oak regeneration; however, funding would likely have to come from different sources than the Timber program. The most total oak forests available would be in Alternative 4 (213,700 acres), followed by Alternative 2 (191,900 acres), Alternative 2M (188,500 acres), Alternative 1 (136,800 acres), and Alternative 3 (110,400 acres).

Acres of Fire Regime I Condition Class 3 and Fire Regime III Condition Class 2 in MPs 3.0, 6.1, and 8.1 by alternative - Over the short and long term, fire management would focus on those areas considered most at risk due to their departure from their natural fire regimes. On the MNF these areas have been identified and mapped as Fire Regime I, Condition Class 3, and Fire Regime III, Condition Class 2. Table S-29 shows the acres of these FRCC that occur in MPs 3.0, 6.1, and 8.1 by alternative. This combination of MPs and FRCCs represent the most likely areas where oak restoration would occur using prescribed fire as a tool. Table S-29 shows Alternative 4 with the most acres, followed in descending order by Alternatives 2, 2M, 1, and 3.

Table S-29. Acres of FRCC 3 and 2 in MPs 3.0, 6.1, and 8.1 by Alternative (mixed oak and pine-oak forest types only)

Alternative	Management Prescription	Acres by Fire Regime (FR) and Condition Class (CC)		MP Subtotal Acres	Total Acres for All MPs
		FR I, CC 3	FR III, CC 2		
Alt. 1	MP 3.0	13,800	32,200	46,000	**183,200**
	MP 6.1	78,000	59,200	137,200	
Alt. 2	MP 3.0	3,000	16,400	19,400	**198,200**
	MP 6.1	75,100	79,000	154,100	
	MP 8.1	21,100	3,600	24,700	
Alt. 2M	MP 3.0	3,000	16,400	19,400	**195,700**
	MP 6.1	73,200	78,400	151,600	
	MP 8.1	21,100	3,600	24,700	
Alt. 3	MP 3.0	3,000	15,800	18,800	**129,900**
	MP 6.1	31,200	55,200	86,400	
	MP 8.1	21,100	3,600	24,700	
Alt. 4	MP 3.0	3,000	16,400	19,400	**217,300**
	MP 6.1	86,000	87,200	173,200	
	MP 8.1	21,100	3,600	24,700	

Overall, the best opportunities for oak restoration using a combination of timber harvest and prescribed fire tools would be in Alternative 4, followed in descending order by Alternatives 2, 2M, 1, and 3.

Timber Supply

Acres of land suited and not suited for timber management by alternative - In Alternative 1, the forested acres considered suited for timber management are located in MPs 2.0, 3.0, 4.0, and 6.1. In Alternatives 2 through 4 these MPs shift to 3.0, 4.1, and 6.1. Most of the lands in MP 4.1 that are suitable habitat for the endangered West Virginia northern flying squirrel (WVNFS) are not suitable for timber management and will not be actively managed except for research or administrative study purposes. Those lands in MP 4.1 that are not in WVNFS suitable habitat but have a spruce component, may be actively managed for restoration of the spruce-hardwood community, but are not considered as suitable for timber management. Only those stands that do not have a spruce component in MP 4.1 are considered to be suitable for timber management. Table S-30 breaks out the tentatively suitable acres into categories that are considered not suited for timber management by MP. Many of the constraint categories were combined to show collective acres in order to avoid double-counting acres where two or more of the areas overlap.

Table S-30. Lands Suited and Available for Commercial Timber Harvest

Land Class Description	Acres				
	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Total modeled acres	912,516	912,516	912,516	912,516	912,516
Wilderness (MP 5.0)	-78,738	-78,738	-78,738	-78,738	-78,738
Recommended Wilderness (MP 5.1)	-0	-27,657	-27,657	-99,148	-0
Backcountry Recreation (MP 6.2)	-124,125	-95,993	-105,223	-222,854	-49,716
Special Areas (MP 8.0)	-115,979	-69,920	-72,820	-57,746	-69,920
Indiana Bat Primary Range in MPs 3.0, 4.1, 6.1	-0	-148,061	-146,064	-92,971	-164,521
Tentatively unsuitable	-261,464	-161,852	-152,629	-107,693	-202,875
WV Northern Flying Squirrel Suitable Habitat*					
Eligible Wild or Scenic WSR Corridors**					
Indiana Bat Key Areas and Hibernacula***					
Very High and Distinct Scenic Integrity Areas					
Perennial & Intermittent Stream Channel Buffers					
Existing suitable base adjustment****					
Suited Timberland Available for Harvest	332,200	330,300	329,400	253,400	346,700
Percent of Forest Land Base	**36%**	**36%**	**36%**	**28%**	**38%**

*In Alternative 1, WV northern flying squirrel suitable habitat is in Opportunity Area 832, part of MP 8.0
**Includes all rivers in Alternative 1, but only Wild or Scenic classification rivers in Alternatives 2, 3 and 4
***Calculated for Alternative 1, but incorporated into Indiana bat primary range for Alternatives 2, 3, and 4
****Includes adjustments in Alternative 1 for land acquisition and exchanges, and removal of the "floating" timber base referred to in 1986 but never clearly identified on the ground

Potential cubic board feet of ASQ by alternative - Table S-31 displays the projected annual timber harvest volume for each alternative during the first, fifth, and tenth decades in order to show both short- and long-term effects. The volume projections are based on growth and yield estimates from the Spectrum computer model. These estimates have not been adjusted to consider projected budget or personnel needed to plan, analyze, and implement projects to achieve these potential outputs.

Table S-31. Projected Annual Volume of Timber Harvested by Decade in MCF (Thousand Cubic Feet) and MMBF (Million Board Feet)

Decade	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
First	108 MMCF 646 MMBF	105 MMCF 632 MMBF	105 MMCF 629 MMBF	83 MMCF 498 MMBF	133 MMCF 800 MMBF
Fifth	108 MMCF 646 MMBF	105 MMCF 632 MMBF	105 MMCF 629 MMBF	83 MMCF 498 MMBF	100 MMCF 601 MMBF
Tenth	108 MMCF 646 MMBF	105 MMCF 632 MMBF	105 MMCF 629 MMBF	83 MMCF 498 MMBF	113 MMCF 679 MMBF

Acres treated by harvest method by alternative - Table S-32 shows the amount of acres that the Spectrum model predicted would be treated by different harvest method by alternative, over the next decade, the fifth decade, and the tenth decade.

Table S-32. Projected Annual Acreage of Timber Harvest by Harvest Method by Decade

Acres in Decade 1: 2006-2015					
Harvest Method	**Alt. 1**	**Alt. 2**	**Alt. 2M**	**Alt. 3**	**Alt. 4**
Intermediate Harvests	27,411	11,324	11,335	20,382	0
Two-aged Harvests	18,092	16,396	17,239	8,602	23,800
Clearcuts with Reserve Trees	5,860	12,735	11,862	9,435	14,963
Shelterwood Harvests	3,458	4,841	4,902	2,345	12,810
Totals	54,821	45,296	45,338	40,764	51,573
Acres in Decade 5: 2046-2055					
Intermediate Harvests	639	1,032	848	560	2,614
Two-aged Harvests	15,788	16,633	16,663	12,749	15,337
Clearcuts with Reserve Trees	9,416	9,920	9,779	8,893	14,701
Shelterwood Harvests	31,778	24,507	24,232	16,777	10,929
Totals	57,621	52,092	51,522	38,977	43,581
Acres in Decade 10: 2096-2105					
Intermediate Harvests	19,615	9,460	12,480	8,706	8,758
Two-aged Harvests	14,917	16,008	15,640	12,622	18,056
Clearcuts with Reserve Trees	10,592	13,181	12,567	9,626	15,894
Shelterwood Harvests	14,876	13,375	13,348	9,288	9,053
Totals	60,000	52,025	54,035	40,184	51,761

Mineral Resources

Percent of federally owned natural gas acres available for exploration and development by alternative - Table S-33 shows that Forest Plan standards that prohibit surface occupancy within federal oil and gas leases result in different acreages by alternative of federally owned natural gas unavailable for exploration, development or production. Prohibition standards are found in MPs 5.0, 5.1, 6.2, most 8.0 areas, and municipal watersheds. These are acres that are unavailable

because they cannot be reached by directionally drilling from federally owned gas outside of the boundary of the area in which surface occupancy is prohibited.

Table S-33. Acres and Percent of Federally Owned Gas within MNF Unavailable for Gas Leasing and Development by Alternative

Affected Area	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
	Acres	Acres	Acres	Acres	Acres
MP 5.0	76,000	76,000	76,000	76,000	76,000
MP 5.1, 6.2, or SPNM portions of 8.1	66,000	57,000	71,000	127,000	38,000
MP 8 (excluding MP 8.1)	1,000	1,000	1,000	1,000	1,000
Municipal watersheds	3,000	0	0	0	0
Total acres affected	**146,000**	**134,000**	**148,000**	**204,000**	**115,000**
Percent of federally owned gas affected	**25%**	**23%**	**26%**	**36%**	**20%**

Potential natural gas resources available for production from the MNF by alternative - Table S-34 shows how the amount of federally owned gas available for exploration and development affects the potential natural gas production from the federal oil and gas estate within the Forest. Under Alternatives 1 and 2M, there is a 19 percent chance for discovery and production of 195 Bcf of natural gas. Alternative 2 has an estimated 199 Bcf due to an additional 12,000 more acres available for exploration in Alternative 2. Under Alternative 3, the acres unavailable (204,000) have resulted in less gas production potential of 30 Bcf than Alternative 1. Under Alternative 3, 73 percent of the total federal gas potential could be produced. Under Alternative 4, which has 31,000 acres more than Alternative 1 available, the most—209 Bcf or 92 percent of the total federal gas potential—gas production could occur as compared to the other alternatives.

Table S-34. Potential Natural Gas Production from the MNF by Alternative
(in Billion Cubic Feet)

Gas Production Potential	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Potential (19 percent chance) for Production from federally owned oil and gas within the MNF (in billion cubic feet)	195	199	195	165	209
Percent of total potential federal gas production if only wilderness were unavailable	86%	88%	86%	73%	92%

Recreation and Wilderness

Acres of backcountry recreation areas by alternative – The total backcountry recreation opportunities on the Forest are calculated by adding up the amount of land allocated to MPs 5.0 (Designated Wilderness), 5.1 (Recommended Wilderness), 6.2 (Backcountry Recreation) MPs, and the potential 6.2 areas that would be managed for a SPNM setting within the Spruce Knob-Seneca Rocks NRA. Lands emphasizing backcountry recreation vary by alternative as seen in Table S-35. Alternative 3 would have the most total area, primarily because it has nearly twice the amount of MP 6.2 area than Alternative 1, the current condition. Alternative 2 would provide backcountry recreation opportunities in about 3 percent more (25,600 acres) of the entire Forest than Alternative 1, Alternative 2M would provide backcountry recreation opportunities in about 4 percent more (34,900 acres) of the entire Forest than Alternative 1. Alternative 4 would have 5 percent less of the Forest in backcountry recreation emphasis than Alternative 1.

Table S-35. Total Backcountry Recreation Opportunity Acres by Alternative

Recreation Opportunity Area	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Designated Wilderness (5.0)	78,700	78,700	78,700	78,700	78,700
Recommended Wilderness (5.1)	0	27,700	27,700	99,400	0
Backcountry Recreation (6.2)	124,500	97,500	106,800	225,900	51,000
SPNM Acres within NRA (8.1)	0	24,900	24,900	13,000	24,900
Total Acres	**203,200**	**228,800**	**238,100**	**417,000**	**154,600**
Percent of Forest	**22%**	**25%**	**26%**	**45%**	**17%**

Recreation Opportunity Spectrum (ROS) Class distribution by alternative – Recreation settings and opportunities on the Forest can be estimated by comparing the ROS class distributions that would be created by alternative. The existing condition percentages lean toward the RN and SPM Classes due primarily to the legacy of roads, most of which were created during the extensive logging period of 70-120 years ago. The desired conditions recognize that many roads will continue to disappear or be decommissioned over time. Thus, all alternatives would have more potential SPNM Class in the future. The amount, as seen in Table S-37, differs by alternative, reaching a high point of 54 percent of the Forest in Alternative 3, and a low point of 34 percent in Alternative 4.

Table S-37. ROS Class Distribution by Alternative in Percent of Forest

ROS Class	Existing Condition	Alt. 1 Desired Condition	Alt. 2 Desired Condition	Alt. 2M Desired Condition	Alt. 3 Desired Condition	Alt. 4 Desired Condition
Primitive	0	0	0	0	0	0
Semi-Primitive Non-Motorized	21%	40%	40%	41%	54%	34%
Semi-Primitive Motorized	35%	19%	18%	18%	13%	21%
Roaded Natural	44%	41%	42%	41%	33%	45%
Rural	<1%	<1%	<1%	<1%	<1%	<1%
Urban	0	0	0	0	0	0

Percent contribution to backcountry recreation opportunities in West Virginia by alternative - The alternatives would contribute anywhere from 92 percent (Alternative 4) to 97 percent (Alternative 3) of the backcountry recreation settings on public lands in West Virginia. Under any of the alternatives considered, the Monongahela NF would continue to be the primary provider of backcountry recreation settings and opportunities in the State of West Virginia.

Scenic Environment

Acres of even-aged harvest, intermediate thinning, and prescribed fire - Table S-38 compares activities by alternative that could affect visual quality on the Forest over the next two decades, using annual averages from the model. It should be noted that Scenic Integrity Objectives are designed to mitigate any long-term effects to the landscape's scenic integrity.

Alternative 3 would have the least amount of even-aged regeneration harvest over the next two decades, followed in ascending order by Alternatives 1, 2M, 2, and 4. Alternative 4 would have the least amount of intermediate treatments, followed in ascending order by Alternatives 2M, 2, 3, and 1. Alternatives 1 and 3 would have the least amount of fire use acres, followed by Alternatives 2 and 2M, and then Alternative 4. Overall, Alternative 3 would have the least amount of visual impacts based on the activity groups above, followed in ascending order by Alternatives 1, 2M, 2, and 4.

Table S-38. Maximum Potential Activities That May Affect Scenic Integrity by Alternative
(Estimated annual average of acres for the first two decades, based on Spectrum outputs)

Activity Group	Maximum Annual Activity Acres				
	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Acres of Regeneration Harvest	3,450	3,650	3,600	2,670	4,450
Acres of Intermediate Thinning	2,120	870	860	1,610	740
Acres of Prescribed Fire	300	3,000	3,000	300	7,500
Totals	**5,870**	**7,520**	**7,460**	**4,580**	**12,690**

Road Transportation System

Relative potential change in Forest Classified Roads by 2015 related to timber harvest by alternative - New road construction over the planning period is most likely to be associated with timber harvest. Estimated acres of timber harvest by alternative are shown in Table S-39.

Table S-39. Acres of Projected Maximum Timber Harvest by Alternative in Decade 1

Estimated Maximum Harvest Acres for the Next Decade by Alternative				
Alternative 1	Alternative 2	Alternative 2M	Alternative 3	Alternative 4
54,821	45,297	45,338	40,764	51,573

Potential change in Forest Classified Roads related to harvest distance from roads by alternative - Comments received on the Draft EIS suggested that we provide more information on the potential for new road construction by looking at the relationship between acres harvested by alternative and how far those acres would be from existing roads. The premise behind this request is simple—the farther the harvested stands are from existing roads, the more road will be needed to access them.

Table S-40 shows maximum acres harvested and associated roads needed for the first decade of the planning horizon, while Table S-41 shows the same information for the fifth decade (40-50 years from now) of the planning horizon.

Table S-40. Miles of Road by Alternative for Decade 1 Based on Maximum Harvest Levels and Harvest Distance From Roads

Indicator	Distance to Road (Miles)	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Maximum Acres Harvested	0 to 3/8	44,911	42,133	42,349	39,154	45,460
	3/8 to 6/8	7,328	3,060	2,989	1,057	5,316
	6/8 to 9/8	1,482	80	0	553	500
	> 9/8	1,100	24	0	0	288
	Totals	54,821	45,297	45,338	40,764	51,573
Harvest Using New and Existing Maintenance Level 3, 4, and 5 Roads, and Reconstructing Existing Maintenance Level 1 and 2 Roads	0 to 3/8	0.0	0.0	0.0	0.0	0.0
	3/8 to 6/8	15.4	6.4	6.4	2.3	11.3
	6/8 to 9/8	3.4	0.4	0.0	1.5	1.1
	> 9/8	2.6	0.4	0.0	0.0	0.8
	Totals	21.4	7.1	6.4	3.8	13.1
Harvest Using New Maintenance Level 3, 4, and 5 Roads, and Reconstructing Existing Maintenance Level 1 and 2 Roads	0 to 3/8	0.0	0.0	0.0	0.0	0.0
	3/8 to 6/8	15.4	6.4	6.4	2.3	11.3
	6/8 to 9/8	6.8	0.8	0.0	3.0	2.3
	> 9/8	7.9	1.1	0.0	0.0	2.3
	Totals	30.0	8.3	6.4	5.3	15.8
Estimated Range of Road Miles for the Decade		21 - 30	7 – 8	6 – 6	4 – 5	13 - 16

As shown in Table S-40, Alternative 1, which is harvesting the most timber over the decade, would also need the most roads to harvest that timber. Alternative 1 is followed in order by Alternatives 4, 2, 2M, and 3. That all alternatives have such a low overall need for new road is closely related to the high amount of harvest close to existing roads that has been projected.

By the fifth decade, represented in Table S-41, road mile patterns have shifted somewhat. Alternatives 1, 2, and 2M have very similar amounts of predicted road mileage, Alternative 4 has slightly less mileage, and Alternative 3 substantially less. For all alternatives, potential road miles range from 48 to 127 for the entire decade, which averages out to 4.8 to 12.7 miles per year. More road miles are needed in all alternatives because more harvest is projected in stands farther from existing roads. The ranges of road miles for the alternatives are greater as well, indicating that there are more road options available.

Table S-41. Miles of Road by Alternative for Decade 5 Based on Maximum Harvest Levels and Harvest Distance From Roads

Indicator	Distance to Road (Miles)	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Maximum Acres Harvested	0 to 3/8	27,037	19,149	21,404	16,386	18,297
	3/8 to 6/8	12,364	12,586	10,401	11,468	10,777
	6/8 to 9/8	7,909	13,113	12,682	5,504	4,460
	> 9/8	10,312	7,244	7,034	5,619	10,047
	Totals	57,622	52,092	51,521	38,977	43,581
Harvest Using New and Existing Maintenance Level 3, 4, and 5 Roads, and Reconstructing Existing Maintenance Level 1 and 2 Roads	0 to 3/8	0.0	0.0	0.0	0.0	0.0
	3/8 to 6/8	25.9	26.3	21.8	24.0	22.5
	6/8 to 9/8	16.5	28.5	31.5	11.6	9.4
	> 9/8	27.0	15.4	15.0	12.4	32.6
	Totals	69.4	70.1	68.3	48.0	64.5
Harvest Using New Maintenance Level 3, 4, and 5 Roads, and Reconstructing Existing Maintenance Level 1 and 2 Roads	0 to 3/8	0.0	0.0	0.0	0.0	0.0
	3/8 to 6/8	25.9	26.3	21.8	24.0	22.5
	6/8 to 9/8	33.0	54.8	53.3	23.3	18.8
	> 9/8	65.3	46.1	45.0	36.0	63.0
	Totals	124.1	127.1	120.0	83.3	104.3
Estimated Range of Road Miles for the Decade		69 – 124	70 – 127	68 – 120	48 – 83	64 - 104

Relative potential change in public motorized access related to MP allocation by alternative - Another way to look at opportunities for road construction, reconstruction, and public motorized access is by comparing the amount of land allocated by alternative to MPs that restrict these activities. These MPs are Designated Wilderness (5.0), Recommended Wilderness (5.1), Backcountry Recreation (6.2), and selected Special Areas, such as NRA backcountry recreation areas (8.1 SPNM), Ecological Areas (8.4), and Candidate Research Natural Areas (8.5). The acres of these MPs by alternative are shown in Table S-42.

Table S-42. Acres of MPs that would Prohibit Public Motorized Access by Alternative

Area	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
MP 5.0 Acres	78,700	78,700	78,700	78,700	78,700
MP 5.1 Acres	0	27,700	27,700	99,400	0
MP 6.2 Acres	124,500	97,500	106,800	225,900	51,000
MP 8.1 SPNM Acres	0	24,900	24,900	13,000	24,900
MPs 8.4, 8.5	2,030	2,020	3,960	2,020	2,020
Total Acres	**205,230**	**230,820**	**242,060**	**419,020**	**156,620**

The alternative that would have the most direct effect on prohibiting public motorized access is Alternative 3, followed in descending order by Alternatives 2M, 2, 1, and 4. Compared to the

current condition, represented by Alternative 1, Alternatives 2 and 2M would increase the amount of land that is off-limits to public motorized access by 25,590 acres and 36,830 acres, respectively. These acres represent about 3 and 4 percent of the Forest, respectively. Alternative 3 would more than double the current acres, and the increase would represent over 23 percent of the Forest land base. Conversely, Alternative 4 would reduce the amount of land off-limits to public motorized access by 48,600 acres, or about 5 percent of the Forest. Alternative 4 would accommodate those who favor more public motorized access on the Forest, whereas those who favor less public motorized access would be best accommodated by Alternative 3, and to a much lesser extent by Alternatives 2M and 2.

Social and Economic Environment

Indicators and Effects for Issue #1

Population - Forest Plan alternatives could have an indirect influence on county or community populations, but how and where this influence would occur cannot be predicted with any accuracy. For example, all alternatives have the potential to increase timber production, but whether these jobs translate into population increases would depend on how much new and relatively permanent industry is created within the Forest region. Because the difference in the maximum potential of timber production between alternatives is not substantial (50 to 80 mmbf range), it is doubtful that this influence on population would vary much by alternative. It is also doubtful that an increase or decrease in backcountry recreation would have much effect on population trends.

Lifestyles and Social Organization - Under all alternatives, rural communities would likely continue to provide opportunities for resource-dependent lifestyles; however, these communities would also likely continue to look for opportunities to diversify their economies. Although the differences between alternatives are not great, Alternative 4 may provide somewhat more opportunity to increase forestry-related or wood product manufacturing jobs in communities, whereas Alternative 3 may provide more outdoor recreation or recreation-based tourism opportunities. The overall effects of any alternative, however, would not likely have a dramatic influence on the existing lifestyles or social organization of communities in the Forest region.

Attitudes, Beliefs, and Values Toward Land Use Patterns - Rural areas within the Forest region are expected to grow only slightly over the next few decades. Many of the rural areas encompass large areas of federally-managed land. Under all alternatives, land use patterns would likely remain the same, with a mix of managed and unmanaged land. Under Alternative 4, there would likely be a somewhat higher percentage of managed land than under the remaining alternatives. Under Alternative 3, there might be a shift in population to wildland interface areas as more new residents, attracted to non-motorized recreation and/or roadless features, move in. However, it is more likely that there would continue to be a mix of attitudes, beliefs, and values toward land uses and patterns in local counties and communities that tend to polarize around Forest-related issues such as wilderness, commodity production, and recreation uses. These attitudes, beliefs, and values would not likely change by alternative or because of the alternatives.

Civil Rights/Environmental Justice - Under all alternatives, it is likely that the people in the Forest region will become racially more diverse, while remaining largely Caucasian and Anglo-Saxon. Effects would not likely change by alternative or because of the alternatives. There is no indication that any of the alternatives would adversely or disproportionately affect racial minorities or low income groups.

Employment - The Forest generates money through various sources, and this money has the ripple effect of creating or sustaining jobs in its area of influence. These jobs were estimated for the next ten years, and they are displayed in Table S-43.

Table S-43. Employment by Source by Alternative (Average Annual, Decade 1)

Source	Number of Forest-Linked Jobs					
	Current	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Recreation Visits	596	753	753	753	753	753
Wildlife and Fish Related Visits	240	322	322	322	322	322
Livestock Grazing	6	6	6	6	6	6
Timber Harvest	142	748	746	742	577	945
Mineral Operations	12	12	12	12	12	12
Payments to States/Counties	54	54	54	54	54	54
Other Forest Service Expenditures	253	291	283	283	271	299
Total Forest-Linked Jobs	1,303	2,186	2,176	2,172	1,995	2,391
Percent Change from Current	---	67.8%	67.0%	66.7%	53.1%	83.5%

Forest Service-linked employment is expected to be relatively static under all alternatives in the next 10 years for all Forest sources except timber harvest. Timber-related increases in employment are estimated by alternative based on maximum projected volume outputs generated by the Spectrum model to achieve desired vegetation conditions for the Forest. Increases in projected employment over current levels range from 53 percent in Alternative 3, to 83 percent in Alternative 4.

Table S-44 displays how the jobs generated in Table S-43 would be distributed within the major industrial sectors found in the MNF 10-County Region. The Forest-linked jobs would ripple through all sectors of the economy; however, some sectors would be affected more than others. The Agriculture and Manufacturing sectors, for example, show triple or quadruple their jobs, while other sectors show more modest gains, depending on the alternative. The larger increase in the Agriculture and Manufacturing sectors are directly related to the substantial increase projected for the timber harvest source, whereas the other sectors are showing more indirect or induced effects from projected increases in all source revenues.

Table S-44. Employment by Industry Sector by Alternative (Average Annual, Decade 1)

Industry	Number of Forest-Linked Jobs					
	Current	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Agriculture	50	224	202	201	181	247
Mining	18	21	21	21	20	21
Utilities	4	7	7	7	6	8
Construction	23	29	29	29	28	31
Manufacturing	80	343	362	359	265	457
Wholesale Trade	51	79	79	79	74	85
Transportation & Warehousing	22	46	47	47	40	54
Retail Trade	232	311	311	311	302	321
Information	6	10	10	10	10	11
Finance & Insurance	7	14	14	14	12	16
Real Estate & Rental & Leasing	20	30	29	29	28	32
Professional, Scientific & Tech Services	23	34	34	34	31	37
Management of Companies	2	5	5	5	4	5
Administration and Waste Management	11	20	20	20	19	22
Educational Services	5	8	8	8	7	8
Health Care & Social Assistance	40	69	69	69	62	76
Arts, Entertainment, and Recreation	47	69	69	69	69	70
Accommodation & Food Services	422	559	559	559	553	567
Other Services	31	67	67	66	57	77
Government	209	241	236	236	229	245

Income - The money and jobs that the Forest generates through its programs and payments also ripple through the economy as income. This income was estimated by alternative for the next 10 years and is displayed below in Table S-45.

Table S-45. Labor Income by Source by Alternative (Average Annual, Decade 1)

Source	Forest-Linked Income (in Thousands of 2005 Dollars)					
	Current	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Recreation Visits	12,921	16,348	16,348	16,348	16,348	16,348
Wildlife and Fish Related Visits	4,929	6,855	6,855	6,855	6,855	6,855
Livestock Grazing	38	38	38	38	38	38
Timber Harvest	4,629	24,846	24,546	24,390	19,201	31,062
Mineral Operations	427	427	427	427	427	427
Payments to States/Counties	2,136	2,136	2,136	2,136	2,136	2,136
Other Forest Service Expenditures	10,783	12,421	12,073	12,061	11,538	12,742
Total Forest-Linked Income	$35,863	$63,071	$62,423	$62,255	$56,544	$69,608
Percent Change from Current	---	75.9%	74.1%	73.6%	57.7%	94.1%

Similar to jobs, Forest-linked income is expected to be relatively static under all alternatives for all Forest sources except timber harvest. Increases in projected income over current levels range from 58 percent in Alternative 3, to 94 percent in Alternative 4. The income percentage increases are somewhat higher than the job percentage increases in Table S-43 because the

additional timber and manufacturing jobs created would provide relatively high income for jobs for this region.

Table S-46 displays how the income generated in Table S-45 would be distributed within the major industrial sectors found in the Forest's area of influence. Not all income is accounted for as some would fall outside of the sectors listed in the table.

Forest-linked income would ripple through all sectors of the economy; however, some sectors would be affected more than others. The Agriculture and Manufacturing sectors, for example, nearly triple or quadruple their jobs, while other sectors show more modest gains, depending on the alternative. Again, the larger increases in the Agriculture and Manufacturing sectors are directly related to the substantial increase projected for the timber harvest source, whereas the other sectors are showing more indirect or induced effects from projected increases in all source revenues.

Table S-46. Labor Income by Sector by Alternative (Average Annual, Decade 1)

Industry	Forest-Linked Income (in Thousands of 2005 Dollars)					
	Current	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Agriculture	1,244	8,313	7,368	7,319	6,565	9,215
Mining	1,123	1,336	1,334	1,334	1,322	1,348
Utilities	324	657	663	661	575	759
Construction	796	1,010	996	994	944	1,056
Manufacturing	2,572	10,935	11,517	11,462	8,416	14,568
Wholesale Trade	1,989	3,053	3,065	13,044	2,862	3,286
Transportation & Warehousing	667	1,483	1,518	1,513	1,267	1,774
Retail Trade	4,158	5,662	5,643	5,638	5,462	5,863
Information	190	308	307	306	283	334
Finance & Insurance	241	506	504	502	440	579
Real Estate & Rental & Leasing	315	475	468	467	432	511
Professional, Scientific & Tech Services	773	1,182	1,174	1,171	1,076	1,284
Management of Companies	136	260	260	260	232	293
Administration and Waste Management	202	340	341	341	311	375
Educational Services	73	122	121	121	111	134
Health Care & Social Assistance	1,299	2,240	2,217	2,211	2,013	2,466
Arts, Entertainment, and Recreation	903	1,323	1,323	1,322	1,313	1,334
Accommodation & Food Services	7,611	10,329	10,325	10,323	10,239	10,426
Other Services	556	1,242	1,242	1,237	1,059	1,449
Government	10,691	12,295	12,037	12,028	11,622	12,555

Federal Payments to Counties - The Forest makes payments to counties through two primary sources: 25% Fund/Stabilized Payments, and Payments In Lieu of Taxes (PILT). The 25% Fund/ Stabilized Payments are made to the State of West Virginia for redistribution to counties in proportion to the number of acres of National Forest System land within each county. Payments are generally limited to use for schools and roads. Currently, Barbour, Grant, and Nicholas Counties receive the 25 Percent Fund, while the other seven counties in the Forest

region receive Stabilized Payments. The most current payments for all counties are shown in Table S-47.

Table S-47. Forest-related 25 Percent Fund/Stabilized Payments to Counties for 2005

County	Payment	% of Total
Barbour County	$8	0%
Grant County	$43,156	2%
Greenbrier County	$218,885	12%
Nicholas County	$16,981	1%
Pendleton County	$130,659	7%
Pocahontas County	$666,828	36%
Preston County	$8,460	0%
Randolph County	$434,986	23%
Tucker County	$214,388	11%
Webster County	$142,318	8%
Totals	**$1,876,669**	**100%**

Source: USDI – www.nbc.gov/pilt/search.cfm

If the counties that have chosen Stabilized Payments return to the 25 Percent Fund, the amounts they receive would shift to 25 percent of the annual revenues generated by the Forest. Based on estimates from the IMPLAN model, these revenues could be potentially much higher than they have been in the recent past. However, based on recent history, Forest revenues have fluctuated greatly, depending primarily on how much timber is produced. Projected timber production would be highest in Alternative 4, followed closely by Alternatives 1, 2, and 2M, which have fairly similar production potential, and then Alternative 3, which has considerably less potential.

Table S-48. Forest-related PILT Payments to Counties for 2005

County	Payment	% of Total
Barbour County	$16	0%
Grant County	$17,976	2%
Greenbrier County	$154,197	13%
Nicholas County	$36,144	3%
Pendleton County	$76,625	6%
Pocahontas County	$376,270	31%
Preston County	$5,558	0%
Randolph County	$290,565	24%
Tucker County	$144,601	12%
Webster County	$93,834	8%
Totals	**$1,195,786**	**100%**

Source: USDI – www.nbc.gov/pilt/search.cfm

Payments in Lieu of Taxes (PILT) are paid to the State of West Virginia for redistribution to the governments of counties containing specific types of federal lands, including national forests.

Counties receive payments in proportion to the amount of acreage of national forest land within each county. PILT can be used for any governmental purpose. The most current payments for all counties are shown in Table S-48.

Because these payments are solely based on the amount of federal land within each county, they would not be affected by Forest Plan alternatives, nor would they change by alternative. Based on payments received over the last 20 years, however, it is expected that PILT payments may continue to show modest increases over the next decade under any alternative.

Indicators and Effects for Issue #2

Net Present Value (NPV) - This analysis includes both non-market values (economic efficiency) and market prices or revenues (financial efficiency). In deriving NPV figures, costs are subtracted from revenues to yield a net value. "Future values" (i.e., revenues received in the future) are discounted using an appropriate discount rate to obtain a "present value". The costs used in this analysis are the estimated budget costs for fiscal year 2002.

Table S-49 displays the economic and financial NPV for each alternative. The reduction of NPV in any alternative as compared to the most financially efficient solution is the economic trade-off, or opportunity cost, of achieving that alternative.

Table S-49. Economic and Financial Efficiency by Alternative

Alternative	Assigned Values (Economic Efficiency)	Market Price or Value	Market and Non-market Values NPV (Financial Efficiency)
Alternative 1	$1,391,902	$453,373	$1,845,274
Alternative 2	$1,391,902	$428,708	$1,820,609
Alternative 2M	$1,391,902	$423,797	$1,815,699
Alternative 3	$1,391,902	$314,776	$1,706,677
Alternative 4	$1,391,902	$518,541	$1,910,442

Economic efficiency does not change by alternative because the non-market assigned values are the same for all alternatives and they are not expected to change quantifiably by alternative over time. The market value differences are primarily related to timber costs and revenues, which do vary by alternative. When combined together, all alternatives show a net positive value, but all alternatives are fairly close in NPV, with only a 11.9 percent difference between the highest (Alternative 4) and the lowest (Alternative 3).

THE PREFERRED ALTERNATIVE

The Preferred Alternative identified in the FEIS is Alternative 2 Modified (2M). Alternative 2M is essentially Alternative 2, the Preferred Alternative in the DEIS, with minor changes in direct response to public comments on the DEIS and Proposed Revised Forest Plan.

Along with the Responsible Official's discretion, specific decision criteria were used to help choose the Preferred Alternative. These decision criteria were generally tied to the major Need For Change topics in plan revision, and each criterion had a set of representative indicators that were used in the EIS analyses found in Chapter 3. Not all indicators in the EIS were used, as some were duplicative or did not show a clear difference in impacts between alternatives.

Criterion 1: The extent to which the alternative maintains or restores water quality and the soil productivity necessary to support ecological functions in upland, riparian, and aquatic areas.

Criterion 2: The extent to which the alternative maintains or restores plant and animal diversity and provides habitats needed to sustain viable populations of native and desired non-native species, including threatened and endangered species, and management indicator species.

Criterion 3: The extent to which the alternative maintains or restores forest vegetation to ecological conditions with reduced risk of damage from fires, insects, diseases, and invasive species.

Criterion 4: The extent to which the alternative provides settings for a variety of recreation opportunities, including backcountry use within a semi-primitive non-motorized recreation setting.

Criterion 5: The extent to which the alternative provides a variety of uses, values, products and services for present and future generations by managing within the capability of sustainable ecosystems.

Alternative 2M is rarely the most effective in addressing the criteria and indicators, but it is never the least effective, and it is the best alternative at consistently addressing the range of criteria and indicators well. In this regard, it is the most consistent and versatile alternative in effectively addressing a wide variety of issues and concerns. Alternative 2M is preferred because, overall, it maximizes the net benefits to the public by addressing their issues and establishing a multiple-use framework for:

- Maintaining or restoring watershed conditions to help provide for water quality, soil productivity, and functioning riparian and aquatic habitats,
- Maintaining, restoring, or enhancing ecological conditions that will help conserve and recover listed species, and that will sustain biological diversity and species viability,
- Increasing the Forest's capability to provide high-quality outdoor recreation opportunities,
- Making timber, energy minerals, special uses, and other valuable commodities available in an environmentally sensitive manner,
- Contributing to the economic and social needs of people, cultures, and local communities by offering sustainable and diverse products, services, settings, and opportunities, and
- Providing clear direction to assist managers in making project level decisions to implement the broader social, economic and ecological goals and objectives of the 2006 Forest Plan.

Alternative 2M is described in detail under the *Alternatives Considered in Detail* section in this Summary, pages S-30 to S-32, and also includes the *Elements Common to All Alternatives* on pages S-20 through S-22. The Responsible Official's selected alternative for implementation is documented in the Record of Decision for this FEIS, along with his rationale for the selection.