

Appendix H

Biological Assessment for Threatened and Endangered Species

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BIOLOGICAL ASSESSMENT
for
THREATENED AND ENDANGERED SPECIES

Monongahela National Forest
Land and Resource Management Plan Revision

USDA Forest Service
Monongahela National Forest
Elkins, West Virginia

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EXECUTIVE SUMMARY

This Biological Assessment (BA) documents potential effects of implementation of the revised Forest Plan for the Monongahela National Forest (MNF) on nine federally listed threatened and endangered species that occur on the MNF.

Regulations implementing the National Forest Management Act (NFMA) (1976) require the Regional Forester to revise forest plans at least every 15 years. The plan is being revised to address major issues related to vegetation management, backcountry recreation, water and soil conservation, and timberland supply, as well as a number of other minor issues.

The primary focus for this BA is to document the effects of the revised Forest Plan and determine whether it is likely to 1) affect species that are listed or proposed for listing under the Endangered Species Act (ESA) of 1973, as amended; or 2) affect designated or proposed critical habitat for species listed under ESA.

This BA documents the review of office records and field sites, and the analysis of the effects of implementing the revised Forest Plan on endangered and threatened species. This BA was written using Forest-wide data on habitat and occurrences of threatened and endangered species from the files of the MNF, the West Virginia Field Office of the U.S. Fish and Wildlife Service, and the West Virginia Division of Natural Resources.

Determinations of Effect

The following determinations of effects to Threatened and Endangered species have been made as a result of this BA:

Virginia Big-Eared Bat – May affect, not likely to adversely affect the species and its designated critical habitat.

Indiana Bat – **May affect, likely to adversely affect.** No effect on designated critical habitat. The management activities that are likely to have an adverse effect include development of federal minerals, prescribed fire and wildfire suppression, road construction and reconstruction, and timber harvest (including salvage and large-scale harvesting for wildlife habitat enhancement). Management activities that are not likely to adversely affect the Indiana bat include range management, recreation management, watershed and aquatic habitat restoration, small-scale wildlife habitat management, timber stand improvement, gypsy moth control, and personal use firewood cutting.

West Virginia Northern Flying Squirrel – May affect, not likely to adversely affect.

Bald Eagle – May affect, not likely to adversely affect.

Cheat Mountain Salamander – May affect, not likely to adversely affect.

Small Whorled Pogonia – May affect, not likely to adversely affect.

Shale Barren Rockcress – May affect, not likely to adversely affect.

Virginia Spiraea – May affect, not likely to adversely affect.

Running Buffalo Clover – **May affect, likely to adversely affect.**

Currently there are no species proposed for listing on the MNF or any proposed critical habitat.

Request for Consultation - The MNF requests initiation of formal consultation on the Indiana bat and running buffalo clover, as required under ESA. The MNF also requests concurrence with “may affect, not likely to adversely affect” determinations for the Virginia big-eared bat, West Virginia northern flying squirrel, bald eagle, Cheat Mountain salamander, small whorled pogonia, shale barren rockcress, and Virginia spiraea.

INTRODUCTION

The Forest Service proposes to revise the Forest Plan for the Monongahela National Forest. This Forest Plan was originally approved and released in 1986, and includes 6 significant amendments that have occurred since. The Forest Plan establishes direction for managing resources on National Forest System lands within the proclaimed boundaries of the Monongahela National Forest.

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. Endangered Species Act consultation for the Forest Plan is considered programmatic, or tier 1 consultation, which addresses the general type and overall magnitude of effects expected from implementing the Plan.

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. Endangered Species Act consultation at the project level is considered tier 2 consultation, which addresses the site-specific effects of the action under consideration.

The revised Forest Plan includes much of the direction and many of the prescriptions found in the 1986 Plan and its amendments. The revised Forest Plan also proposes new direction and new prescriptions, based on the Need for Change identified during scoping. The revised Forest Plan will replace the 1986 Plan and amendments once the responsible official signs the Record Of Decision for this revision.

The purpose of this document is to evaluate the effects of the Proposed Action (the revised Forest Plan) on species listed or proposed for listing as threatened or endangered (TEP species) under the Endangered Species Act of 1973, as amended (ESA).

Currently there are 9 federally listed threatened and endangered species known to occur on the MNF, but no species that are proposed for listing:

- Virginia big-eared bat (*Corynorhinus townsendii virginianus* – endangered)
- Indiana bat (*Myotis sodalis* – endangered)
- West Virginia northern flying squirrel (*Glaucomys sabrinus fuscus* – endangered)
- Bald eagle (*Haliaeetus leucocephalus* – threatened)
- Cheat Mountain salamander (*Plethodon nettingi* – threatened)
- Small whorled pogonia (*Isotria medeoloides* – threatened)
- Shale barren rockcress (*Arabis serotina* – endangered)
- Virginia spiraea (*Spiraea virginiana* – threatened)
- Running buffalo clover (*Trifolium stoloniferum* – endangered)

Two other listed species, gray wolf (*Canis lupus* – endangered) and eastern cougar (*Puma concolor couguar* – endangered), formerly existed in the area, but are believed to have been extirpated in the late 1800s or early 1900s. One listed species, gray bat (*Myotis grisescens*), is known from one record from a winter hibernaculum survey in 1991. This record is considered accidental, and the species is not considered to occur in West Virginia. These three species will not be discussed further in this analysis.

Purpose and Need for Plan Revision

The purpose of the Proposed Action is to provide a revised Forest Plan that will: (1) guide all natural resource management activities on the Forest, (2) address changed conditions and direction that have occurred since the original plan was released, and (3) meet the objectives and requirements of federal laws, regulations, and policies.

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, instructions to revise forest plans were formulated in the Code of Federal Regulations at 36 CFR 219. These regulations have since been changed, but because the Forest began revising its plan before the new regulations were finalized, the revised Forest Plan is being prepared according to the 1982 rules. The 1982 rules require that a forest plan be revised at least every 15 years, or sooner if the Forest Supervisor determines that conditions or demands in the planning area have changed significantly. The Forest Supervisor determined that revision was warranted because of the expiration of the revision interval mandated by regulation, and because significant changes in conditions and demands have occurred since the 1986 Plan was signed.

The Monongahela National 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, involving Forest Service employees, cooperating agencies, and non-governmental partners and interest groups, assessed new information and changed conditions that occurred during implementation of the current Forest Plan. This initial scoping produced several indicators that suggested a need for changing the existing Forest Plan:

- Land conditions have changed, as well as public demand for uses and commodities from the land.
- Laws, policies, and forest planning protocols have changed. These changes have shifted the course of agency goals and programs since 1986, and need to be addressed in Forest Plan revision.
- Annual Forest Plan implementation, monitoring, and evaluation results show that it is not always possible to implement plan direction and still achieve the plan's desired future conditions and projected outputs.
- New scientific information has become available.

Formal public scoping for Forest Plan revision was conducted during 2002. A content analysis of the comments received during scoping identified the following major Need for Change topics to be addressed by the revised Forest Plan:

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

Planning Area Description

The Monongahela National Forest comprises over 919,000 acres of National Forest System (NFS) lands in eastern West Virginia. It is, by far, the largest expanse of public land in the State. The NFS lands are interspersed with other land ownerships within the 1,700,000 acres of land contained within the Forest's proclaimed outer boundary. Figure 1 shows the location of the Monongahela National Forest proclamation boundary. 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. The Forest lies within 400 miles of an estimated 96,000,000 people.

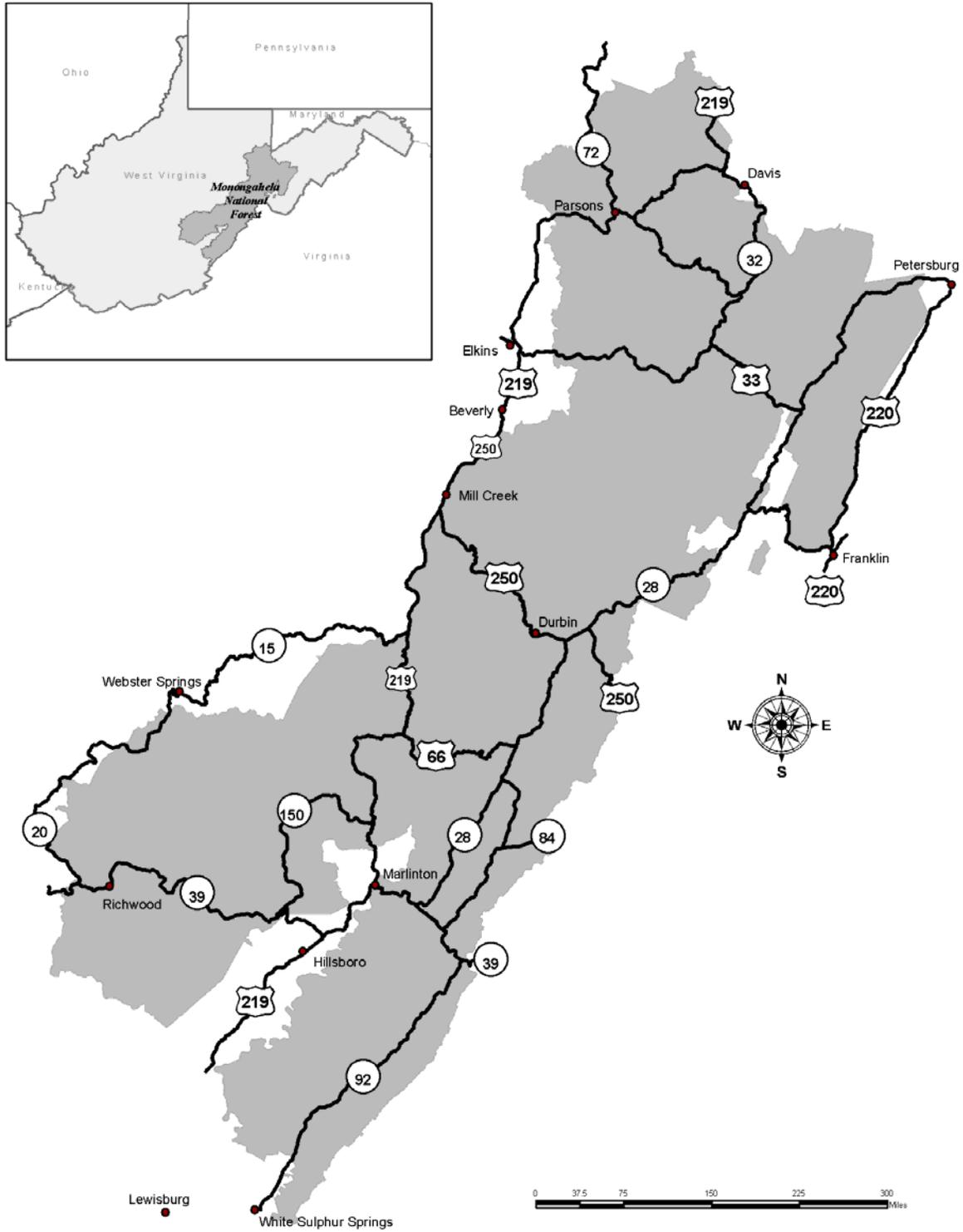
The geology of the area features steep north-south mountain ridges and deep river valleys, with elevations ranging from 900 feet near Petersburg to 4,863 feet atop Spruce Knob, West Virginia's highest point. Temperatures can vary from near 100 degrees Fahrenheit in summer to well below zero in winter. Annual precipitation ranges from about 60 inches on the west side of the Forest to about half that amount on parts of the east side.

The headwaters of six major rivers—the Cheat, Elk, Gauley, Greenbrier, Potomac, and Tygart Valley—are found on the Forest, as well as four impounded lakes—Lake Sherwood, Lake Buffalo, Summit Lake, and Spruce Knob Lake. The Forest has over 500 miles of perennial trout streams, providing more than 90 percent of the high-quality trout waters in the State. Many communities use water from the Forest for all or part of their water supplies.

Due to its geographic location, elevation range, and complex geology, the Forest has great vegetative diversity. A number of rare plants and plant communities exist, with some at their northern- or southern-most limit of their ranges. Currently 4 plant species are listed by the US Fish and Wildlife Service as threatened or endangered. There are 17 Botanical Areas established on the Forest, and rare plants or communities are also protected in National Natural Landmarks, Scenic Areas, and candidate Research Natural Areas.

The Forest provides habitat for numerous animal species, including fish, reptiles, amphibians, birds, mammals, and invertebrates. Currently, 5 animal species are listed as threatened or endangered. The Forest affords excellent opportunities for wildlife viewing, hunting, and fishing.

Figure 1. Vicinity Map for the Monongahela National Forest Proclamation Boundary



The 57,000-acre Spruce Knob-Seneca Rocks National Recreation Area is a major recreation attraction. Developed recreation opportunities are offered at over 40 campgrounds and picnic areas across the Forest. There are over 850 miles of hiking trails, including the Allegheny National Recreation Trail and the Greenbrier Historic Trail. The Forest manages 5 designated Wildernesses, totaling over 78,000 acres. In addition, two large backcountry areas, Cranberry and Seneca, provide semi-primitive recreation opportunities. Three Scenic Areas—Dolly Sods, Gaudineer, and Falls of Hills Creek—offer a variety of visual attractions in natural settings.

Major insect pests include the gypsy moth and hemlock wooly adelgid. The major disease concern at present on the Forest is beech bark disease complex.

There are over 60 species of trees, mostly hardwoods, but conifer species add to the visual variety. Many of the tree species have high value for timber sawlogs and other products. The Forest offers and sells timber for harvest as a way to help achieve vegetation and habitat objectives and support local and regional economies.

About 7,000 acres on the Forest are open to permitted livestock grazing.

The Forest provides the setting for 40-50 producing natural gas wells and additional wells associated with a natural gas storage field, which are regionally important energy sources. Other mineral resources include commercial quantities of coal, limestone, and gravel. Limestone geologies also contain numerous caves that are popular for recreation, and some that provide habitat for rare species.

The Forest transportation network has an estimated 1,752 miles of classified roads that range from paved highways to non-surfaced roads designed for high clearance vehicles. Many of these roads are available for pleasure driving, the removal of forest products, bicycling, and scenic viewing. Others are closed for resource protection or management reasons. The Forest is accessed by U.S. Highways 33, 219, and 250, and by State Routes 4, 28, 39, and 92.

Consultation History

In July 1985, consultation was completed for the original (1986) Forest Plan. Six species were covered in consultation: Eastern cougar (*Puma concolor cougar*), American peregrine falcon (*Falco peregrinus anatum*), bald eagle, West Virginia northern flying squirrel, Indiana bat, and Virginia big-eared bat. The USFWS opinion indicated that Forest Plan implementation likely would not jeopardize the continued existence of the eastern cougar, Virginia big-eared bat, and Indiana bat. Their opinion for the peregrine falcon and bald eagle was that Forest Plan implementation would promote the conservation of these species. Similarly, for the West Virginia northern flying squirrel, their opinion was that implementation likely would not jeopardize its continued existence, and may promote its conservation. Cheat Mountain salamander, shale barren rock cress, Virginia spirea, running buffalo clover, and small-whorled pogonia were not included in this consultation because they were not listed species at that time. The peregrine falcon has been delisted since the approval of the 1986 Forest Plan.

Between 1988 and 1992, the Forest Plan was amended 5 times. For amendments that could affect TEP species, such as amendment #4 (October 1992 revised standards and guidelines for leasing and developing federally-owned oil and natural gas), USFWS was consulted prior to amendment approval.

In March 2004 the Monongahela National Forest completed a Forest Plan amendment addressing TEP species. This amendment was driven by new information and issues that had arisen since the 1986 plan was first approved. As part of this amendment process, comprehensive assessments pertaining to the nine

federally listed species that occur on the Forest were completed. Results of these assessments are documented in the Biological Evaluation (BE) for the amendment (USDA Forest Service 2003) and in the revised Biological Assessment (BA) completed for the Forest plan as it was being implemented prior to this amendment (USDA Forest Service 2001).

During the course of the assessment, the U.S. Fish and Wildlife Service (USFWS) recommended the development of new habitat identification and management guidelines for the West Virginia northern flying squirrel. As an outcome of this collaborative effort, USFWS amended the recovery plan for this species (USFWS 2001).

The revised BA assessed the new information to evaluate the effects of continued implementation of the Forest plan on TEP species. The BA concluded that for all TEP species found on the MNF, with the exception of the Indiana bat, the continued implementation of the Forest Plan would result in a “no effect” or “may affect, not likely to adversely affect” determination. The BA further concluded that continued implementation of the Forest Plan would result in a “may affect, likely to adversely affect” determination for the Indiana bat for all activities that involve prescribed fire and tree cutting (including clearing for road construction/reconstruction and mineral exploration and development).

The Forest presented the revised BA to the USFWS for review and requested consultation as required by the ESA. USFWS concurred with the species determinations found in the revised BA and no further Section 7 consultation pursuant to the ESA was required regarding those species with no effect or may affect, not likely to adversely affect determinations. The Forest Service and USFWS entered into formal consultation for the Indiana bat on November 9, 2001 and the Service issued their final programmatic Biological Opinion (BO) and Incidental Take Statement for the Forest Plan on March 26, 2002. The incidental take statement anticipates the taking of an unquantifiable number of Indiana bats from tree removal activities and prescribed burning occurring outside of the hibernation period (April 1 – November 14) annually on the MNF. Activities authorized annually by the Incidental Take Permit include:

- Timber harvest on up to 6,000 acres,
- Road construction/reconstruction on up to 47 acres,
- Mineral development on up to 78 acres, and
- Prescribed burning on up to 300 acres.

The Threatened and Endangered Species Amendment to the Forest Plan, which incorporated the Terms and Conditions and Reasonable and Prudent Measures required by the BO, was finalized on March 12, 2004. Since the amendment was finalized, the Forest and USFWS have completed tier II (project level) formal consultation for the Indiana bat on three timber sale projects and several smaller projects.

PROJECT DESCRIPTION

The Proposed Action is plan revision Alternative 2, which is referred to in this document as the revised Forest Plan. The Forest believes that this alternative best meets the Need for Change topics identified during scoping, while maintaining a variety of outputs of goods and services. Three other alternatives were studied in detail, including a No Action Alternative that would continue management under the current plan, an alternative that emphasizes remote backcountry, and an alternative that emphasizes age class diversity and vegetation restoration. These other alternatives are described in detail in the EIS for plan revision (USDA Forest Service 2005). However, this BA addresses only the revised Forest Plan

(Alternative 2). Plan revision documents can be accessed at:
http://www.fs.fed.us/r9/mnf/plan_revision/plan_revision.htm.

The main intent of the revised Forest Plan is to address Need for Change topics that initiated Forest Plan revision. A basic assumption is that some management emphasis and direction across the Forest should be adjusted to address Need for Change topics. However, some features of the revised Forest Plan represent little change or maintain the status quo relative to the existing Forest Plan. 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 the existing Forest Plan to the revised Forest Plan, see the Comparison of Alternatives section in Chapter 2 of the plan revision EIS and the effects analyses of the alternatives in Chapter 3 of the EIS (USDA Forest Service 2005, http://www.fs.fed.us/r9/mnf/plan_revision/plan_revision.htm).

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 Management Prescription (MP) levels. This direction emphasizes diversity across the landscape for forest ecosystems and the habitats they provide.

- 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 prescribed fire 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.

- Update Forest-wide and MP 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.

Backcountry Recreation

The Need for Change identified for this topic was:

- Develop a new MP (5.1) for managing Recommended Wilderness until Congress acts on the Wilderness recommendation.
- Update 6.2 MP direction as needed and consider adjusting allocations of 6.2 based on the roadless/wilderness evaluation, the Recreation Opportunity Spectrum Map.

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 the revised Forest Plan, most lands that qualified as Inventoried Roadless Areas were assigned to MP 6.2 or MP 5.1. The exception was an IRA in the Spruce Knob-Seneca Rocks NRA. This tract was assigned to the NRA MP, but will still be managed as remote backcountry. Most lands that did not qualify for the inventory, usually because of small size and/or development impacts, were assigned to one of the non-remote backcountry MPs.

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 into the revised Forest Plan to provide for stream channel and wetland protection. A new section in the Forest-wide direction of the revised Forest Plan was created.

- Update Forest-wide and MP 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.

- Address acid deposition and sedimentation concerns through additions to Forest-wide direction, MPs, and monitoring.

Timberland Supply

The Need for Change identified for this topic was:

- Revisit suitable lands determination, revise supply and demand estimations, and recalculate Allowable Sale Quantity (ASQ) based on those changes. ASQ is the maximum amount of timber allowed to be harvested from suitable timber lands.

Timberland capability and suitability were re-assessed for Forest Plan revision (see Timber Resources section, Chapter 3). Specific MPs (3.0, 4.1, and 6.1) contain suited timberlands, although each MP has a somewhat different emphasis for vegetation management (see MP descriptions below). The ASQ was calculated 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. 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 changes in the program since 1986.
- Land acquisition priorities have been updated, and new lands acquired since 1986 have been given a MP.
- 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 (see Appendix D).
- 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 Forest Plan, including the strategy 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 National Recreation Area was given its own MP.
- MPs (1.1 – Mineral Development, 2.0 – Uneven-aged Management, 4.0 – Conifer Management, 9.0 – Unsuitable Lands) that were outmoded or never used to manage resources were eliminated.
- Forest Plan amendments were incorporated into the revised Forest Plan where appropriate.

Management Prescriptions

MPs are somewhat different than the prescriptions used in the existing Forest Plan. Several MPs used to manage habitat for TEP species have been converted to Forest-wide direction, which will be applied wherever such habitat occurs, regardless of MP. These include the following:

- MP 6.3 – Indiana bat primary range
- MP 8.0, Opportunity Area 838 – Maternity sites, hibernacula, and key areas for Indiana bats
- MP 8.0, Opportunity Area 837 – summer colonies, hibernacula, and corridors for Virginia big-eared bats
- MP 8.0, Opportunity Area 832 – West Virginia northern flying squirrel suitable habitat

In addition to being converted to Forest-wide direction, most of the land area represented by Opportunity Area 832 has been included in MP 4.1, which emphasizes restoration of spruce forest. In general, the direction contained in the Threatened and Endangered Species Amendment to the Forest Plan has been carried over into the revised Forest Plan. However, the wording of some of the direction has been changed to clarify the intent and enhance readability. Also, several process-related items dealing with consultation procedures and the Terms and Conditions of the Programmatic BO have been deleted. These items were determined to be mandatory to maintain compliance with ESA and the Terms and Conditions of the BO, so repeating them in the Forest Plan is unnecessary. Appendix A contains a detailed account of the disposition of all of the direction from the Threatened and Endangered Species Amendment.

In addition to the MP changes related to TEP species, MPs 1.1, 2.0, 4.0, and 7.0 are no longer used. A new prescription, MP 4.1, has been created to emphasize restoration of spruce and spruce-hardwood communities. Forest lands within the NRA have been given a new MP, 8.1. Displayed as a percent of the Forest, the major MPs under the revised Forest Plan are:

- 6.1 – Wildlife Habitat Diversity (30.3 percent),
- 3.0 – Age Class Diversity (21.2 percent)
- 4.1 – Spruce and Spruce Hardwood Restoration (16.8 percent)
- 6.2 – Backcountry Recreation (11.5 percent)
- 5.0 – Designated Wilderness (8.6 percent)
- 8.0 – Special Areas (8.6 percent)
- 5.1 – Recommended Wilderness (3.0 percent)

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.

4.1 – Spruce and Spruce-Hardwood Restoration. This management prescription focuses on restoration and management of the disjunct red spruce and spruce-hardwood community of the central Appalachians. 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 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.

8.0 – Special Areas. This prescription applies to lands that emphasize the preservation of special ecosystems, areas for scientific research, or unique areas with national significance. The areas included in this prescription are scattered throughout the Forest and are of varying sizes. Their unique characteristics are recognized by a variety of administrative designations. The management emphasis varies from area to area depending on the special attribute or attributes for which an area was designated. 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).

Strategy for Addressing the Major Issues

Vegetation Management

Specific desired conditions, goals, and objectives for age class diversity, species composition, and vegetation components were developed at the Forest-wide and MP levels. MPs 2.0 and 4.0 were determined to be unnecessary and were eliminated. Prescription areas for 6.1 and 3.0 were shifted around to better reflect the potential for different types of vegetation management. MP 6.1 was revised to reflect a greater emphasis on oak ecosystem maintenance and restoration, and MP 4.1 was created to emphasize restoration of the spruce ecosystem. MPs 6.1 and 4.1 comprise an estimated 47 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 Programmatic BO and Incidental Take Statement for the Threatened and Endangered Species Amendment to the 1986 Forest Plan. However, to help achieve desired oak ecosystem restoration, the Forest is proposing to increase the prescribed fire objective to 10,000 to 30,000 acres per decade. Many more acres probably could be treated using prescribed fire, but this objective was based on an estimate that the Forest probably has the ability to accomplish a decadal average of about 3,000 acres per year. Also, because of habitat enhancement objectives outside of the suitable timber base, the total amount of timber harvest under the revised plan could exceed 6,000 acres.

Timber Supply

MPs associated with suited timberlands (3.0, 4.1, 6.1) comprise an estimated 68 percent of the Forest. These MPs represent the most likely areas where localized harvest-related activities would occur during the planning period. Within these MPs, however, are many areas where timber production will not occur on a regulated basis. These areas include roads and waterways, stream channel and wetland buffers, recreation and other administrative sites, cultural resource sites, mining sites, habitats for TEP species, extremely steep or rocky areas, and areas that have restricted access. Adjusted accordingly, there are an estimated 328,000 acres of suited timberlands (36 percent of the Forest), and the ASQ for those suitable lands is estimated at a decadal average of 60 million board feet per year.

Backcountry Recreation

MPs that emphasize undeveloped recreation (6.2, 5.0, 5.1, SPNM portions of the NRA) comprise an estimated 26 percent of the Forest. Four areas (3 percent of the Forest) are recommended for wilderness (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 and can be used for administrative access.

Water and Soil

MPs that would have low potential for management-related disturbance to soil and water resources (5.0, 5.1, 6.2, 8.0, portions of 4.1 that are not suitable timberland) comprise an estimated 46 percent of the Forest. Within areas that allow a higher level of disturbance, stream channel and wetland buffers provide a high level of protection for soil, water, riparian, and aquatic resources. 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.

Table 1 shows the amount of land allocated to each MP for the revised Forest Plan. Acres are rounded off to the nearest hundred. Figure 2 shows the spatial distribution of the MP allocations.

Table 1. Management Prescription acres for the revised Forest Plan.

Number	Management Prescription	Acres	Percent of Forest
3.0	Age Class Diversity	194,600	21.2
4.1	Spruce and Spruce-Hardwood Restoration	153,600	16.8
5.0	Designated Wilderness	78,900	8.6
5.1	Recommended Wilderness ¹	27,300	3.0
6.1	Wildlife Habitat Diversity	277,600	30.3
6.2	Backcountry Recreation	105,600	11.5
8.0	Special Areas	79,100	8.6

¹Recommendations for Wilderness 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.

Management Activity Categories Analyzed in this Programmatic Biological Assessment

Mineral Operations

Natural gas leasing, exploration, recovery, and underground storage are by far the most common forms of mineral development on the Forest. Typical activities involve seismic exploration, drilling and operation of gas wells, construction of access roads, and construction and operation of pipelines. Including both production wells and wells associated with underground gas storage, there are currently 71 existing, active gas well sites on NFS land. On average, each well site is about 2 acres with grassy ground cover, similar to hayfields. Access roads and associated pipelines create narrow linear openings and may add up to an additional 14 acres of grassy or graveled area per well site. The total acreage of surface modification is considerably less for many well sites because they are served by existing roads or the associated pipelines are co-located with roads.

Reasonably foreseeable gas development (RFD) has been projected and described for the Forest. The RFD is a projection of the likelihood of gas exploration, development, production and related activities within the MNF proclamation boundary and purchase units. The Forest's RFD was prepared in May 1990 and updated and validated in 2003. The RFD projects approximately 740 acres of total surface modification (wells, roads, and pipelines) per decade, including all land ownerships in the proclamation/purchase unit boundary, as well as both federal and privately-owned gas. Due to intermingled private and federal land and mineral ownership, about a third to half of the projected development could result from developing federal gas. The actual area of surface modification to date has been substantially below RFD projections due to lower than predicted levels of development and development methods that reduce surface disturbance (e.g., directional drilling from a central location, co-locating roads and pipelines).

Oil has never been found in commercial quantities on the MNF, and there is only a low probability for its occurrence. Therefore, oil exploration and development will not be considered further in this BA.

Active coal mining on the MNF ceased in the early 1990s. No coal mine permit applications on NFS land are pending or known to exist. At current and foreseeable coal prices, the MNF does not expect to see major or extensive coal mine development, and very probably no leasing and development of federally owned coal over the next 10-15 years. However, some underground coal mine development is possible in association with the exercise of privately owned coal rights.

Range

Range management on the MNF consists of livestock grazing by private permittees on approximately 7,000 acres of pasture land. The pasture land is scattered across the Forest in allotments of varying size. Range management is guided by site-specific allotment management plans that address potential effects to other resources.

Activities associated with range management can include construction and maintenance of fences, loading chutes, water sources, and other small structures; application of seed, lime, and fertilizer to pastures; and control of competing vegetation through mowing or herbicide application.

Development of new range allotments is expected to be limited to newly acquired land that is already pasture or hay land. The amount of range land on the Forest has been declining over several decades. For the foreseeable future, the amount of range land is not expected to increase.

Fire

Fire management activities on the MNF include suppression of wildfires and the use of prescribed fire to meet vegetation management objectives. The Forest has 10 or less reported wildfires each year, with the average size less than an acre. Over 90 percent of the reported or suppressed fires are human-caused. Research indicates that fire played an important historic role in maintaining plant communities in fire-adapted portions of the Forest. Prescribed fire generally has been used on fewer than 300 acres of the Forest annually, but as mentioned above, the revised plan contains objectives to increase this amount up to ten-fold to achieve ecosystem restoration and management goals.

Fire management activities can involve construction of fire lines using hand tools and mechanized equipment, application of water or chemical fire retardants, and use of incendiary devices to ignite prescribed fires. Fire lines are rehabilitated promptly, using water bars and revegetation where necessary to prevent erosion. Prescribed burning is conducted under project-specific burn plans that address potential effects on other resources.

Roads

Roads are constructed, reconstructed, and maintained where vehicular access is necessary to meet management objectives. Most Forest roads are constructed to facilitate timber harvest, but roads may also provide access for recreation, wildlife habitat management, mineral operations, special uses, access to private property, etc. Roads on the MNF include permanent system roads needed for long-term management and temporary roads that are used to meet short-term management objectives. User-created or "woods roads" also exist in many locations. Unneeded roads are decommissioned or obliterated where necessary to prevent or mitigate resource damage.

The revised Forest Plan does not contain objectives for mileage of road construction and reconstruction because road needs are difficult to predict without conducting site-specific, project-level planning. However, the revised Forest Plan contains a goal to provide developed roads to the density and maintenance level needed to meet resource and use objectives. The current Forest road system, not including temporary roads and woods roads, is estimated at 1,752 miles. Road construction and reconstruction is not expected to exceed 200 to 250 miles over the next 10 years. The revised Forest Plan contains an objective to decommission at least 30 miles of roads over the next 10 years.

Road construction involves removal of vegetation along the road alignment, cut-and-fill as necessary to create a level road bed, installation of drainage structures, and grading of the road surface. Gravel is applied to the surface of high-standard system roads. Gravel may be applied to other roads if necessary to prevent erosion, sedimentation, and road surface damage. Roads that receive heavy use by the public may be paved. Road reconstruction is similar to construction, but usually requires less cut-and-fill and grading work.

Road maintenance involves grading and adding gravel as necessary to maintain a smooth travel surface, cleaning or replacing drainage structures when necessary, and mowing or trimming encroaching vegetation.

Recreation

The MNF hosts a wide variety of recreational activities, including camping, hiking, backpacking, hunting, fishing, wildlife viewing, scenery viewing, mountain biking, horseback riding, picnicking, rock climbing, spelunking, and driving for pleasure. The revised Forest Plan allows for ATV use on designated trails within specific Management Prescriptions. Currently the Forest does not have any designated routes open to ATV use, although unauthorized use occurs in scattered locations. Visitor use estimates indicate that the MNF receives over one million visits annually.

Several commercial outfitter/guides operate under recreational special use permits. Such permits are also used to manage occasional recreation events such as bicycle races.

The MNF's recreational emphasis is on backcountry and undeveloped recreation, with most developed and resort-type recreation in the region occurring in nearby state parks and private resorts. However, the MNF does provide developed recreation opportunities at several campgrounds, visitor's centers, picnic areas, and man-made lakes.

Overall recreational use of the MNF is expected to increase in the foreseeable future in conjunction with population increases in metropolitan areas of the eastern U.S. No new major recreational developments are expected in the foreseeable future, although existing facilities may be rehabilitated or reconstructed to meet visitor expectations and demands. Limited new construction of trails and other dispersed facilities may occur in response to specific user needs; however, a general expansion of the trail system and other facilities is not expected.

Watershed and Aquatic Habitat Restoration

Watershed improvement activities include riparian area protection and restoration, road obliteration to address sedimentation issues, structural or vegetative bank stabilization, and efforts to revegetate and stabilize exposed soils. The most extensive form of aquatic habitat management on the MNF is the application of limestone sand to streams that have been impacted by acid deposition. Aquatic habitat management may also include construction of in-stream habitat structures, as well as addition of large woody debris to streams that are deficient in that habitat component.

The revised plan does not contain specific quantitative objectives for watershed and aquatic habitat restoration. It is anticipated that opportunities will be identified during watershed and project-level planning. Activities are expected to be scattered and small-scale in nature, and any vegetation and soil disturbance is expected to be short-term and minor in extent.

Salvage

Salvage logging may occur where timber stands have been damaged or killed by natural forces such as insects, disease, wind, ice, or fire. Natural disturbances on the MNF typically are small and scattered, and usually do not reach a scale that would facilitate viable salvage sales. Therefore, salvage logging does not represent a substantial component of the total timber harvested in any given year. However, large-scale salvage could occur in the event of a landscape-scale disturbance. The amount of salvage is unpredictable due to the unpredictable nature of natural disturbances.

Wildlife Habitat Management

The MNF cooperates with the West Virginia Division of Natural Resources (WVDNR) in an active wildlife habitat management program. Currently, most wildlife habitat management on the MNF consists of creating and maintaining permanent herbaceous openings to benefit turkeys, grouse, and a variety of other game and non-game species. Many of these openings are small (<2 acres) former log landings or closed roads that have been seeded. Others are larger (10+ acres) savannas that contain scattered residual trees. Many wildlife openings also contain small water holes. Desired conditions in the revised Forest Plan call for openings to occupy 3 to 8 percent of the landscape in MPs 3.0 and 6.1, and up to 5 percent in MP 4.1. Meeting these desired conditions would require the continued creation of new openings in MPs 3.0 and 6.1. The revised Forest Plan contains objectives to construct a total of 2,000 to 4,000 acres of wildlife openings in MPs 3.0 and 6.1 over the next 10 years. Other MPs allow openings, but do not have quantitative desired conditions or objectives.

Wildlife opening construction on log landings or closed roads involves ripping the soil to reduce compaction, whereas savanna construction involves clearing existing vegetation, removing roots and stumps, and tilling the soil. The MNF may soon begin experimenting with savanna establishment that leaves stumps in place, which involves less soil disturbance and uses prescribed burning for maintenance instead of mowing. In either case, soil preparation is followed by application of seed, fertilizer, lime, and mulch. Seed mixtures include a variety of native and non-native, non-invasive grasses and forbs. Fruit-producing shrubs and trees may be planted within openings or around the edges. Most openings are maintained by mowing, although the MNF may begin to use more prescribed fire for opening maintenance, especially for the larger savannas.

Spruce ecosystem restoration is another form of wildlife habitat management on the MNF. While very little active spruce restoration has been conducted to date, the revised Forest Plan contains an objective to conduct 1,000 to 5,000 acres of active spruce restoration within MP 4.1 over the next decade. Active spruce restoration would involve partial harvests, similar to thinning, single-tree selection, group selection, or two-aged harvesting. The specific silvicultural prescription would depend on site-specific conditions. The harvesting is intended either to release spruce trees established in the understory and midstory, or to encourage establishment of spruce from seed provided by scattered overstory spruce. The purpose is to reestablish spruce as an overstory component while maintaining or enhancing vertical habitat structure.

Like spruce restoration, Indiana bat habitat enhancement has not been extensive to date, but is expected to increase under the revised plan. The revised plan contains an objective to conduct 3,000 to 7,000 acres of

Indiana bat habitat enhancement over the next decade. This habitat enhancement would be concentrated within Indiana bat primary range (see description below), most of which is within MP 6.1. Habitat enhancement would involve partial harvests, similar to thinning, single tree selection, group selection, two-aged harvesting, or modified shelterwood harvesting. The specific silvicultural prescription would depend on site-specific conditions. The intent of habitat enhancement is to create the semi-open stand structure that the Indiana bat is believed to prefer for roosting and foraging. To provide for potential roost trees, habitat enhancement would be designed to retain snags and favor large trees with sloughing bark.

Timber harvests provide a diversity of forest age classes, including young regenerating stands that benefit many game and non-game species. Timber harvest may also contribute to long-term sustainable mast production by regenerating stands that are nearing the end of the age range for optimum mast production. Because such habitat enhancement typically is conducted through commercial timber sales, it is included in the description of timber harvesting below.

Timber Harvest

The MNF harvests timber to provide a diversity of forest age classes and to provide timber for local and regional wood-using industries. Commercial timber harvesting is concentrated in suitable timberlands in MPs 3.0 and 6.1, and to a lesser extent MP 4.1. Each of these MPs has desired conditions for age class diversity on suitable timberland. To begin moving toward those desired conditions, the revised Forest Plan contains objectives for the amount of timber harvest to be conducted over the next decade.

Combined across all suitable timberlands in MPs 3.0, 6.1, and 4.1, revised Forest Plan objectives call for a total of 20,000 to 40,000 acres of even-aged regeneration harvesting in the next ten years.

Approximately one-third as much thinning is expected over the next decade, or approximately 7,000 to 13,000 acres. Therefore, the total amount of harvesting on suitable timber lands for the next ten years is expected to be 27,000 to 53,000 acres. This harvesting is in addition to the harvesting discussed above for spruce restoration and Indiana bat habitat enhancement. Uneven-aged regeneration harvesting may occur, but is not expected to be extensive and is not included in the acreage objectives. The average annual ASQ established by the revised plan is 60 million board feet. Harvest volume from suitable lands would reach the ASQ if the upper ends of the harvest objective ranges are met. The actual amount harvested is likely to be substantially lower than the ASQ due to budget and personnel constraints. Resource protection constraints were included in the modeled projections of ASQ, but site-specific constraints could exceed the modeled constraints and further reduce actual harvest amounts.

The even-aged harvesting methods typically used on the MNF include shelterwood, two-aged, clearcutting with reserve trees, and thinning. The seed tree method is an available option, but is not used often because most forest types on the MNF can be regenerated more efficiently through other methods. The shelterwood method harvests the mature trees in two or more removal cuts within 3 to 20 years after the initial cut. The two-aged method harvests most of the trees in the older age class to create a young age class. Harvest entries are usually scheduled 40 to 80 years apart to maintain two distinct age classes within the stand. Both the two-aged method and the shelterwood method are preferred where advanced regeneration is lacking or absent. The clearcutting with reserves method harvests most of the trees within a stand in one removal. Typically some reserve trees are left to meet wildlife habitat or other resource needs. The thinning method is an intermediate cut that prepares a stand for a regeneration harvest. This method removes high risk, low quality, diseased, and over mature trees to increase the health, development, and growth of the residual trees in a stand. One to several intermediate cuts may be applied in a stand prior to the regeneration harvest.

Uneven-aged harvest methods include single tree selection and group selection. These methods are rarely used for timber management on the MNF because they are not well-suited to regenerating red oak and black cherry, which are the most valuable timber and mast-producing tree species on the MNF. These

methods also are less economically efficient than even-aged methods. However, they may be used to achieve non-timber objectives (see descriptions of spruce restoration and Indiana bat habitat enhancement, above). The single tree selection method harvests individual trees, both large and small, favoring trees such as beech and sugar maple that are tolerant of the shade of the residual forest canopy. The group selection method removes all trees within a small area, generally at least ½ acre but typically no larger than 2 acres, within the larger forested stand. This method allows for the growth of some of the more shade intolerant trees species within the uneven-aged stand, but is not used where deer browse is a concern.

Timber harvest operations on the MNF may use ground-based yarding, helicopter yarding, cable yarding, or some combination of these methods. Ground-based yarding is the most economical and is used wherever soil and water concerns allow it. For ground-based yarding, skid trails (similar to low standard roads) are constructed into the stands to allow skidders to drag logs to landings, where they are then loaded on trucks. Helicopter yarding is used in sensitive areas, usually to reduce potential damage to soil and water. In this system, helicopters are used to transport logs to landings. Cable yarding is rarely used on the MNF, but is an available option. This method involves dragging logs to the landings using cables. All yarding methods require system roads or temporary roads to allow transport of logs via truck from the landing to the state highway system.

In addition to timber harvesting, timber management also involves site preparation and timber stand improvement activities. These activities may include treating shrubs, vines, herbaceous vegetation, undesirable tree species, and suppressed or poor-form trees. Depending on site-specific silvicultural prescriptions, treatments may include using manual or mechanical cutting, herbicides, prescribed fire, or some combination of these methods. Planting tree seedlings is sometimes used to increase the component of a desired species within a stand. Fencing may also be used to protect areas with regenerating vegetation from excessive deer browsing.

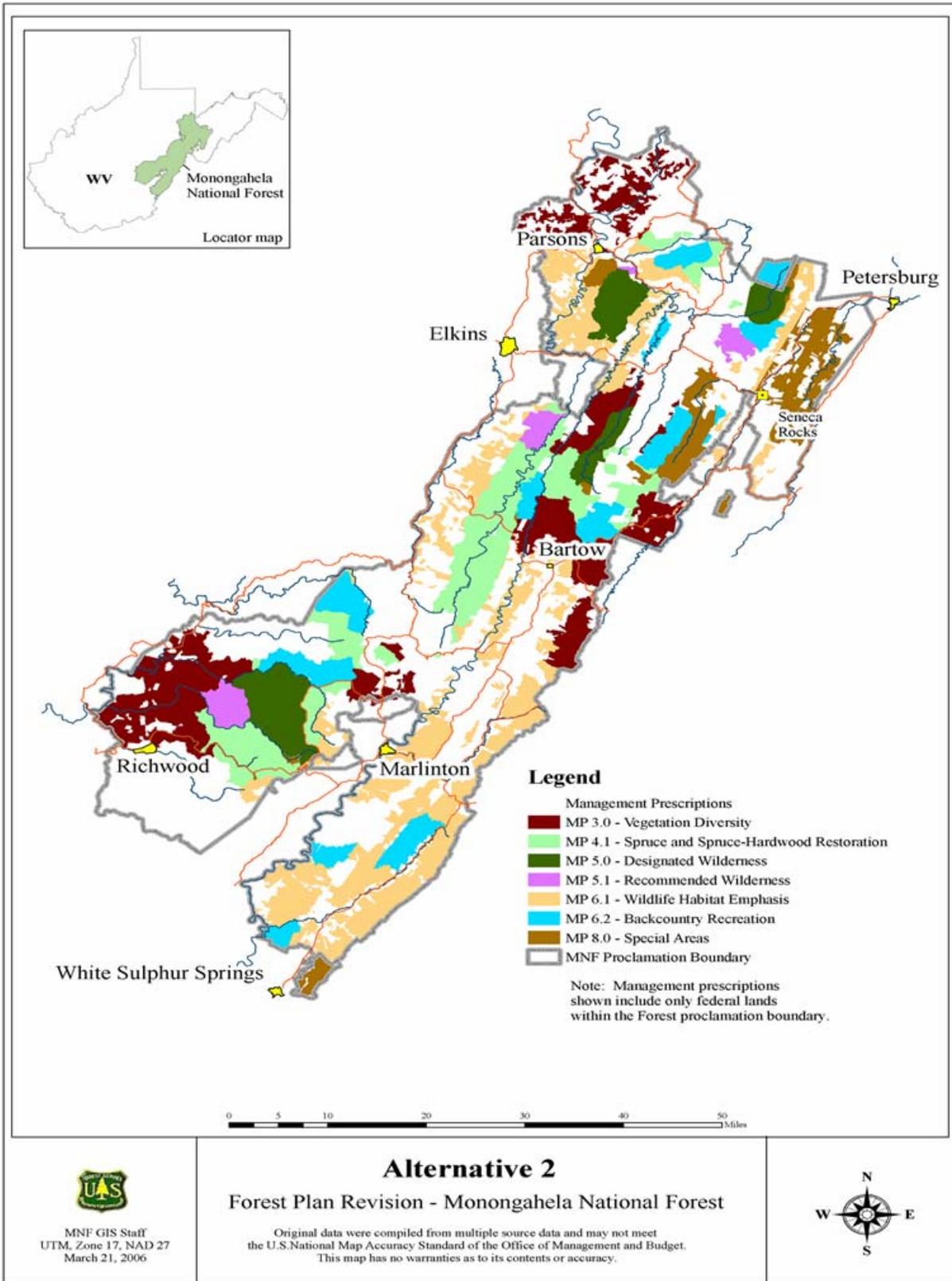
Gypsy Moth Control

Forest policy concerning gypsy moth defoliation is to treat only those areas where defoliation effects would make achieving management objectives difficult. For example, where the management objective is to provide developed recreation opportunities, much lower populations may be treated than in the general forest to reduce potential mortality that would create hazard trees and safety concerns. Typically this approach does not result in blanket treatment across the Forest. The last significant gypsy moth defoliation on the MNF lasted from 1990 through 1995. Recently, the fungus *Entomophaga maimaiga* has been maintaining low gypsy moth populations due to favorable weather conditions. Future widespread treatment would be proposed only if gypsy moth populations dramatically increased. Since 1991, only biological insecticides have been sprayed on MNF lands. These include Bt, a biological pesticide that kills moth and butterfly caterpillars in the order Lepidoptera, and Gypchek, a biological pesticide specific to gypsy moths.

Firewood Cutting

Personal firewood cutting is authorized through individual permits. Annually, 400-500 firewood permits authorize removal of 800-1000 cords of firewood, though actual cords cut are not monitored. Only dead and down trees (no standing dead trees) may be cut for firewood, which generally is gathered in autumn. Other than the standard "no cutting" areas, such as wilderness, botanical, recreation, and active timber sale sites, the MNF is open to firewood cutting. Because firewood usually is hand-carried from cutting location to vehicle, most firewood is taken from within 150 feet of open roads or from landing sites on closed timber sales.

Figure 2. Management Prescription Allocations Under the Proposed Action.



THREATENED, ENDANGERED, AND PROPOSED SPECIES

Virginia Big-eared Bat

Existing Condition and Habitat Present

The Virginia big-eared bat was listed as endangered on December 31, 1979. A USFWS Recovery Plan was signed May 8, 1984. The subspecies *C. t. virginianus* is a year-round cave obligate species occupying a very limited geographic range in the central Appalachians. In the mid 1990's, the West Virginia/North Carolina populations numbered more than 13,000 bats. The total population in 1997 was less than twenty thousand (NatureServe 2005). Five West Virginia colony sites have been designated as "critical habitat" (Federal Register 1979, USFWS 1984). They are shown in Table 2, below. Numerous other caves and abandoned mines in West Virginia have records of hibernating or summering Virginia big-eared bats, with numbers ranging from a single bat to over 1,000, although very few host more than 50 individuals.

Table 2. Critical Habitat for the Virginia Big-eared Bat in West Virginia.

Cave	Ownership	Cave Use	Protection
Cave Hollow (also known as Cave Hollow/Arbogast)	NFS lands	Maternity, Hibernaculum	Gated and fenced
Cave Mountain	NFS lands	Maternity, Hibernaculum	Gated
Hellhole Cave	Private but within Forest boundary	Hibernaculum	Fenced
Hoffman School	State and within 6 miles outside Forest boundary	Maternity, Hibernaculum	Gated
Sinnit/Thorn Cave	Private and more than 6 miles outside Forest boundary	Maternity, Hibernaculum	Gated

The WVDNR monitors 10 summer Virginia big-eared bat maternity colonies, many of which have been censused annually since 1983. Two known bachelor colonies are not monitored on an annual basis. The numbers from the summer censuses have shown a generally increasing trend over time, with the overall population trending more toward stability over the last decade (see data in Stihler and Wallace 2005). The initial survey in 1983 recorded 3,213 adult Virginia big-eared bats from eight caves. The most recently reported survey in 2005 recorded 5,990 bats from 10 caves. The highest number recorded in any survey was 6,416 in 1999 (Stihler and Wallace 2005).

Virginia big-eared bats are not migratory; however, they may move among different caves and mines during the summer and fall. The longest recorded movement is 40 miles (Barbour and Davis 1969). They begin to return to winter hibernacula in September, but continue to feed during warm evenings. By December, they return to hibernation.

Male and female Virginia big-eared bats winter hibernate singly or in mixed clusters within caves or mines. In spring, females form smaller maternity colonies. Males move to different cave areas and may form bachelor colonies or remain solitary. Nocturnal activities in maternity colonies vary as the maternity season progresses. During May and most of June, when females are pregnant, the colony remains outside the cave most of the night; however, birth takes place within caves. After birth in late June and July, the

females' nightly emergent behavior depends on the needs of their young. When the young are weaned in August, nursery colonies disperse.

Virginia big-eared bats feed predominantly on moths, but also on beetles, true flies, mosquitoes, bees, wasps, and ants (USDA Forest Service 2001). Virginia big-eared bats generally forage near their summer caves. Virginia big-eared bats have been documented foraging up to 6 miles from cave entrances (Stihler 1995), and foraging areas may include lightly grazed pastures, fields, and forest edges.

Use of different foraging habitats among Virginia big-eared bat populations in different locations appears to be a response to different habitat availabilities and demonstrates the species' flexibility to local conditions (Adam et al. 1994). Geographically isolated Virginia big-eared bat populations have been observed using different foraging habitats (Dalton et al. 1989, Adam et al. 1994, Buford and Lacki 1995). In Virginia, the bats have been documented foraging over open pastures, corn and alfalfa fields, and around tree crowns (Dalton et al. 1989), while Virginia big-eared bats in a forested landscape in Kentucky have been observed foraging in forested habitats.

Habitat within the 6-mile-radius foraging areas around West Virginia hibernacula and summer colonies is very diverse. The majority of the foraging areas are not on National Forest land, but rather private agricultural fields. Limited radio-tracking data from West Virginia have documented female Virginia big-eared bats foraging over hay fields, forests, old fields, and riparian corridors (Stihler 1994a). Most activity has been observed in a mosaic of these habitats rather than large areas of one habitat type. Herbaceous vegetative structure may be an important foraging habitat component.

Habitat and Populations on the MNF - Important habitat for the Virginia big-eared bat on the MNF consists of identified summer colony sites, hibernation sites, and foraging areas (6 mile radius from hibernacula and summer colonies). Under the 1986 plan as amended, hibernacula and summer colonies are managed through Forest Plan direction for Opportunity Area 837.

Twenty-two caves with Virginia big-eared bat records lie within the MNF proclamation boundary. Six of these caves harbor concentrations of dozens to hundreds or thousands of individuals during the winter, summer, or both. The remaining caves typically harbor a few bats or are based on old records of a few individuals. Of the 22 occupied caves within the proclamation boundary, eight are located on NFS lands. Three of these eight (Cave Hollow/Arbogast, Cave Mountain, and Peacock) typically harbor major concentrations of dozens to over a thousand individuals. These three caves are discussed in greater detail below. In addition to the 22 occupied caves in the proclamation boundary, 14 caves with Virginia big-eared bat records lie within 6 miles outside the proclamation boundary. Table 3 summarizes the 36 Virginia big-eared bat caves that are within the proclamation boundary or within 6 miles outside the boundary.

Table 3. Virginia big-eared bat hibernacula within the MNF proclamation boundary or within 6 miles outside the boundary.

Cave Name	County	Major or Minor ¹	Location	Colony Type	Gated or Fenced
Cave Hollow/Arbogast	Tucker	major	NFS land	maternity and hibernaculum	yes
Peacock Cave	Grant	major	NFS land	maternity and hibernaculum	no
Cave Mountain Cave	Pendleton	major	NFS land	maternity and hibernaculum	yes

Cave Name	County	Major or Minor ¹	Location	Colony Type	Gated or Fenced
Big Springs Cave	Tucker	minor	NFS land	hibernaculum	yes
Bowden Cave	Randolph	minor	NFS land	hibernaculum	no ²
Harper Trail Cave	Randolph	minor	NFS land	hibernaculum	no
Mill Run Cave number 1	Pendleton	minor	NFS land	unknown	no
Mill Run Cave number 2	Pendleton	minor	NFS land	unknown	no
Hellhole Cave	Pendleton	major	within proclamation boundary, not NFS land	hibernaculum and bachelor	yes
Schoolhouse Cave	Pendleton	major	within proclamation boundary, not NFS land	maternity and hibernaculum	yes
Mystic Cave	Pendleton	major	within proclamation boundary, not NFS land	maternity	no
Acorn Cave	Tucker	minor	within proclamation boundary, not NFS land	unknown	no
Izaak Walton Cave	Randolph	minor	within proclamation boundary, not NFS land	hibernaculum	no
Stewart Run Cave	Randolph	minor	within proclamation boundary, not NFS land	hibernaculum	no
Sinks of Gandy	Randolph	minor	within proclamation boundary, not NFS land	hibernaculum	no
Spring Cave	Randolph	minor	within proclamation boundary, not NFS land	hibernaculum	no
Alpena Cave number 1	Randolph	minor	within proclamation boundary, not NFS land	unknown	no
Alpena Cave number 2	Randolph	minor	within proclamation boundary, not NFS land	unknown	no
Aqua-Terra Cave	Randolph	minor	within proclamation boundary, not NFS land	hibernaculum	no
Cedar Hill Cave	Grant	minor	within proclamation boundary, not NFS land	unknown	no
Smoke Hole Cave	Pendleton	minor	within proclamation boundary, not NFS land	unknown	no
Mill Run Cave	Tucker	minor	within proclamation boundary, not NFS land	unknown	no
Warner's Cave	Pendleton	minor	within proclamation boundary, not NFS land	unknown	no
Minor Rexrode Cave	Pendleton	major	within 6 miles outside proclamation boundary	bachelor and hibernaculum	yes
Hoffman School Cave	Pendleton	major	within 6 miles outside proclamation boundary	maternity and hibernaculum	yes
Lambert Cave	Pendleton	major	within 6 miles outside proclamation boundary	maternity	yes
Mill Run Cave	Pendleton	major	within 6 miles outside proclamation boundary	maternity and bachelor	no
Elkhorn Mountain Cave	Grant	major	within 6 miles outside proclamation boundary	bachelor	no
Trout Cave	Pendleton	minor	within 6 miles outside proclamation boundary	hibernaculum	no
New Trout Cave	Pendleton	minor	within 6 miles outside proclamation boundary	hibernaculum	no

Cave Name	County	Major or Minor ¹	Location	Colony Type	Gated or Fenced
Gale Warner's Cave	Pendleton	minor	within 6 miles outside proclamation boundary	maternity (historic)	no
Flute Cave	Pendleton	minor	within 6 miles outside proclamation boundary	autumn transition	no
Brook Stemple Cave	Preston	minor	within 6 miles outside proclamation boundary	unknown	no
Keys Cave	Pendleton	minor	within 6 miles outside proclamation boundary	hibernaculum	no
Rexrode Cave	Pendleton	minor	within 6 miles outside proclamation boundary	unknown	no
Seneca Caverns	Pendleton	minor	within 6 miles outside proclamation boundary	unknown	no
Sites Cave	Pendleton	minor	within 6 miles outside proclamation boundary	unknown	no

¹Major hibernacula typically host dozens, hundreds, or thousands of bats, while minor hibernacula host very few bats in most years.

²Part of the main passage of Bowden Cave is blocked by a safety barricade, but the part of the cave that typically hosts Virginia big-eared bats is not gated or fenced.

Cave Hollow/Arbogast Cave is both a hibernaculum and maternity site and is closed to public entry year-round. The number of Virginia big-eared bats recorded during summer colony censuses in Cave Hollow/Arbogast has varied from a high of 1,137 in 1988 to a low of 286 in 1989 (Figure 3). The sharp drop between 1988 and 1989 was caused by vandalism. The 2005 census recorded 648 individuals, which is approximately 11 percent of all individuals recorded in all of the surveyed West Virginia maternity colonies. The segment of the population in this cave partially recovered from the 1989 population decline until the mid 1990s; since then it has fluctuated between about 450 and 700 individuals.

Cave Mountain Cave is used as a maternity colony and minor hibernaculum and is closed to the public from April through September. Summer colony census numbers have ranged from a high of 931 in 1989 to a low of 471 in 2000 (Figure 3). The 2005 census recorded 510 individuals, which accounts for about 9 percent of all individuals in all of the surveyed West Virginia maternity colonies. The segment of the population in this cave showed a generally declining trend from 1989 to 2000.

Peacock Cave is used as a hibernaculum and maternity site. This cave is signed for year-round closure. Summer counts at Peacock Cave have ranged from a low of 160 individuals in 1983 to a high of 1,038 individuals in 2005 (Figure 3). The 2005 count represents approximately 17 percent of all individuals censused in all of the West Virginia maternity colonies. Census numbers in Peacock Cave have shown a generally increasing trend since surveys began in 1983.

Since 1992, which was the first year in which all of the currently known major summer colonies were surveyed, the three major caves on NFS land have accounted for approximately 30 to 40 percent of the total number of individuals in the surveyed West Virginia maternity colonies. The total number of individuals in the three caves has generally exhibited a stable to slightly upward trend since 1989 (Figure 3), reflecting the increasing numbers in Cave Hollow/Arbogast and Peacock Cave and the decreasing numbers in Cave Mountain Cave.

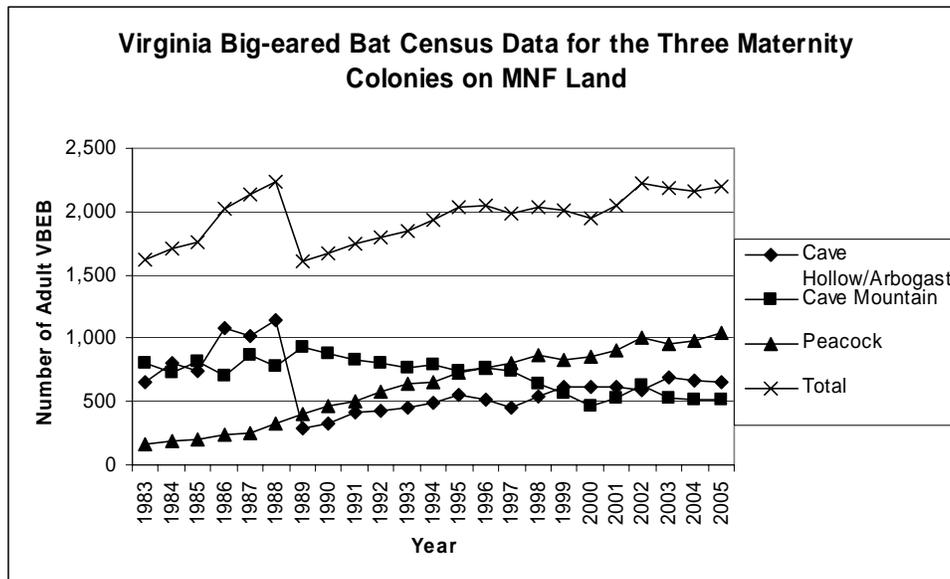
Based on the 6-mile radius for foraging, there are an estimated 604,000 available foraging acres within the MNF proclamation boundary. Foraging areas within the proclamation boundary are very diverse. A sizeable minority of the land within foraging areas is private agricultural land. Other non-NFS land uses within the foraging areas include timber harvests, strip mining, limestone/rock quarries, State Park, and National Wildlife Refuge land. Characterization of habitat use is difficult due to the paucity of telemetry data and the fact that much of the available habitat is on private land, which has no stand data. NFS land contains approximately 324,000 acres of Virginia big-eared bat foraging area. Limited telemetry data from NFS land recorded Virginia big-eared bats foraging in mixed oak and pine-oak stands (Stihler 1994a).

Threats - Cave dwelling bats are particularly at risk due to disturbances within and near the cave environment (USFWS 1984). Disturbance by humans or natural forces during hibernation and maternity rearing can have devastating effects on bat populations. Removal of buildings that are being used as roosting or resting areas may also be a threat.

In addition to direct effects to roosting individuals, Virginia big-eared bats may be indirectly vulnerable to activities that affect foraging. Herbaceous foraging habitats such as old fields, hay fields, and pastures that are not maintained may be degraded or eliminated by reforestation. Insecticides, particularly those used for gypsy moth, may adversely affect the food supply (Sample and Whitmore 1993).

Wind turbines used to generate electric power are a relatively new threat to bats in West Virginia. Although no mortality of endangered bats has been documented, wind turbines on private land in Tucker County were estimated to have killed over 2,000 bats of various species during the period 4 April through 11 November 2003 (Curry and Kerlinger, LLC 2004). During a six-week search period in the summer of 2004, the same turbines were estimated to have killed between 1,364 and 1,980 bats (Arnett et al. 2005). These windmills are not located near any Virginia big-eared bat hibernacula. It is reasonable to assume that Virginia big-eared bats could be killed if wind turbines were to be constructed closer to hibernacula.

Figure 3.



Conservation Measures in the Revised Plan

The revised plan contains the following measures that protect the Virginia big-eared bat and contribute to its recovery:

- Within 6 miles of hibernacula, maternity colonies, or bachelor colonies, it is the goal of the MNF to create or maintain a diversity of open, herbaceous habitats where consistent with MP emphasis.
- Buildings within 6 miles of hibernacula, maternity colonies, or bachelor colonies must be evaluated for their potential to serve as roosting habitat prior to any construction, reconstruction, demolition, etc. if such work is to be conducted outside the hibernation period.
- Most types of management activities are prohibited within 200 feet of hibernacula, maternity colonies, and bachelor colonies except those conducted for bat habitat enhancement, safety, or research.
- Seismic exploration and use of explosives would not be allowed within 200 feet of hibernacula, maternity colonies, and bachelor colonies unless analysis can show that such activities would not adversely affect Virginia big-eared bat populations or habitat.
- Surface occupancy for federal mineral operations is not allowed within 200 feet of hibernacula, maternity colonies, or bachelor colonies.
- Caves and mines used as major hibernacula, maternity colonies, or bachelor colonies are closed to public entry during the season of use by Virginia big-eared bats.
- High-quality riparian foraging habitat is protected through Forest-wide direction for stream channel management corridors.

In the revised plan, Virginia big-eared bat sites are managed through Forest-wide direction rather than OA 837, but the level of protection and management emphasis remain similar to OA 837. See the sections on Threatened, Endangered, and Proposed species and Soil and Water Resources in Chapter II of the revised Forest Plan for detailed direction.

Direct and Indirect Effects

Effects from Mineral Operations - There are currently 44 existing gas well sites within Virginia big-eared bat foraging areas. Gas well sites generally add to landscape diversity and provide potential Virginia big-eared bat foraging habitat, although they could degrade habitat if they are constructed in existing herbaceous openings. It is not possible to predict with any accuracy the amount of future gas development under the revised Forest Plan, although the amount is expected to be within the limits projected by the 1991 Environmental Assessment for oil and gas development (USDA Forest Service 1991). The revised Forest Plan provides broad direction on where and how leasing and development of federal gas can occur, but does not make specific decisions about the location, amount, or timing of gas development. The amount of surface modification associated with future gas development is not expected to be extensive (see *Mineral Resources* section in Chapter 3 of the EIS).

Development of other minerals is rare on the Forest, but could occur in the future. Effects from minerals other than gas developments are difficult to predict because they vary depending on what is being developed, recovery methods, surface disturbance intensity and reclamation.

For these reasons, it is expected that Virginia big-eared bat foraging would not be adversely affected by existing or future mineral activities, although quality foraging areas may increase slightly due to creation of new herbaceous openings. Because the total area to be affected by development of federal minerals is expected to be small, effects on foraging habitat are likely to be negligible.

None of the well sites are within the 200-foot radius of Virginia big-eared bat hibernacula or summer sites; however, there is one pipeline within 200 feet of a cave entrance. Under the revised Forest Plan, surface activity associated with development of federal minerals would not be allowed within 200 feet of hibernacula, maternity, or bachelor colony sites. Direction in the revised Forest Plan would not allow seismic exploration or use of explosives within the 200-foot buffers unless analysis could show that such activity would not cause an adverse effect (see conservation measures above and direction in the Threatened, Endangered, and Proposed Species section of revised Forest Plan Chapter II). Therefore, Virginia big-eared bat hibernacula, maternity, and bachelor colony sites are unlikely to be adversely affected by future federal mineral activity.

Development of privately-owned minerals beneath NFS lands is controlled by the deed. While the MNF would attempt to coordinate with private mineral owners and the USFWS to avoid impacts, the MNF generally has little authority over private mineral operations. Depending on the terms of the mineral severance deed, the MNF may have some discretion over the location of surface occupancy associated with private mineral developments. In such cases the MNF would encourage locations that avoid adverse impacts to Virginia big-eared bat sites. The federal action would be limited to the MNF's authority, which may not include the effects of the mineral development itself. Therefore, any effects of private mineral development beyond those over which the deed allows MNF discretion are not analyzed as part of this federal action. ESA compliance for those effects would be the responsibility of the private mineral developer.

Effects from Range Activities - There are currently 4,315 Forest Service range allotment acres within available Virginia big-eared bat foraging area. Range allotments provide habitat diversity and contribute to the mosaic of land types within forage areas. Development of new range allotments is expected to be limited to newly acquired land that is already pasture or hay land. Therefore, Virginia big-eared bat foraging would not be affected by continued range management activities, as activities would not alter habitat or foraging opportunities.

There are no known hibernacula or summer colony sites within existing Forest range allotments. There may be instances where abandoned buildings located within Forest Service range allotments are used during the summer by Virginia big-eared bats; however, grazing activities within those allotments should not affect Virginia big-eared bat use. Prior to taking actions on buildings within 6 miles of hibernacula or summer colonies, Forest-wide direction requires that the buildings be evaluated to determine whether they are being used by Virginia big-eared bats, and negative effects must be avoided. Therefore, range management activities are not expected to affect roosting or hibernating Virginia big-eared bats.

Effects from Fire-related Activities – The location and extent of wildfire suppression activities are difficult to predict due to the unpredictable nature of wildfire. Fire suppression along edge and within brushy habitats allows for continued succession, which could eventually reduce available edge and habitat diversity. Wildfire suppression in forested areas may deter formation of new edge habitat and openings. These potential negative effects would likely be more than compensated for by the use of prescribed fire, as described below. Currently wildfire and fire suppression activities occur at fairly low levels on the Forest, and they are not expected to increase dramatically over the short term.

Prescribed burning is allowed within Virginia big-eared bat foraging areas based on revised Forest Plan

direction. Site-specific burn plans would be completed at the project level for each burn, and these plans must consider potential effects on TEP species. It is believed that burn plans could be designed to avoid adverse effects on Virginia big-eared bats. Past prescribed burns have been used to maintain openings and edge habitats that otherwise could revert to forest. Repetitive burning may result in loss of mid and understory species, but may promote herbaceous species. An expanded prescribed fire program would create more open stands with an herbaceous component in the understory, which could improve Virginia big-eared bat foraging areas.

Estimates of potential improvement to Virginia big-eared bat habitat through prescribed fire are based on Forest-wide goals and objectives in the revised Forest Plan. Forest-wide prescribed fire objectives focus on Fire Regime Condition Class (FRCC) I, 3 and FRCC III, 2. These condition classes represent fire-adapted communities that are at risk of losing ecosystem components because of fire suppression. Within these high priority areas, objectives call for applying prescribed fire to 5 to 15 percent of the acreage within the first decade of the planning horizon. Within the 324,000 acres of foraging habitat on NFS land within 6 miles of Virginia big-eared bat caves, an estimated 67,000 acres are in FRCC I, 3 or FRCC III, 2, and are also in areas where prescribed fire is most likely to be applied (MPs 3.0, 6.1, or 8.1). If prescribed fire is applied to the same proportion of high priority land in foraging habitat as in high priority areas on the whole Forest, the revised Forest Plan's objectives for prescribed fire could result in the treatment of about 3,400 to 10,000 acres of Virginia big-eared bat foraging habitat during the first decade of the planning horizon. This amounts to approximately 1 to 3 percent of all foraging habitat on NFS land within 6 miles of Virginia big-eared bat caves. This estimate assumes that FRCC I, 3 and III, 2 areas within foraging habitat would be treated with the same priority level as similar areas outside of foraging habitat. Because of goals and objectives to enhance habitat for endangered species, areas within foraging habitat could have an even higher priority than other FRCC I, 3 and III, 2 areas, which could result in a larger amount of habitat treated. Conversely, budget and staffing limitations could result in smaller amounts of habitat treated.

Under revised Forest Plan direction, vegetation management, which could include prescribed burning, would only occur within 200 feet of hibernacula or maternity/summer colonies to maintain or enhance bat habitat, or for public safety or research purposes. Prescribed fire within 200 feet of hibernacula and maternity/summer colonies is considered unlikely because of the risk of smoke entering the cave, but the plan does not specifically prohibit it. If prescribed fire were to be used, a burn plan would be required to ensure protection or maintenance of TEP species and habitat. Naturally occurring wildfire is unpredictable; however, fire suppression would be used to extinguish fires that are close enough to known maternity/summer colonies or hibernacula for smoke to enter the cave. Negligible effects to Virginia big-eared bat hibernacula and maternity/summer colony sites from fire-related activities are expected due to the protections described above.

Effects from Road-related Activities - Current Forest roads provide edge habitat and travel corridors used by many species, including bats. New road construction or reconstruction would likely increase these beneficial effects. Road decommissioning would have the opposite effect as corridors fill in with trees over time, unless decommissioned roads are maintained as linear wildlife openings. It is possible that Virginia big-eared bats could collide with vehicles traveling during the night. However, the majority of night-time vehicular use within Virginia big-eared bat foraging areas would occur on state or county roads rather than Forest roads.

Future road construction and decommissioning levels are difficult to predict for a number of reasons (see *Road Transportation System* section in Chapter 3 of the EIS). Also, it is expected that the overall amount of roads added to the transportation system would only be a very small portion of the 324,000 available foraging acres on the Forest due to such factors as MP road density constraints, anticipated incidental take

restrictions for the Indiana bat, site-specific resource concerns, and a revised Forest Plan goal to determine the minimum transportation system necessary to achieve access management objectives.

New road or trail development is prohibited within 200 feet of Virginia big-eared bat hibernacula and summer colonies. Currently there are no Forest Service system roads or trails within 200 feet of any Virginia big-eared bat maternity/summer colony sites or hibernacula. Unauthorized user-created trails may lead to some caves; however, they are not part of the transportation or trail system and any effects caused by these trails are not considered to be effects caused by implementation of the revised Forest Plan. Due to the prohibition on road and trail construction within 200 feet of these areas, there would be no effects to Virginia big-eared bat hibernacula or maternity/summer colony sites.

Effects from Recreation Activities – Dispersed recreation opportunities occur within foraging areas; however, these activities would not measurably affect Virginia big-eared bat foraging activity as most recreation occurs during daylight hours. There are several developed recreation areas within Virginia big-eared bat foraging areas, ranging from day use picnic areas to the Seneca Rocks Discovery Center. Existing facility and trail maintenance would tend to maintain current conditions and, therefore, would not measurably affect Virginia big-eared bat foraging habitat. No large-scale facility development or new trail development is planned for the foreseeable future. Although facilities are allowed in many areas, any development likely would cover a minor portion of the total Forest-wide foraging area.

Sport caving (spelunking) is fairly popular on the MNF and will likely continue in the future. Revised Forest Plan direction requires that major hibernacula be closed to public entry from September 1 to May 15. Minor hibernacula can remain open to public use if the MNF, USFWS, and WVDNR agree that such use would be extremely unlikely to cause harm or mortality. Based on this direction, Cave Mountain Cave, Bowden Cave, Harper Trail Cave, and Mill Run Cave numbers 1 and 2 would be likely to remain open during the hibernation season. Big Springs cave also is a minor hibernaculum for Virginia big-eared bats, but it currently is closed during the hibernation season because it serves as a major hibernaculum for Indiana bats. All caves used by Virginia big-eared bats during the maternity season are closed to public entry from April 1 to September 15. Given these Forest-wide standards, recreation is unlikely to adversely affect Virginia big-eared bats in hibernacula or maternity sites.

Effects from Watershed and Aquatic Habitat Restoration Activities – Soil, water, riparian, and aquatic restoration within foraging areas and within 200 feet of hibernacula and maternity/summer colony sites are not explicitly limited by the revised Forest Plan. If such activities involve vegetation management, they may occur within 200 feet of hibernacula and maternity/summer colony sites only if conducted for maintenance or improvement of bat habitat, public safety, or research. Restoration activities tend to occur in localized areas on a very small scale, and would therefore not measurably affect available Virginia big-eared bat foraging habitat, hibernacula, maternity or summer colony sites across the Forest.

Effects from Salvage Activities – Timber salvage would occur only after areas have already been damaged or altered by natural disturbances. Because Virginia big-eared bats are not known to use trees for day roosts or maternity sites, tree removal would have negligible negative effects on habitat or individuals, and could have a small positive effect by opening up potential foraging areas. Activities would not occur within 200 feet of hibernacula or maternity/summer colony sites unless they are conducted for maintenance or improvement of bat habitat, public safety, or research. Therefore, salvage activities would have no adverse effect on hibernacula and maternity/summer colony sites.

Effects from Wildlife Habitat Management - Wildlife habitat management may add to diversity within Virginia big-eared bat foraging habitat depending on the activity planned. Wildlife opening creation and maintenance would help provide edge habitat and herbaceous foraging habitat. If MP objectives for

maintained openings are met, 1,000 to 4,000 acres of new wildlife openings would be created over the next decade. Additional openings likely would be created in later decades of the planning horizon as the Forest strives to meet MP 3.0 and 6.1 desired conditions of 3 to 8 percent of the landscape in herbaceous openings. As part of the MNF's ongoing strategy for TEP species management, these openings may include areas created or maintained specifically for the benefit of Virginia big-eared bats.

Other localized wildlife habitat management activities would likely have little or no effect unless they were specifically designed to benefit Virginia big-eared bat foraging habitat. Any habitat management activities involving vegetation manipulation would not occur within 200 feet of hibernacula or maternity/summer colony sites unless they are conducted for maintenance or improvement of bat habitat, public safety, or research. Therefore, wildlife habitat management is expected to have no negative effects, and possibly some positive effects, on hibernacula and maternity/summer colonies.

Effects from Timber Harvest Activities – As noted above, tree removal and associated road activities are not major concerns for this species. Virginia big-eared bats use caves year-round, although standing timber may be used for night roosting. Because the bats return to caves during the day, or occasionally day roost under bridges or in man-made structures, there would be little or no direct effect on Virginia big-eared bat individuals from timber harvesting activities. Activities would not occur within 200 feet of hibernacula or maternity/summer colony sites unless they are conducted for maintenance or improvement of bat habitat, public safety, or research. Therefore, timber harvest activities are not expected to have any negative effects on hibernacula and maternity/summer colonies.

Timber harvest could affect Virginia big-eared bat foraging habitat due to its ability to create openings and edge, particularly through even-aged regeneration harvest. Because Virginia big-eared bats forage in a wide variety of open and forested habitats, even-aged regeneration harvest over a modest portion of the landscape is not believed to have measurable negative effects on habitat. However, timber harvest has not been shown to be beneficial.

Under both the current Forest Plan and the revised Forest Plan, even-aged regeneration harvest would be most likely to occur on lands that are in the suitable timber base. In the revised Forest Plan, the suitable timber base generally is limited to MPs 3.0, 6.1, and minor portions of MP 4.1. Within these MPs, the suitable timber base is further limited by resource protection measures for West Virginia northern flying squirrel habitat, Indiana bat primary range, stream channel management corridors, very high scenic integrity areas, etc. Thinning also would occur in the suitable timber base, but could also occur in Indiana bat primary range as part of habitat enhancement efforts for the Indiana bat. Because Indiana bats and Virginia big-eared bats use many of the same caves, Indiana bat primary range overlaps a large portion of Virginia big-eared bat foraging habitat. Because of direction in both the current and revised Forest Plan to emphasize Indiana bat habitat enhancement in these areas, even-aged regeneration harvest is likely to be rare in these overlap areas for the foreseeable future.

Table 4 displays the estimated potential amount of silvicultural treatments in Virginia big-eared bat foraging habitat for the first decade of the planning horizon. These estimates are extrapolations based on Forest Plan objectives for the total amount of such treatments on similar lands Forest-wide, and should be interpreted with caution. If conditions on lands within Virginia big-eared bat foraging habitat differ from conditions on similar lands Forest-wide, different amounts of silvicultural treatments likely would result. Also, these estimates represent the amount of silvicultural treatment that would result from achieving the objectives in the revised Forest Plan. Actual treatment amounts may be lower because of budget and staffing limitations. This exercise shows that the revised Forest Plan makes about 33 percent of Virginia big-eared bat foraging habitat available for some kind of silvicultural treatment. The revised plan would thin 1.0 to 2.1 percent of all Virginia big-eared bat foraging habitat during the first decade, and would conduct regeneration harvesting on 0.8 to 1.7 percent during the first decade. Thus regeneration

harvesting has the potential to change a very small proportion of the mature forest in Virginia big-eared bat foraging habitat to seedling/sapling forest and associated edge.

Table 4. Estimated potential acreage of silvicultural treatments during the first decade of the planning horizon in Virginia big-eared bat foraging habitat (6-mile radius circles around occupied caves).

	Acres	
Total amount of Virginia big-eared bat foraging habitat	324,000	
Total amount available for silvicultural treatment ¹	107,000	
	Low Estimate	High Estimate
Potential thinning ²	3,100	6,900
Potential even-aged regeneration harvest ³	2,700	5,500
Total potential silvicultural treatment	5,800	12,400

¹Includes all suitable timberland and portions of Indiana bat primary range within Virginia big-eared bat foraging habitat where silvicultural habitat enhancement treatments are not precluded by other factors.

²For Virginia big-eared bat foraging habitat that is also Indiana bat primary range, potential thinning harvest was estimated by extrapolating the Forest-wide proportion of primary range where silvicultural treatments are projected in the foreseeable future. Outside of primary range, thinning was estimated by extrapolating the Forest-wide proportion of suitable timberland that is projected to be thinned during the first decade of the planning horizon.

³Estimated by extrapolating the Forest-wide proportion of suitable timberland that is projected to be harvested during the first decade of the planning horizon.

Effects From Gypsy Moth Control – Gypsy moth spraying occurs during the day when Virginia big-eared bats are in caves or under cover in temporary daytime roosts; therefore the probability that a bat would be sprayed is very low. Consequently, gypsy moth control spraying will have no direct effects on Virginia big-eared bats.

Indirect negative effects may result if pesticides such as Bt or Dimilin are used because these pesticides kill moths indiscriminately, thereby reducing species richness of moths, which are the major food source for Virginia big-eared bats. If spraying is necessary within 6 miles of maternity caves, Gypchek will be the preferred method. Spraying beyond 6 miles from maternity caves will have very little effect. Gypchek does not reduce species richness of moths and, therefore, will not indirectly affect Virginia big-eared bats.

Effects From Firewood Cutting – Firewood permits are issued for dead and downed trees or tree tops/slash from closed timber harvest areas and along roads. Virginia big-eared bats do not use dead and downed trees or slash for roosting. Therefore, firewood cutting on the MNF will not directly or indirectly affect Virginia big-eared bats.

Cumulative Effects

Effects to Habitat – The majority of Virginia big-eared bat foraging area is private land that is a mixture of habitats consisting of forests, pastures, and other agricultural uses. Data contained in the *Census of Agriculture* (USDA 2004, 1999) suggest that there has been little recent change in the acreage of agricultural land in the counties that contain the MNF. For private forest land, data from the Forest Service's Forest Inventory and Analysis database suggest a slightly increasing trend in sawtimber acreage and a slightly decreasing trend in poletimber and seedling sapling acreage (data from FIA website). Combined with the projected small increase in herbaceous openings and the projected small increase in

seedling/sapling forest on NFS land, no major cumulative change in foraging habitat is expected in the foreseeable future.

Vandalism and cave visitation has resulted in destruction of habitat and disturbance to individuals for many bat colonies (USFWS 1984). Habitat reduction may also occur after natural disasters (flooding, cave subsidence), cave commercialization, and alterations of airflow into caves due to poorly designed and installed cave gates or naturally caused blockages in cave passages. Increased popularity of spelunking on private land could create a shift to increased use of MNF caves. Increased recreational use of MNF caves could contribute to the cumulative effects of alterations to cave habitat, though the potential extent and severity of such alteration is difficult to predict. However, hibernacula and summer colonies on NFS lands are protected by closure orders, Forest Plan direction, and the Cave Resources Protection Act, so National Forest management and authorized recreational use contributions to these cumulative effects are considered extremely unlikely.

Effects to Individuals – Hibernating and summer-roosting Virginia big-eared bats, especially females with young, are at risk from human disturbance. During hibernation, disturbances can cause bats to expend fat reserves with no opportunities to replenish during the winter months. During maternity season, young are at risk if the colony is disturbed. Although important hibernacula and summer colonies are gated and closed to protect imperiled bats, gating every potential hibernaculum in the state would be logistically and legally impossible. Thus, unrestricted spelunking across West Virginia could have negative effects on Virginia big-eared bats in the future. However, direction in the revised Forest Plan prohibits public entry into major Virginia big-eared bat caves when the bats are present. Therefore, given these standards, there is little potential for authorized recreational activities on the MNF to contribute to these cumulative effects.

Historic collecting, handling, banding and counting individuals during hibernation or maternity season also have contributed to population declines over the years (USFWS 1984). Continued scientific activities, such as hibernacula/maternity surveys, mist netting, and trapping, have the potential to harm bats. The revised Forest Plan requires Forest Supervisor approval and the appropriate USFWS permits for scientific studies in caves during closed periods, and the ESA and its implementing regulations require permits and use of qualified personnel for mist netting and trapping. It is expected that such approvals and permits will make any contribution by the MNF to such cumulative effects extremely unlikely.

Several animals—including cats, owls, hawks, raccoons, skunks and snakes—are known to prey on bats. Many such small and medium-sized predators are known to frequent edge habitats such as those created by agriculture or forest management activities. However, direction in the revised Forest Plan prohibits most vegetation management within 200 feet of Virginia big-eared bat cave entrances, which is expected to make any MNF contribution to such effects extremely unlikely. Gates and barriers used to prevent human access to caves can also contribute to predation by causing bats to slow down and circle prior to entering the cave. Methods have been devised to avoid this problem, such as moving gates a short distance inside the cave entrance so the circling occurs in an area that is too dark to allow successful predation. Therefore, any new gates or barriers are not expected to make a measurable contribution to the cumulative effects of predation.

Currently there are three private quarries operating near occupied Virginia big-eared bat caves. Expansions of these quarries, new quarries, or other private mineral developments have the potential to adversely affect Virginia big-eared bat individuals or their habitat. Direction in the revised Forest Plan prohibits surface occupancy for federal mineral operations within 200 feet of Virginia big-eared bat caves. Plan direction also limits seismic exploration and use of explosives to those areas where such activities will not adversely affect Virginia big-eared bats or their cave habitat. This plan direction is

expected to eliminate the MNF's potential to contribute to the cumulative effects of mineral exploration and development.

Wind power development on private land could result in harm or mortality to Virginia big-eared bats. The existing threat is believed to be low because the only currently operating wind generation facility in the vicinity of the MNF is not located near any Virginia big-eared bat hibernacula or summer colonies. However, a proposed facility outside the MNF in Pendleton County falls within the 6-mile foraging habitat circles associated with several Virginia big-eared bat caves, including Minor Rexrode Cave, which serves as a bachelor colony and hibernaculum for hundreds of Virginia big-eared bats. Other permitted (but not yet constructed) wind power facilities in Grant County would not fall within any of the foraging habitat circles that overlap the MNF proclamation boundary. There have been no formal proposals for wind energy development on MNF land, so foreseeable MNF activities would not contribute to cumulative harm and mortality due to wind power development. The revised Forest Plan does not specifically restrict wind power, although plan direction for special uses would apply to any proposed wind power development on MNF land. Because there is no existing or proposed wind energy development on the MNF, and because the revised Forest Plan contains no goals or objectives for wind energy, any attempt to analyze the effects at the programmatic level would be speculative. Therefore, any future wind energy proposals on the MNF that may affect listed species would not be covered by the programmatic consultation on the revised Forest Plan and would need to undergo full ESA Section 7 consultation.

Determination of Effect

Most of the management activities discussed above have some potential to affect the Virginia big-eared bat. Activities that involve tree felling and wildlife habitat management have the potential to affect foraging habitat, but these activities create habitat diversity that is generally considered to be beneficial, or at least not detrimental, to this species. Tree felling has essentially no potential for direct effects to individuals because they generally roost in caves or structures. Other activities such as recreation, mineral exploration and development, fire management, and road management have the potential to affect habitat or individuals in hibernacula and summer colonies, but these activities are governed by Forest Plan direction that reduces the potential for adverse effects to the point that it is discountable. Therefore, for the Virginia big-eared bat, a determination of **may affect, not likely to adversely affect** is made for the implementation of the revised Forest Plan.

Most management activities will avoid designated critical habitat for the Virginia big-eared bat. However, direction in the revised Forest Plan allows some vegetation management activity for bat habitat improvement, safety, and research within the 200-foot buffer around occupied caves. Also, revised Forest Plan direction could allow mineral exploration and use of explosives in the buffer, but only if such activities can be shown to have no adverse effects. Any effects from these activities are expected to be beneficial, insignificant, or discountable. Therefore, for Virginia big-eared bat critical habitat, a determination of **may affect, not likely to adversely affect** is made for the implementation of the revised Forest Plan.

Indiana Bat

Existing Condition and Habitat Present

The Indiana bat was listed as endangered on March 11, 1967. The original 1983 Recovery Plan is under revision and has not been finalized. However, a draft of the revised version is often used to provide guidance for management activities (USFWS 1999).

Indiana bat distribution is generally associated with limestone karst in the eastern U.S. (Menzel et al. 2001). Indiana bats occupy distinct habitat types: mines and caves are used for hibernation during winter, while forested areas are used for summer foraging, roosting, and fall swarming.

Wintering colonies require very specific climatic regimes in caves or mines (Menzel et al. 2001). Habitat conditions are so specific that more than 85 percent of the range-wide populations hibernate in just 9 caves in Indiana, Kentucky and Missouri (USFWS 1999). Indiana bats hibernate in compact clusters containing males and females; however, females enter hibernation earlier in autumn than do males.

Summer foraging and maternity roosting habitat is difficult to quantify at a range-wide, regional, or local level due to variability of known maternity roost sites and lack of knowledge about landscape scale habitat characteristics. However, based on a review of range-wide data, Romme et al. (1995) constructed a habitat suitability model that suggests that optimal canopy closure for roosting ranges from 60 to 80 percent. Romme et al. (1995) further described optimal roosting habitat as having an abundance of large trees and snags (>8.7 inches DBH) and a relatively open understory. Tree structure, specifically the availability of exfoliating bark or cavities that provide roost space, is a critical characteristic for roost trees. Timber harvesting does not discourage Indiana bats from using nearby trees as roosts, and in fact may make them more attractive by allowing more warming by solar radiation (USFWS 1999). However, the disturbance during timber cutting may temporarily displace bats from nearby roosts. Indiana bats use isolated trees in openings as roost trees (Kurta et al, 1993), and they may switch between shaded and unshaded roost trees depending on weather conditions (Callahan et al. 1997; Menzel et al. 2001) and physiological requirements associated with thermal regulation. Indiana bat maternity colonies generally use both primary and alternate roost trees (Britzke et al. 2003).

Most known maternity sites have been located in forested tracts in agriculturally dominated landscapes in Missouri, Iowa, Indiana and Illinois (USFWS 1999). A small number of maternity colonies recently have been reported in heavily forested mountainous areas of western North Carolina, eastern Tennessee (Britzke et al. 2003), and West Virginia. Maternity colonies have been reported from three sites in West Virginia, one of them within the MNF proclamation boundary but on private land (USDA Forest Service 2004). Maternity activity has been suspected, but not confirmed, at one additional roost site on the MNF. Colonies generally are found under the loose bark of dead or dying trees, but roosts have been found in tree cavities (Gardner et al. 1991).

Menzel et al. (2001) suggested that foraging occurs in riparian areas, upland forests and woodlots, and over ponds. Information from limited radio telemetry work on the MNF in recent years supports this assessment of foraging habitat use. Insects are caught and consumed while the bats are flying. Prey insects include moths, beetles, flies, caddisflies, stoneflies, lacewings, and ants. Moths and beetles are the largest part of most diets.

Most studies of Indiana bat foraging habitat use have been observational in nature. The few that have tried to investigate preference and avoidance of specific habitats were subject to potential methodological biases that raise questions about the validity of the results (see studies reviewed in Menzel et al. 2001 and

USFWS 1999). Based on a review of range-wide data, Romme et al. (1995) constructed a habitat suitability model that suggests that optimal canopy closure for foraging ranges from 50 to 70 percent. However, few data are available to demonstrate a clear preference or avoidance of particular forest canopy conditions.

In addition to forest canopies, Indiana bats also are known to forage along forest edges, in early successional areas, and along strips of trees extending into more open habitat, but drinking water must be available near foraging areas (Romme et al. 1995). Large open pastures or croplands, large areas with less than 10 percent canopy cover, and stands with large, unbroken expanses of young, even-aged forests are avoided or are rarely used (Romme et al. 1995).

Indiana bats begin pre-hibernation swarming near caves as early as August, and continue swarming through October or November, depending upon local weather conditions. Swarming entails congregating around hibernacula prior to hibernation and flying into and out of cave entrances from dusk to dawn (Kiser and Elliot 1996). This is a biologically important period because during this time, bats mate and replenish fat reserves prior to hibernating (USFWS 1983).

Habitat and Populations on the MNF - Important habitats for Indiana bat on the MNF are currently recognized as four distinct areas:

- Maternity sites are evidenced by lactating females or juveniles discovered prior to August 15.
- Hibernacula are the caves or mines that are occupied by hibernating Indiana bats.
- Key areas provide mature forest habitat near hibernacula. A key area is at least 150 acres in size, and, as appropriate, includes 20 acres of older growth forest and 130 acres of mature forest located as close to the cave as possible.
- Primary range, which includes summer foraging, roosting, and fall swarming areas, is defined as all areas within 5 miles of hibernacula.

Under the 1986 plan as amended, maternity sites, hibernacula, and key areas are managed under Opportunity Area 838, whereas primary range is managed under a combination of MPs 6.3, 5.0, and 6.2.

West Virginia is within the Indiana bat's eastern maternity range, but not within its core range. Until recently, nighttime temperatures on most of the MNF were thought to be too cold to support numerous maternity colonies (Stihler pers. comm. 1999, Tolin pers. comm. 1999). Despite extensive summer surveys throughout West Virginia and the MNF, prior to summer 2003 there were no confirmed maternity colonies in the state. However, in 2003 a maternity colony was discovered in the southern part of West Virginia. This colony was confirmed again in 2004 (Chapman 2005). Also in 2004, a confirmed maternity colony was located on private land within the MNF proclamation boundary in Tucker County. That same summer, a male Indiana bat was tracked to a roost tree on the MNF in Pendleton County that contained 23 bats. Maternity activity is suspected at this site, though not confirmed because no lactating females or juveniles were captured.

Potential summer/maternity roosting and foraging habitat is widely available as the MNF is over 95 percent forested, with nearly 90 percent of the forested area being more than 60 years old. Given the average growth rates on the MNF, the stands that are over 60 years old most likely have a mean diameter in excess of the 8.7 inches needed for quality roosting habitat. Trees exhibiting roosting characteristics, such as shagbark (*Carya ovata*) and bitternut hickory (*Carya cordiformis*), red (*Quercus rubra*) and white oak (*Quercus alba*), sugar maple (*Acer saccharum*), white (*Fraxinus americana*) and green ash (*Fraxinus pennsylvanica*), and sassafras (*Sassafras albidum*), are plentiful throughout the Forest. Snag abundance currently is below optimum levels in most areas, although snags do contribute to summer roosting habitat quality. Field observations suggest most of these stands have closed or nearly closed canopies, which may be denser than is optimal for roosting and foraging. As aging continues, canopy gaps from dying

trees will become more prevalent, reducing the overall canopy cover. However, because less than 5 percent of forested acreage currently exceeds 120 years old, gap dynamics are not likely to be widespread during the first decade or two of the planning horizon.

Hibernating Indiana bats have been observed in many West Virginia caves, with numbers ranging from a single observation to populations over 11,000. The largest West Virginia population is found in Hellhole Cave in Pendleton County. This cave is designated as Priority Two “Critical Indiana Bat Habitat” (Federal Register 1976). It lies on private land within the MNF’s proclamation boundary. Over the years it has been censused, Hellhole’s wintering population has gone from 210 Indiana bats in 1984 to 11,890 in 2005.

Based on recent WVDNR surveys and data in MNF files, 15 Indiana bat hibernacula are located within the MNF proclamation boundary (Stihler et al. 2001; Stihler and Wallace 2002, 2003, 2004, 2005; USDA Forest Service unpublished data). Seven of these are major hibernacula that regularly harbor dozens to hundreds or thousands of hibernating Indiana bats. The other eight typically host a few individuals or are based on old records of a few individuals. Six of the 15 hibernacula within the proclamation boundary have all or most of their entrances on NFS lands. Of these six, two caves (Big Springs and Cave Hollow/Arbogast) regularly host dozens to hundreds of Indiana bats. Eleven additional hibernacula lie within 5 miles outside the proclamation boundary. At the programmatic level, key areas have been defined around hibernacula within and near the proclamation boundary, although additional analysis likely will be necessary to refine these at the site-specific level. Table 5 presents an information summary for the hibernacula that lie within the proclamation boundary or within 5 miles outside of the boundary.

Of the six hibernacula on NFS land, Big Springs, Cave Hollow/Arbogast, and Two Lick Run are closed to public entry during the hibernation season. Big Springs and Cave Hollow/Arbogast have additional protection from fences or gates. Cave Mountain is gated to protect a Virginia big-eared bat maternity colony, but the cave remains open to the public during the hibernation season.

Primary range around all the hibernacula within the proclamation boundary and within 5 miles outside the boundary includes an estimated 228,000 acres of NFS land. Stihler (1996) found that Indiana bat males foraged and day roosted near hibernacula (within 3.5 miles, or 5.6 km) throughout summer. He observed that these males often switched roost trees from day to day, roosting in trees near ridge tops. Based on Stihler’s work, a 5 mile zone around hibernacula is considered primary range for those Indiana bats that stay around the caves in the summer. Primary range also contains the areas around the caves that are used for fall swarming. The NFS land in these 5 mile zones is similar to habitat in the rest of the Forest, namely mostly forested areas over 60 years old and having dense canopies.

Table 5. Indiana bat hibernacula within the MNF proclamation boundary or within 5 miles outside the boundary.

Cave Name	County	Major or Minor Hibernaculum ¹	Location	Gated or Fenced	Maximum No. Individuals and Winter Observed	Most recent No. Individuals and Winter Observed
Big Springs Cave	Tucker	major	NFS land	yes	254 1994-1995	243 2004-2005
Cave Hollow/ Arbogast Cave	Tucker	major	NFS land	yes	234 2004-2005	234 2004-2005
Two Lick Run Cave	Randolph	minor	NFS land	no	12 1995-1996	0 2003-2004
Bowden Cave System	Randolph	minor	NFS land	no ²	24 1986-1987	0 2004-2005
Coal Run Cave	Tucker	minor	NFS land	no	1 1992-1993	No recent survey
Cave Mountain Cave	Pendleton	minor	NFS land	no ³	1 2002-2003	0 2004-2005
Hellhole Cave	Pendleton	major	within proclamation boundary, not NFS land	yes	11,890 2004-2005	11,890 2004-2005
Izaak Walton Cave	Randolph	major	within proclamation boundary, not NFS land	no	92 2003-2004	92 2003-2004
Stewart Run Cave	Randolph	major	within proclamation boundary, not NFS land	no	83 prior to 2000-2001	36 2003-2004
Falling Spring Cave	Randolph	major	within proclamation boundary, not NFS land	no	49 2000-2001	24 2003-2004
Tub Cave	Pocahontas	minor	within proclamation boundary, not NFS land	no	20 2000-2001	20 2000-2001
Schoolhouse Cave	Pendleton	minor	within proclamation boundary, not NFS land	yes	2 1996-1997	0 2004-2005
Cass Cave	Pocahontas	minor	within proclamation boundary, not NFS land	no	2 1987	No recent survey
Simmons-Mingo Cave	Randolph and Pocahontas	minor	within proclamation boundary, not NFS land	no	No data	No recent survey
Smoke Hole Cave	Pendleton	minor	within proclamation boundary, not NFS land	no	No data	No recent survey
Martha's Cave	Pocahontas	major	within 5 miles outside proclamation boundary	no	285 1995-1996	196 2003-2004
Snedegar's Cave	Pocahontas	major	within 5 miles outside proclamation boundary	no	193 2003-2004	193 2003-2004

Cave Name	County	Major or Minor Hibernaculum ¹	Location	Gated or Fenced	Maximum No. Individuals and Winter Observed	Most recent No. Individuals and Winter Observed
Fortlick Cave	Randolph	major	within 5 miles outside proclamation boundary	no	109 2001-2002	105 2003-2004
Trout Cave	Pendleton	major	within 5 miles outside proclamation boundary	no	95 2004-2005	95 2004-2005
Lobelia Saltpeter Cave	Pocahontas	minor	within 5 miles outside proclamation boundary	no	4 prior to 2000-2001	0 2000-2001
Bob Gee Cave	Greenbrier	minor	within 5 miles outside proclamation boundary	no	3 1990	No recent survey
Gooseberry Cave	Randolph	minor	within 5 miles outside proclamation boundary	no	15 1997-1998	15 1997-1998
Higgenbothams Cave number 1	Greenbrier	minor	within 5 miles outside proclamation boundary	no	No data	No recent survey
Higgenbothams Cave number 2	Greenbrier	minor	within 5 miles outside proclamation boundary	no	No data	No recent survey
Higgenbothams Cave number 3	Greenbrier	minor	within 5 miles outside proclamation boundary	no	No data	No recent survey
Higgenbothams Cave number 4	Greenbrier	minor	within 5 miles outside proclamation boundary	no	No data	No recent survey

¹Major hibernacula typically host dozens, hundreds, or thousands of bats, while minor hibernacula host very few bats in most years.

²Part of the main passage of Bowden Cave is blocked by a safety barricade, but the part of the cave that typically hosts Indiana bats is not gated or fenced.

³Cave Mountain Cave is gated to protect a Virginia big-eared bat maternity colony, but the gate remains open during the hibernation season when the cave is used by Indiana bats.

Threats – The population of this species in the core of its range appears to have declined over the long term despite protection efforts at all known major hibernacula. Causes of the decline are not known; however, researchers are focusing on impacts from surrounding land uses, pesticides, heavy metals, and genetic variability (see reasons for decline listed in USFWS 1999). In contrast, hibernacula monitoring in West Virginia shows that estimated populations have increased since the early 1980s. Most significant caves are gated or fenced, which has protected Indiana bat populations and likely has been responsible for their increases (Wallace pers. comm. 1999).

Human disturbance of hibernating bats and cave vandalism are two primary factors contributing to Indiana bat declines. Other causes include natural disasters, habitat alteration, chemical contamination, historic collecting and handling, poorly designed and installed cave gates, cave commercialization, insecticides and natural predators. The effects of timber harvesting on Indiana bat foraging patterns is unknown, especially during the spring and fall swarm and during summer (Menzel et al. 2001).

Disturbance of maternity colonies also is a potential threat, especially if the disturbance involves removing or damaging maternity roost trees. Also, excessive noise (e.g., construction equipment) near maternity roosts is known to disturb maternity colonies (Garner and Gardner 1992 cited in Evans et al. 1998).

Wind turbines used to generate electric power are a relatively new threat to bats in West Virginia. Although no mortality of endangered bats has been documented, wind turbines on private land in Tucker County were estimated to have killed over 2,000 bats of various species during the period 4 April through 11 November 2003 (Curry and Kerlinger, LLC 2004). During a six-week search period in the summer of 2004, the same turbines were estimated to have killed between 1,364 and 1,980 bats (Arnett et al. 2005). These windmills are not located near any Indiana bat hibernacula. It is reasonable to assume that Indiana bats could be killed if wind turbines were to be constructed closer to hibernacula.

Conservation Measures in the Revised Plan

The revised plan contains the following measures that protect the Indiana bat and contribute to its recovery:

Forest-wide:

- All known roost trees must be retained.
- All shagbark hickories and at least six snags per acre must be retained to provide potential roost trees.
- Riparian foraging habitat is protected through Forest-wide direction for stream channel management corridors.

Primary range:

- Within primary range, it is the goal of the Forest to manage natural vegetation to provide a continuous supply of roost trees and foraging habitat.
- Any vegetation management within primary range must be for the benefit of the Indiana bat or other TEP species, or for safety or research.
- To provide for roost trees, all snags greater than 5 inches dbh must be retained unless they pose a safety hazard. A variety of culls and other residuals are to be retained in harvest units to provide potential roost trees and foraging habitat.
- Any use of explosives cannot have an adverse effect on bat populations or habitat.

In the revised plan, primary range will be managed through Forest-wide direction rather than MP 6.3, but the level of protection and emphasis on Indiana bat management will remain similar to that currently provided in MP 6.3. Where primary range overlaps with MPs that restrict management activities more than Forest-wide primary range direction, the more restrictive MP direction takes precedence.

Hibernacula, key areas, and maternity sites:

- The Forest must designate and maintain a key area of at least 150 acres of mature and late-successional forest within each primary range.
- Most management activities are prohibited in key areas and within 200 feet of hibernacula except those for TEP habitat improvement, safety, and research.
- Seismic exploration and explosive use are not allowed within key areas or within 200 feet of hibernacula unless analysis can show that these activities would not adversely affect bat populations or habitat.
- Surface occupancy for federal mineral operations is not allowed within key areas or within 200 feet of hibernacula.
- Surface occupancy for federal mineral operations within 2.5 miles of a maternity site must be compatible with Indiana bat population maintenance or recovery.
- Major hibernacula are closed to public entry during the hibernation period.
- Known and suspected maternity colonies are surrounded by a management zone up to 2.5 miles in radius, within which protections and management activities are determined on a site-specific basis in coordination with USFWS and WVDNR. Management zones around suspected maternity colonies are maintained for three years if the actual maternity colony is not found. Management zones around confirmed maternity colonies are maintained as long as the potential for maternity activity exists.

In the revised plan, hibernacula, key areas, and maternity sites are managed through Forest-wide direction rather than OA 838, but the level of protection and emphasis on Indiana bat management will remain similar to that currently provided in OA 838.

See the sections on Threatened, Endangered, and Proposed species and Soil and Water Resources in Chapter II of the revised Forest Plan for detailed direction.

Direct and Indirect Effects

Effects from Mineral Operations – Natural gas leasing is by far the most common form of mineral development on the Forest. Although gas exploration and development are generally allowed within Indiana bat habitat, there are a number of restrictions that would limit effects from these activities (see conservation measures outlined above). Other mineral development is rare on the Forest, but could occur in the future. Effects from minerals other than gas developments are difficult to predict because they vary depending on what is being developed, recovery methods, surface disturbance intensity, and reclamation. Federal and privately owned mineral operations and developments are expected to continue throughout the life of the revised Forest Plan. The amount of surface modification associated with future gas development is not expected to be extensive (see description of mineral activities above, also the *Mineral Resources* section in Chapter 3 of the EIS).

For the reasons listed above, it is expected that mineral operations would have minor effects on Indiana bats and their habitats under the revised Forest Plan. However, mineral development usually does involve a certain amount of land clearing and road development, which could remove potential roost trees or harm roosting bats. Therefore, not all risk of adverse effects due to mineral activities can be eliminated.

Development of privately-owned minerals beneath NFS lands is controlled by the deed. While the MNF would attempt to coordinate with private mineral owners and the USFWS to avoid or reduce impacts, the MNF generally has little authority over private mineral operations. Depending on the terms of the mineral severance deed, the MNF may have some discretion over the location of surface occupancy associated with private mineral developments. In such cases the MNF would encourage locations that avoid adverse impacts to Indiana bat sites. The federal action would be limited to the MNF's authority, which may not include the effects of the mineral development itself. Therefore, any effects of private mineral development beyond those over which the deed allows MNF discretion are not analyzed as part of this federal action. ESA compliance for those effects would be the responsibility of the private mineral developer.

Effects from Range Activities – There are currently 1,777 acres of Forest range allotments within Indiana bat primary range. Range allotments do not contain any known hibernacula, key areas, or maternity sites. Development of new range allotments is expected to be limited to newly acquired land that is already pasture or hay land. Range allotment locations and management activities allowed within allotments are not expected to change appreciably in the foreseeable future. Continued range management would involve only minor habitat manipulation such as control of encroaching vegetation. Therefore, effects due to range management would be extremely unlikely.

Effects from Fire-related Activities – Both wildfire and prescribed fire have the potential to destroy or create snags for Indiana bat roost trees or maternity sites. Under the revised Forest Plan, protective measures for NFS lands within 2.5 miles of potential or confirmed maternity sites would be determined at a site-specific level in cooperation with USFWS and WVDNR. Prescribed fire plans would include provisions to protect known roost trees, including both maternity and non-maternity roosts. The one confirmed Indiana bat maternity site (found in 2004) is located in an area that experienced a wildfire in 2003, resulting in a generous number of snags with sloughing bark. This maternity site is on private land within the proclamation boundary and would not be subject to MNF management, although the 2.5-mile radius surrounding the site includes NFS lands that would be subject to conservation measures, with activities to be considered on a case-by-case basis.

Prescribed or controlled fire could also be used to help thin out and maintain favorable foraging and roosting conditions within Indiana bat habitat. Uncontrolled wildfire, on the other hand, would have more potential for stand-replacing events over time as stands age and fuels increase. Stand-replacing fire would add habitat diversity, but, depending on the size of the event, could be detrimental to foraging conditions by opening up too much forest canopy.

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 revised Forest Plan. Objectives focus on Fire Regime Condition Class (FRCC) I, 3 and FRCC III, 2. Within these high priority areas, objectives call for applying prescribed fire to 5 to 15 percent of the acreage within the first decade of the planning horizon. Within the 228,000 acres of primary range on NFS land, an estimated 50,000 acres are in FRCC I, 3 or FRCC III, 2, and are also in areas where prescribed fire is most likely to be applied (MPs 3.0, 6.1, and 8.1). If prescribed fire is applied to the same proportion of high priority land in primary range as in high priority areas on the whole Forest, the revised Forest Plan's objectives for prescribed fire could result in the treatment of 2,500 to 7,500 acres of primary range during the first decade of the planning horizon. This amounts to approximately 1 to 3 percent of all the primary range on NFS land.

Harm or mortality of individual bats could result from smoke entering occupied hibernacula, roost trees, or maternity sites. Prescribed fire and associated fuel reduction activities may also cause harm or mortality through flames, heat, and loss of roost trees. However, prescribed fire is subject to a burn plan, which likely would require that burning be conducted under conditions that optimize smoke dispersal, and

likely would contain provisions to protect hibernacula, known roost trees, and known maternity sites. Therefore, negative effects of prescribed fire on individuals are expected to be infrequent. However, because some roost trees and maternity sites may not be detected, all risk associated with prescribed fire cannot be eliminated. The revised Forest Plan contains goals and objectives for increasing prescribed fire up to ten times the amount currently allowed under the Incidental Take Statement for the current Forest Plan, therefore the revised plan could increase the potential for harm due to prescribed fire.

The revised Forest Plan would continue the current policy of suppressing wildfires when they are detected. Wildfire suppression activities such as fire line construction could destroy potential roost trees. Every effort would be made to avoid known roost trees, within the constraints of protecting human life and property. Typically, wildfire on the Forest does not exceed 100 acres per year, and at this rate the potential effects to Indiana bats and their habitats due to fire suppression activities would be minor. However, roost trees could be affected by fire line construction, and take could result. It is expected that such minor amounts of potential take could be accommodated within the overall acreage objective for prescribed fire. However, any unusually large suppression activities may require emergency Section 7 consultation for effects beyond those covered in this programmatic BA.

Effects from Road-related Activities – Current Forest roads provide edge habitat and travel corridors used by many species, including bats. Road corridors also provide solar exposure to trees and snags along the road, potentially increasing their suitability as roost trees. New road construction or reconstruction would likely increase these beneficial effects. Road decommissioning would have the opposite effect as corridors fill in with trees over time, except where decommissioned roads are maintained as linear wildlife openings.

The major negative effects of road construction are the loss of potential roost trees and potential harm or mortality of roosting bats during clearing of the road alignment. The possibility also exists that Indiana bats could collide with vehicles traveling during the night. However, the majority of night-time vehicular use within Indiana bat foraging areas would occur on state or county roads rather than Forest roads, so collisions are considered extremely unlikely.

Future road construction and decommissioning levels are difficult to predict for a number of reasons (see *Road Transportation System* section in Chapter 3 of the EIS). The overall amount of roads added to the transportation system is expected to be a very small portion of the 228,000 acres of primary range on the Forest due to such factors as MP road density constraints, site-specific resource concerns, and a revised Forest Plan goal to determine the minimum transportation system necessary to achieve access management objectives. Also, Forest-wide standards in the revised Forest Plan prohibit new road construction within 200 feet of Indiana bat hibernacula and require that new roads avoid key areas and maternity sites. For all of these reasons, road-related activities are expected to have small adverse effects on Indiana bats and their habitats. However, the potential for take during road construction and reconstruction cannot be discounted.

Effects from Recreation Activities – Developed recreation facilities include campgrounds, picnic areas, swimming beaches, visitor centers and historic sites. No large-scale facility development is planned for the foreseeable future, but the revised Forest Plan does allow construction of new facilities. Although new facilities are allowed in primary range, any development likely would cover a negligible portion of the total Forest-wide foraging and swarming habitat. Forest-wide direction prohibits the construction of new recreational facilities within key areas and within 200 feet of hibernacula, so developed recreation would not impact these habitat features. Facility construction, renovation, and maintenance is likely to be quite limited for the foreseeable future, with habitat alteration consisting of removal of small numbers of trees in localized areas such as trailheads, campgrounds, picnic areas, etc. Therefore, take due to tree cutting associated with recreation facilities is considered extremely unlikely. Should any large-scale

facility development occur, it is expected that any potential take could be accommodated within the acreage objectives for timber harvest.

Dispersed recreation occurs outside of developed sites and includes activities such as boating, driving for pleasure, fishing, hunting, caving, hiking and biking. Dispersed recreation activities that use existing roads, trails, and other access features do not change habitat structure, so they should have no effect on primary range or maternity sites. Development and reconstruction of trails is expected to be very limited for the foreseeable future, so take due to tree cutting for trail work is considered extremely unlikely. Under the revised Forest Plan, new trail development is prohibited in key areas and within 200 feet of hibernacula, and thus would not affect these habitat components. Therefore, these dispersed recreation activities are unlikely to affect Indiana bats.

Sport caving (spelunking) is fairly popular on the MNF and will likely continue in the future. Revised Forest Plan direction requires that major hibernacula be closed to public entry from September 1 to May 15. Minor hibernacula can remain open to public use if the MNF, USFWS, and WVDNR agree that such use would be extremely unlikely to cause harm or mortality. Based on this direction, Bowden Cave, Coal Run Cave, and Cave Mountain Cave would be likely to remain open during the hibernation season. Two Lick Run Cave, which currently is closed during the hibernation season, could be opened under this direction if the MNF, USFWS, and WVDNR agreed to do so. Based on this direction, it is unlikely that recreational cave use would adversely affect hibernating Indiana bats.

Effects from Watershed and Aquatic Habitat Restoration Activities – Watershed restoration activities are not expected to adversely affect Indiana bats or their habitats because activities would be localized and designed to restore riparian areas or road corridors to productivity over the short and long term. Activities do not typically remove the types of trees that bats could use for roosting or maternity sites. However, if a maternity site is discovered within in a watershed restoration area, protective measures would be determined at a site-specific level in cooperation with USFWS and WVDNR.

Fish habitat restoration likely would not affect Indiana bats or their habitats because restoration activities would be localized within streams and stream banks and would not impair the ability of streams to serve as water sources and foraging corridors. Creation of large woody debris from standing trees could remove some potential roost trees, but this activity likely would involve only scattered individual trees in small, localized areas. Therefore, harm to a roosting bat would be extremely unlikely to occur.

Effects from Wildlife Habitat Management –Wildlife habitat restoration within Indiana bat primary range would be designed to improve or maintain bat habitat and would therefore have beneficial effects. Some of the attributes that characterize optimal Indiana bat habitat, such as larger trees and more snags, may be achieved simply by allowing stands to grow older over time. However, to maintain foraging and roosting habitat with a semi-open canopy and a fairly open midstory would require a certain amount of management in most stands. These conditions would be created or maintained primarily through thinning or uneven-aged harvest. While such timber harvest would be designed to have beneficial effects on Indiana bat habitat, it could negatively affect potential roost trees, roosting individuals, or undiscovered maternity colonies. These negative effects are discussed below under the Timber Harvest section. Beneficial effects could include enhancement of roosting and foraging habitat by creating partial canopy openings. Thinning and uneven-aged harvest would have the added benefit of increasing the growth rate of the remaining trees, which contributes to the development of large-diameter potential roost trees. For the coming decade, the revised Forest Plan contains an objective to conduct 3,000 to 7,000 acres of timber harvest to improve habitat in primary range. This amounts to 1 to 3 percent of the total primary range on NFS lands.

Other types of habitat management that involve timber harvest could occur Forest-wide. While known roost trees would be avoided, such management would have the potential for take through effects to undiscovered roost trees and roosting individuals. These negative effects are discussed below under the Timber Harvest section.

Maintained wildlife openings in primary range generally are not considered habitat restoration for the Indiana bat, although in otherwise closed canopy forested areas, they could contribute to habitat diversity. Proposed wildlife openings in primary range would need to be evaluated on a case-by-case basis to ensure that they benefit the Indiana bat.

Wildlife opening creation would continue Forest-wide. If MP objectives for maintained openings are met, 1,000 to 4,000 acres of new wildlife openings would be created over the next decade. Additional openings likely would be created in later decades of the planning horizon as the Forest strives to meet MP 3.0 and 6.1 desired conditions of 3 to 8 percent of the landscape in herbaceous openings. Many openings are small (< 1 acre) and are created in conjunction with timber harvest activities, i.e., seeded log landings and temporary roads. While creation of such openings may involve minor expansion of the landings, tree removal is very limited and it is extremely unlikely that any take beyond that due to the original timber harvest would result. Larger openings and savannas are sometimes created in areas other than log landings. Tree removal associated with such openings may have a more-than-discountable risk of take. These potential negative effects are covered below in the Timber Harvest section.

Other small-scale wildlife management activities, such as nest boxes, water holes, reptile/amphibian coverboards, etc. are extremely unlikely to affect the Indiana bat.

Effects from Salvage Activities - Timber salvage would occur only after areas have already been damaged or altered by natural disturbances, insect infestations, or disease. Salvage in Indiana bat primary range, which would include hibernacula and key areas on NFS lands, would be unlikely to occur due to a requirement to retain all snags over 5 inches in diameter within harvest units in primary range. The requirement that vegetation management in primary range must be primarily for enhancement or maintenance of Indiana bat habitat also would make salvage unlikely in primary range. Salvage could occur elsewhere across the Forest and potentially affect undiscovered maternity sites or roosting individuals. If allowed by the timing of the salvage activities, surveys would be conducted prior to project implementation to try to identify any unknown maternity sites and roost trees. If a site is discovered, protective measures would be determined at a site-specific level in cooperation with USFWS and WVDNR. Any roost trees discovered, including non-maternity roost trees, would be protected until they no longer serve as roost trees. However, salvage activities often must be conducted quickly following tree mortality, so adequate surveys may not be possible in many cases. Also, mist net surveys cannot guarantee that all roost trees will be located. Therefore, the risk of harm or mortality of roosting bats cannot be eliminated.

Salvage operations on the MNF typically affect few acres in any given year. It is anticipated that small salvage operations in most years can be accommodated within the overall timber harvest objectives contained in the revised Forest Plan. However, should a catastrophic disturbance necessitate a large-scale salvage operation that would cause normal harvest acreage objectives to be exceeded, such a salvage operation would not be covered by the programmatic consultation on the revised Forest Plan and would need to undergo full ESA Section 7 consultation.

Effects from Timber Harvest Activities – Within primary range, which also includes all hibernacula and key areas, management of vegetation 5 inches dbh or greater may only be implemented to improve or maintain Indiana bat or other TEP species habitat, address public or worker safety concerns, or achieve

research objectives. See the discussion of beneficial effects above in the Wildlife Habitat Management Section.

Timber harvest within and outside of primary range could affect unknown maternity sites or roosting individuals, but surveys would be conducted prior to project implementation to try to identify any unknown sites. If a maternity site is discovered, protective measures would be determined at a site-specific level in cooperation with USFWS and WVDNR. Any roost trees discovered would be protected until they no longer serve as roost trees. Plan direction addressing leave trees and snag retention would help maintain essential habitat components and further reduce the likelihood of harming or killing a roosting bat. However, bats are highly mobile and roosting habitat often is ephemeral, so it is possible that some areas harboring roosting Indiana bats would not be discovered or protected by snag retention and leave tree direction. Therefore, the potential for harming a roosting bat cannot be eliminated for any timber harvest operation that occurs outside the hibernation period. Indiana bats on and near the MNF are known to use a wide variety of live and dead trees as roosts, and the density of roosting bats is not known. Therefore, it is not possible to estimate reliably the number of Indiana bats that are expected to be harmed or killed.

Timber harvest has the most potential of any activity for affecting habitat structure, particularly outside of primary range. For example, even-aged regeneration harvests would remove most of the forest canopy, which may not produce optimum foraging habitat for this species. Outside of primary range, timber harvests would not necessarily be beneficial for Indiana bat habitat, but negative effects to habitat would be minor because most roosting, foraging, and swarming activity is believed to occur within primary range.

Timber stand improvement and site preparation may involve control of understory vegetation and small trees up to 5 inches DBH. By enhancing semi-open stand structure, timber stand improvement could have beneficial effects on Indiana bat foraging and roosting habitat. Trees less than 5 inches DBH generally do not provide roosting habitat, so negative effects from timber stand improvement are considered extremely unlikely.

Effects From Gypsy Moth Control – The direct effects to Indiana bats of spraying pesticides for gypsy moth are extremely limited, as these pesticides have shown no impacts to vertebrate species (USDA 1995). Dimilin and Bt kill moths and butterflies indiscriminately, which could affect the Indiana bat indirectly by reducing its food source. Since the pesticide Gypchek is specific to gypsy moth, impacts from its application would be quite limited.

National Forest lands typically would be treated with Bt. Efforts would be made to avoid widespread spraying within 5 miles of a hibernaculum. If spraying within the 5 mile radius is necessary, Gypchek would be the preferred method. These measures make the effects of gypsy moth spraying discountable.

Effects From Firewood Cutting – Firewood permits are issued for dead and downed trees or tree tops/slash from closed timber harvest areas and along roads. Indiana bats are not known to use dead and downed trees or slash for roosting, foraging, or as maternity sites. The only potential negative effect would be noise-related disturbance near roost trees. Given the low level of firewood cutting, the short duration of activity at a given site, and the widely scattered nature of roost trees, such disturbance likely would be insignificant or discountable.

Cumulative Effects

Effects to Habitat – Based on MP allocations and management direction, the revised Forest Plan would have the potential to maintain or improve foraging and roosting conditions in Indiana bat primary range.

Given harvest trends on private lands versus projected harvest levels and special protections for Indiana bats on NFS lands, Forest management activities have the potential to make a positive cumulative contribution to maintenance and enhancement of habitat for this species.

Vandalism of caves and cave gates has the potential to damage hibernacula. Damage to hibernacula may also occur due to natural disasters (flooding, cave subsidence), cave commercialization, and alterations of airflow into caves due to poorly designed and installed cave gates or naturally caused blockages in cave passages. Increased popularity of spelunking on private land could create a shift to increased use of MNF caves. Increased recreational use of MNF caves could contribute to the cumulative effects of alterations to cave habitat, though the potential extent and severity of such alteration is difficult to predict. However, hibernacula on NFS lands are protected by closure orders, Forest Plan direction, and the Cave Resources Protection Act, so there is little or no potential for National Forest management and authorized recreational use to contribute to these cumulative effects.

Effects to Individuals – Hibernating Indiana bats are at risk from human disturbance. During hibernation, disturbances can cause bats to expend fat reserves with no opportunities to replenish during the winter months. Although important hibernacula are gated and closed to protect imperiled bats, gating every potential hibernaculum in the state would be logistically and legally impossible. Thus, unrestricted spelunking across West Virginia could have negative effects on Indiana bats in the future. However, direction in the revised Forest Plan prohibits public entry into major Indiana bat hibernacula during the hibernation season. Therefore, it is extremely unlikely that authorized recreational activities on the MNF would contribute to these cumulative effects.

Handling, banding and counting individuals during hibernation, mist net surveys, and trapping also have the potential to adversely affect individuals. The revised Forest Plan requires Forest Supervisor approval and the appropriate USFWS permits for scientific studies in caves during closed periods, and the ESA and its implementing regulations require permits and use of qualified personnel for mist netting and trapping. It is expected that such approvals and permits will make any contribution by the MNF to such cumulative effects extremely unlikely.

Several animals—including cats, owls, hawks, raccoons, skunks and snakes—are known to prey on bats. Many such small and medium-sized predators are known to frequent edge habitats such as those created by agriculture or forest management activities. However, direction in the revised Forest Plan prohibits most vegetation management within 200 feet of Indiana bat hibernacula, which is expected to minimize the MNF's contribution to the cumulative effects of predation. Gates and barriers used to prevent human access to caves can also contribute to predation by causing bats to slow down and circle prior to entering the cave. Methods have been devised to minimize this problem, such as moving gates a short distance inside the cave entrance so the circling occurs in an area that is too dark to allow successful predation. Therefore, any new gates or barriers are not expected to make a measurable contribution to the cumulative effects of predation.

Mineral developments near hibernacula have the potential to adversely affect Indiana bat individuals or their habitat. The risks posed by mineral developments on private land are reduced to some extent by the take prohibitions in the ESA, as well as the Critical Habitat designation of Hellhole Cave, which is near an ongoing private quarry. On NFS land, direction in the revised Forest Plan prohibits surface occupancy for federal mineral operations within 200 feet of Indiana bat hibernacula. Plan direction also limits seismic exploration and use of explosives to those areas where such activities will not adversely affect Indiana bats or their habitat, including cave passages. This plan direction is expected to eliminate the potential for the MNF to contribute to the cumulative effects of mineral exploration and development.

In addition to risks associated with activities near hibernacula, there is a risk of bat injury or mortality posed by tree felling and prescribed fires. The revised Forest Plan would provide areas where little or no vegetation management would occur; the risk of bat injury or mortality from management-related activities would be minimal or nonexistent in these areas. Continued Forest-wide monitoring of Indiana bats, along with plan direction to protect maternity colonies, roost trees, and many potential roost trees, would help to identify and protect maternity colonies and roost trees in areas where active vegetation management occurs. This protection further reduces the potential for harm or mortality of individuals. In contrast, vegetation management on private lands typically has few safeguards to minimize take, so it is expected that, per acre harvested or burned, private management actions have a much greater potential for harming or killing roosting Indiana bats. However, the expected amount of timber harvest on private land cannot be estimated. Also, Indiana bats in the vicinity of the MNF are known to use a wide variety of live and dead trees as roosts, and the density of roosting bats is not known. Therefore, it is not possible to estimate reliably the cumulative number of Indiana bats that are expected to be harmed or killed.

Wind power development on private land could result in harm or mortality to Indiana bats. The existing threat is believed to be low because the only currently operating wind generation facility in the vicinity of the MNF is not located near any Indiana bat hibernacula. However, a proposed facility outside the MNF in Pendleton County would be very near the southern edge of the primary range circle associated with Trout Cave. The northern edge of this primary range circle includes a small amount of NFS land and additional non-NFS land within the proclamation boundary. Other permitted (but not yet constructed) wind power facilities in Grant County would not fall within any of the primary range circles that overlap the MNF proclamation boundary. As noted above in the Cumulative Effects section for Virginia big-eared bat, the revised Forest Plan contains no goals or objectives for wind energy, and any attempt to analyze the effects at the programmatic level would be speculative. Any future wind energy proposals on the MNF that may affect listed species would not be covered by the programmatic consultation on the plan and would need to undergo full ESA Section 7 consultation.

Determination of Effect

Most of the management activities discussed above have some potential to affect the Indiana bat. Mineral development, prescribed fire, road construction/reconstruction, wildlife management activities that involve timber harvest, and programmed timber harvest have the potential to provide beneficial habitat diversity and structure, but they also have the potential for negative effects to habitat if they reduce canopy closure below the optimum range or if they cut or kill potential roost trees. These activities, if they are conducted outside the hibernation period, also have the potential to harm or kill roosting bats. The revised Forest Plan reduces this risk by protecting known maternity colonies, known roost trees, and many potential roost trees, but because the bats are mobile and roosts are ephemeral, the risk cannot be reduced to the point that it is insignificant or discountable. Activities near hibernacula are governed by Forest Plan direction that reduces the risk to hibernacula and hibernating individuals to the point that it is discountable. The following effect determinations are made for the activities that implement the revised Forest Plan:

May Affect, Not Likely to Adversely Affect:

- Range management
- Recreation management
- Watershed and aquatic habitat restoration
- Small-scale wildlife habitat management
- Timber stand improvement
- Gypsy moth control
- Personal use firewood cutting

May Affect, Likely to Adversely Affect:

- Development of federal minerals
- Prescribed fire and wildfire suppression
- Road construction and reconstruction
- Timber harvest, including salvage and harvesting for wildlife habitat enhancement

Designated critical habitat for the Indiana bat does not occur on MNF land. Therefore, for Indiana bat critical habitat, a determination of **no effect** is made for all activities that implement the revised Forest Plan.

Table 7 shows estimated amounts of management activities that may contribute to take of Indiana bats during the first decade of the planning horizon. Much of the regeneration harvesting shown in the table may be shelterwood harvest, which would require a second entry to remove the residual overstory. Acres for the second entry are not shown in the table, but it is believed that these acres can be accommodated within the high-end estimate for regeneration harvesting.

Table 7. Estimated acreage of management activities on the MNF that may contribute to take of Indiana bats during the first decade of the planning horizon.

Activity	Estimated Acreage During First Decade
Development of federal minerals	740
Prescribed fire and wildfire suppression	10,000 – 30,000
Road construction and reconstruction	630 – 780
Activities involving timber harvest:	
Programmed regeneration harvest	20,000 – 40,000
Programmed thinning	7,000 – 13,000
Timber harvest to improve Indiana bat habitat within primary range	3,000 – 7,000
Timber harvest for spruce ecosystem restoration and enhancement in MP 4.1	1,000 – 5,000
Timber harvest for wildlife openings	2,000 – 4,000 ¹
Timber harvest total	33,000 – 69,000
Total acreage of all activities that may contribute to take	44,370 – 100,520

¹Acreage objective for all wildlife openings, which likely will include openings developed on log landings and temporary roads. The actual amount of timber harvest for wildlife opening creation on uncleared sites is likely to be lower.

West Virginia Northern Flying Squirrel

Existing Condition and Habitat Present

The West Virginia northern flying squirrel is a nocturnal sciurid that inhabits disjunct high-elevation “islands” in the central Appalachians of eastern West Virginia and western Virginia (Menzel et al. 2004). Twenty-five subspecies of northern flying squirrel occur in boreal coniferous and mixed northern hardwood/coniferous forests of North America (USFWS 2001), covering an extensive range from the Pacific to Atlantic Coasts. However, the West Virginia subspecies occurs in a very small range that appears to have been isolated by habitat changes since the last ice age (USFWS 2001). In 1985, the

USFWS added the West Virginia northern flying squirrel to the endangered species list (Federal Register 50:126.). The *Appalachian Northern Flying Squirrels Recovery Plan*, which also covers the endangered Carolina subspecies (*G. s. coloratus*), was released September 24, 1990. An update to the recovery plan was signed on September 6, 2001 which included revised guidelines for habitat identification and management for *G. s. fuscus* (USFWS 2001). To date, no critical habitat has been designated for this species.

Throughout their range, northern flying squirrels use both tree cavities and leaf nests. Leaf nests and cavities serve a variety of purposes including diurnal sleeping sites, feeding stations during nocturnal foraging and as nests for raising young (Menzel et al. 2004). The squirrels apparently subsist on lichens and fungi, but also eat seeds, buds, fruit, staminate cones, and insects (USFWS 2001). Fecal samples of WVNFS indicate the most common foods eaten were lichens, fungi (mostly underground/hypogeous), pollen, and insects (Mitchell 2001).

In the central Appalachians, WVNFS commonly prefer conifer/hardwood ecotones or mosaics dominated by red spruce and fir with hemlock (*Tsuga canadensis*), beech (*Fagus grandifolia*), yellow birch (*Betula allegheniensis*), sugar or red maple (*Acer rubrum*) and black cherry (*Prunus serotina*) associates. WVNFS have also been captured in northern hardwoods with conifer understory (Stihler et al. 1995). Northern flying squirrels have been captured in stands of various ages, understories, densities, and species composition, but most have been in moist forests with some widely-spaced, mature trees, abundant standing and downed snags (USFWS 2001, WVDNR 1997), usually with some conifer (spruce, hemlock, fir) present (Stihler 1994b). These habitats seem well suited to WVNFS' gliding locomotion, cavity nest requirements, and reliance on wood-borne fungi and lichens for food (USFWS 1990).

Habitat and Populations on the MNF – Under the 1986 Forest Plan as amended, suitable habitat for the West Virginia northern flying squirrel is managed under MP 8.0/Opportunity Area 832. Suitable habitat is identified and mapped consistent with the Guidelines for Habitat Identification and Management found in the updated *Appalachian Northern Flying Squirrels Recovery Plan* (USFWS 2001). A map of suitable habitat is collaboratively produced between the MNF, USFWS and WVDNR and is reviewed and refined at the project level. All mapped suitable habitat is assumed to be occupied by WVNFS, and emphasis is placed on protecting this habitat. The current version of the map shows approximately 150,000 acres of suitable habitat on NFS lands.

The Monongahela National Forest is believed to contain a large majority of the range-wide habitat for the West Virginia northern flying squirrel (Stihler pers. comm. 1999). There have been 1,180 documented captures in West Virginia through November 2005; 1,011 have occurred on MNF lands. In general, almost all West Virginia northern flying squirrel captures in West Virginia have been associated with red spruce and mixed spruce/northern hardwood forest types (Stihler et al. 1995).

Surveys conducted to date have documented the range of the species throughout much of the higher elevations of the Forest (USDA Forest Service unpublished data), but data have not been sufficient to determine population levels or trends.

Threats – Almost all of West Virginia's high elevation spruce forest was cut during the railroad logging era from the 1880s to the 1930s. While red spruce regenerated in some areas, fires and soil disturbance that followed logging favored hardwood regeneration in many areas, such that spruce forest within the MNF proclamation boundary now covers a small fraction of its estimated original extent (see Terrestrial Ecosystem Diversity section of EIS Chapter 3).

Beyond direct habitat changes, historical logging also may have favored WVNFS competitors and pathogens via hardwood range expansion. WVNFS may be displaced by the more aggressive southern

flying squirrel (*G. volans*) in certain overlapping hardwood habitats. The southern flying squirrel also may transmit the parasite *Strongyloides robustus*, which can be fatal to northern flying squirrels (USFWS 2001).

The greatest current threat to WVNFS is habitat destruction, fragmentation, or alteration. Negative habitat alterations are associated with forest clearing, mineral extraction, and residential/resort development. Because the Forest Plan contains habitat protections, these threats occur primarily on private land. Possible future declines in spruce forest due to atmospheric deposition of acid and heavy metals threaten to further reduce the range and quality of remaining conifer-hardwood habitats. Lichens and fungi accumulate lead, so WVNFS food sources also may be affected deleteriously by atmospheric deposition (USFWS 1990). Because of the squirrel's small size, the climatic severity of its habitat, and the abundance of avian and mammalian predators, secure nesting sites represent a critical limiting factor (USFWS 2001).

Conservation Measures in the Revised Plan

The revised plan continues the protections contained in the 1986 plan as amended, and builds on those protections with a new emphasis on spruce ecosystem restoration and maintenance. The revised plan contains the following measures that protect the West Virginia northern flying squirrel and contribute to its recovery:

- Most areas of suitable habitat and potential future habitat (spruce restoration areas) are contained within MP 4.1, designated wilderness (MP 5.0), recommended wilderness (MP 5.1), remote backcountry (MP 6.2), or the NRA (MP 8.1). MP 4.1 emphasizes restoration of the spruce forest ecosystem, as well as maintenance of existing high-quality spruce forest. The other MPs emphasize natural disturbance and recovery processes and a general lack of active vegetation manipulation.
- Vegetation management within suitable habitat generally is prohibited except for research on WVNFS habitat improvement, implementation of proven habitat improvement methods for WVNFS or other TEP species, activities to address safety issues, or minor activities that would be unlikely to have adverse effects on WVNFS.
- No new developed recreation facilities may be constructed within suitable habitat. Small facilities may be constructed if they would be unlikely to have adverse effects on WVNFS.
- Special uses must not adversely affect WVNFS populations or habitat.
- Federal gas and oil development in suitable habitat must include protection measures developed through project-specific consultation with USFWS.

In the revised plan, WVNFS suitable habitat will be managed through Forest-wide direction rather than OA 832, but the protections and management emphasis remain similar to OA 832. See the section on Threatened, Endangered, and Proposed species in Chapter II of the revised Forest Plan and MPs 4.1, 5.0, 5.1, 6.2, and 8.1 in Chapter III of the revised Forest Plan for detailed direction.

Direct and Indirect Effects

Effects from Mineral Operations - Natural gas leasing is by far the most common mineral development on the Forest. Development of federal gas would generally be allowed in suitable WVNFS habitat as long as it is within the limits projected within the 1991 Environmental Assessment for oil and gas leasing and development (USDA Forest Service 1991), and as long as protection measures for WVNFS are developed through consultation with USFWS.

Including both production wells and wells associated with gas storage, there are currently 71 existing gas well sites on NFS lands. Only 12 of these occur within suitable West Virginia northern flying squirrel habitat. On average, each well site is about 2 acres with grassy ground cover, similar to hayfields. Access roads and associated pipelines create narrow linear openings and may add up to an additional 14 acres of grassy or graveled area per well site. Effects from future gas development likely would be similar. However, due to the irregular shape of most areas of suitable habitat, for many potential wells it is possible that not all of the impact associated with the well and its supporting facilities would occur within suitable habitat. The MNF would work with lessees to locate impacts outside of suitable habitat to the extent possible. For the foreseeable future, the maximum potential disturbance associated with gas development on all land ownerships within the proclamation boundary is expected to be approximately 740 acres per decade. It is not possible to predict accurately how much of this development would occur within West Virginia northern flying squirrel suitable habitat on NFS land. However, Forest Plan direction to apply site-specific protection measures is expected to make negative effects extremely unlikely.

Development of other federal minerals currently is rare on the Forest, but could occur in the future under the revised Forest Plan. Other than natural gas, coal and limestone are the only minerals known to be present in commercial quantities. Demand for these minerals currently is being met through off-Forest sources, and the scattered nature of federal coal deposits makes them unlikely to be developed in a cost-effective fashion. Therefore, development of minerals other than natural gas is not likely to be extensive (see Mineral Resources section of EIS Chapter 3). Effects from minerals other than gas developments are difficult to predict because they vary depending on what is being developed, recovery methods, surface disturbance intensity, and reclamation. The revised Forest Plan does not specifically address these other operations as they relate to West Virginia northern flying squirrel habitat, so consultation with USFWS would occur on a project-by-project basis. However, given that extensive development is unlikely, adverse effects are considered extremely unlikely.

Development of privately-owned minerals beneath NFS lands is controlled by the deed. While the MNF would attempt to coordinate with private mineral owners and the USFWS to avoid impacts, the MNF generally has little authority over private mineral operations. Depending on the terms of the mineral severance deed, the MNF may have some discretion over the location of surface occupancy associated with private mineral developments. In such cases the MNF would encourage locations that avoid adverse impacts to WVNFS and suitable habitat. The federal action would be limited to the MNF's authority, which may not include the effects of the mineral development itself. Therefore, any effects of private mineral development beyond those over which the deed allows MNF discretion are not analyzed as part of this federal action. ESA compliance for those effects would be the responsibility of the private mineral developer.

Effects from Range Activities - Because some grazing allotments have inclusions of forested land dispersed within them, there are 428 allotment acres currently typed as suitable WVNFS habitat. There is also a single known WVNFS capture record located within a grazing allotment. Revised Forest Plan direction addressing vegetation management in suitable habitat would prohibit vegetation manipulation associated with range management unless it could be shown to have no adverse effects. Continuation of current livestock grazing would be extremely unlikely to affect WVNFS or suitable habitat, as grazing activities would not alter WVNFS habitat or use. Development of new range allotments is expected to be limited to newly acquired land that is already pasture or hay land. Range allotment locations and management activities allowed within allotments are not expected to change appreciably in the foreseeable future. Range management would be extremely unlikely to cause negative impacts to West Virginia northern flying squirrel habitat or individuals because grazing activities and facilities would not detrimentally alter existing habitat or disturb populations.

Effects from Fire-related Activities - Typically, wildfire starts on the Forest do not exceed 100 acres per year, and starts would not generally spread within suitable WVNFS habitat as these areas are high-elevation, moist stands. When wildfire occurs, suppression activities would occur to the extent possible, which could limit fire damage in suitable habitat. Because large wildfires are not likely to occur within suitable habitat, negative effects from wildfire suppression activities would be extremely unlikely.

Prescribed fire activity would not normally occur in suitable squirrel habitat unless the proposed burns meet research or habitat enhancement criteria in the revised Forest Plan direction for suitable habitat. In the unlikely event that prescribed fire is used in suitable habitat, a prescribed burn plan would be developed prior to burning, and consultation with USFWS would also occur to determine ways to avoid adverse effects. Therefore, adverse effects due to prescribed fire are extremely unlikely.

Effects from Road related Activities – Due to restrictions on vegetation management in WVNFS suitable habitat, little road construction and reconstruction is likely to occur in suitable habitat. Limited exceptions to this may be made for research projects, projects related to mineral development, special uses, or access to private lands. Such limited road reconstruction and maintenance within suitable habitat has little potential to affect WVNFS adversely.

Effects from Recreation Activities - Developed recreation facilities include campgrounds, picnic areas, swimming beaches, visitor centers and historic sites. Several developed facilities may exist within suitable WVNFS habitat; however, new developed facilities are prohibited in suitable habitat. Smaller facilities such as trails, trailheads, picnic sites, and ¼-acre vistas are allowed in suitable habitat, but only if project-level analysis determines that an adverse effect is unlikely. Typical maintenance activities do not involve large-scale habitat alteration and would have little or no potential for adverse effects.

Dispersed recreation activities occur outside of developed sites and include activities such as boating, fishing, hunting, hiking and biking. Because WVNFS are nocturnal, dispersed recreation disturbances from hiking, backpacking, hunting, fishing, camping, mountain biking, etc., which typically occur during the day and do not alter the habitat, likely would not affect WVNFS.

Effects from Watershed and Aquatic Habitat Restoration – Watershed restoration activities typically involve stabilization of stream banks, exposed soils, and decommissioned road beds, as well as the addition of habitat structure to stream channels. Such activities have little or no potential to affect West Virginia northern flying squirrels or their suitable habitat. To the extent that such activities involve vegetation management, revised Forest Plan direction would not allow them within suitable habitat unless project-level analysis determined that the activities would not be likely to cause an adverse effect.

Effects from Wildlife Habitat Management – New wildlife habitat improvements would not occur within WVNFS suitable habitat unless they are part of approved research on suitable habitat, they improve suitable habitat based on the results of earlier research, or project-level analysis determines that they would not be likely to adversely affect the West Virginia northern flying squirrel. Therefore, there is little or no potential for adverse effects. Such projects would have the potential for beneficial effects through the enhancement of habitat.

Spruce restoration areas that are outside of suitable habitat have the potential for beneficial effects over the long term. Because these areas are not considered suitable habitat, there is little or no potential for adverse effects due to active spruce restoration, and long-term beneficial effects would be expected due to possible increases in habitat. The revised Forest Plan allocates over 150,000 acres (17 percent of NFS lands) to MP 4.1, which emphasizes passive and active restoration of spruce forest. This compares favorably to the existing Forest Plan, which makes no formal allocations of land to spruce restoration

areas. Within MP 4.1 lands, Forest Plan objectives call for 1,000 to 5,000 acres of active spruce ecosystem restoration and enhancement within the next decade.

Effects from Salvage Activities - Salvage harvesting is not allowed in suitable WVNFS habitat unless it meets the conditions set by Forest Plan direction (research on suitable habitat, improvement of suitable habitat, or is not likely to adversely affect the squirrel). If a natural disturbance damages suitable habitat so extensively that it is no longer considered suitable, salvage harvesting could occur. However, prior to project approval, the suitable habitat map would need to be changed in coordination with USFWS and WVDNR. Therefore, no adverse effects are expected.

Effects from Timber Harvest Activities - Vegetation/timber management generally is not allowed in WVNFS suitable habitat. Exceptions to this prohibition would only occur on a case-by-case basis if they meet the conditions of set by Forest Plan direction (research on suitable habitat, improvement of suitable habitat, or not likely to adversely affect the squirrel). Non-suitable habitat is presumed to be unoccupied by WVNFS (USFWS 2001), so any effects due to timber management outside of suitable habitat are considered discountable. Therefore, timber management is not expected to have adverse effects on WVNFS.

Effects From Gypsy Moth Control – Gypsy moth defoliation and control spraying have been and will continue to be restricted primarily to oak-dominated stands on the MNF. WVNFS does not occur in these stands (Stihler, pers. comm. 1999); consequently, WVNFS will not be directly, indirectly, or cumulatively affected by gypsy moth control.

Effects From Firewood Cutting – On the MNF, firewood cutting is restricted to the removal of dead and downed trees only. WVNFS are not known to nest in downed trees; therefore, firewood cutting would have no direct effects.

Dead and downed wood removal could decrease future amounts of fungi and lichen through removal of growth sites and nutrients. However, firewood removal generally is concentrated along open roads, which limits the extent of potential indirect effects across the MNF. Based on past and current permit levels and the limited spatial context of this activity, direct, indirect, and cumulative effects of firewood cutting are considered insignificant.

Cumulative Effects

Effects to Habitat – Because most WVNFS habitat is on NFS lands on the MNF, timber harvests and other development outside the MNF would have limited effects on WVNFS habitat. However, negative effects due to development or timber harvest could occur on the small fraction of habitat on private land. Due to protections for suitable habitat in the revised Forest Plan direction, MNF management activities have little or no potential to make a measurable contribution to any such negative cumulative impacts.

Continued acid and heavy metal deposition due to industrial activities outside the MNF could reduce future spruce abundance or change soil pH enough to alter fungal growth and availability (a primary food source for WVNFS). MNF activities do not contribute to these pollution sources, and protections for suitable habitat in the revised Forest Plan direction would greatly limit the potential for timber removal from NFS lands to contribute to any nutrient depletion associated with atmospheric deposition.

Suitable habitat is expected to increase substantially under the revised Forest Plan due to continued maturing of second growth forests, land allocation to MP 4.1 spruce restoration areas, and Forest-wide direction for protection of suitable habitat. Thus, Forest management activities should have overall positive cumulative effects on WVNFS habitat.

Effects to Individuals – Effects to individuals generally involve direct harm or mortality in association with activities that alter or destroy occupied habitat. Because NFS lands on the MNF contain a large majority of habitat for the squirrel, activities on non-NFS lands have limited potential for affecting individuals. However, such effects could occur in conjunction with development or timber harvest on the small fraction of habitat that is not on NFS lands. Due to protections for suitable habitat in the revised Forest Plan direction, MNF management activities have little or no potential to make a measurable contribution to any such negative cumulative impacts.

Determination of Effect

Due to the strong protections contained in the revised Forest Plan, the management activities discussed above have very little potential for negative effects on the West Virginia northern flying squirrel. Forest plan direction essentially prohibits adverse effects due to vegetation management activities, so potential effects due to timber harvest and associated roads, salvage, prescribed fire, range, watershed restoration, and wildlife/fish habitat enhancement are discountable. Most new recreational facilities must avoid suitable habitat, and the small developments that can occur in suitable habitat must cause no adverse effects; therefore, potential negative effects due to recreation management are discountable. Federal mineral exploration and development are allowed in suitable habitat, but are not expected to be extensive and are subject to site-specific protection measures to avoid adverse effects. Firewood cutting in suitable habitat is expected to be greatly limited by lack of access. Because of these protection measures, any potential adverse effects are expected to be insignificant or discountable. Passive and active spruce restoration has the potential for substantial beneficial effects. Because all effects are expected to be insignificant, discountable, or beneficial, for the West Virginia northern flying squirrel, a determination of **may affect, not likely to adversely affect** is made for the implementation of the revised Forest Plan.

Bald Eagle

Existing Condition and Habitat Present

The bald eagle was first listed on March 11, 1967. On July 12, 1995, the USFWS reclassified the bald eagle from endangered to threatened throughout the lower 48 states (Federal Register 1995). Previously it had been listed as endangered in most of the lower 48 states, including West Virginia. On July 6, 1999, the bald eagle was proposed to be delisted, based on recovery data. Public comment for this proposal ended in October 1999, and USFWS is currently reviewing information related to the proposed delisting. USFWS divided the 48 states into 5 recovery regions, for which plans were written. The MNF falls into two of these regions: the Chesapeake Bay region includes the eastern panhandle of WV, and the Northern States region includes the rest of the MNF. There is no designated critical habitat in the vicinity of the MNF.

Bald eagles are closely associated with large bodies of water with abundant fish populations during both the breeding and non-breeding season (Buehler 2000, DeGraaf and Yamasaki 2001). Bald eagles forage along rivers, large streams, and lakes, where they perch in trees near the water's edge and wait for fish or waterfowl to come along. The bald eagle's diet consists of fish, waterfowl and other birds, carrion, small- to medium-sized mammals, and turtles (DeGraaf et al. 1991). The proportional importance of the various food items may vary regionally. Breeding most often occurs within 1 mile of the water bodies that provide primary food sources (USFWS 1990a). Nests are built in super-canopy trees approximately 100 yards from the nearest forest edge (Cline 1985). Overall, bald eagles prefer areas with limited disturbance from humans (Buehler et al. 1991), although anecdotal reports suggest that some individuals or pairs can

become habituated to various levels of human activity (e.g., Stihler and Wallace 2002, Stihler and Wallace 2004).

In West Virginia, present-day records of successful nesting are limited to the Potomac River drainage in the eastern panhandle, although unsuccessful nesting activity has occurred at two sites along the Ohio River (Stihler et al. 2001, Stihler and Wallace 2005). The population of nesting eagles in West Virginia, as in other parts of the country, has increased steadily over the last two decades. In 2005 19 nests were monitored in West Virginia, and 14 successful nests fledged 16 young bald eagles (Stihler and Wallace 2004).

Habitat and Populations on the MNF – Although riparian forests are widespread and common on the MNF, large bodies of water that are suitable for eagle foraging are limited. The Smoke Hole area, in the northeastern part of the MNF along the South Branch of the Potomac River, provides good forage and nest habitat. Although the MNF has no large lakes or impoundments, smaller lakes such as Buffalo Lake, Summit Lake, Spruce Knob Lake and Lake Sherwood provide potential habitat. Lake Moomaw on the George Washington National Forest is a larger lake located approximately 5 miles from the MNF's southeastern border. Bald eagles have nested at this lake. The small lakes on the MNF may be used primarily by non-breeding eagles traveling south from northeastern breeding areas, or north from southern breeding areas. Larger river corridors, such as the South Branch of the Potomac, also provide potential nesting and feeding areas.

Two recent bald eagle nest sites are known from the MNF, both in the Smoke Hole vicinity. One of these nest sites (the Smoke Hole site) has consistently fledged young for a number of years, while the other (Shreve's Store site) was first discovered during the 2003 nesting season (Table 8, data from WVDNR). The Smoke Hole site was not monitored during the 2005 nesting season. Both sites are in the NRA, and the Smoke Hole site is located in a remote backcountry area of the NRA.

Table 8. Numbers of young fledged at the Smoke Hole and Shreve's Store bald eagle nest sites.

Year	Number of Young Fledged	
	Smoke Hole Site	Shreve's Store Site
1990	3	NA
1991	2	NA
1992	2	NA
1993	1, maybe 2	NA
1994	1	NA
1995	unknown	NA
1996	3	NA
1997	1	NA
1998	1	NA
1999	2	NA
2000	2	NA
2001	2	NA
2002	2	NA
2003	1	1
2004	2	2
2005	unknown	1

Threats – Pesticide (DDT and DDE) and heavy metal accumulations reduced bald eagle reproduction and caused most of the historic population decline (Cline 1985). However, shoreline and wetland destruction also have eliminated eagle habitat. Suspension of DDT use in 1972 has resulted in substantial population increases, and bald eagle numbers are no longer declining (hence the proposed delisting).

Direct human disturbance, including intentional shooting, has also contributed to historic population declines. Although the bald eagle population in West Virginia is increasing, several eagles have been shot in West Virginia in the past decade. Shootings and disturbance at nest sites still affect eagles in this state (Stihler and Wallace 2003, 2004, 2005). Current MNF management activities, including recreation, do not appear to be negatively affecting bald eagle nesting at either MNF site, as young are being fledged annually.

Habitat destruction and degradation via shoreline development, recreational waterway and shoreline use, and non-point and point source water pollution still threaten bald eagles in some areas (Federal Register 1995).

Conservation Measures in the Revised Plan

The revised plan contains the following measures that protect the bald eagle and contribute to its recovery:

- A 1,500-foot protection zone must be maintained around nest sites that have been active within the past three years. Activities in this zone must be examined on a case-by-case basis and must be consistent with bald eagle management.
- Seasonal closure orders may be used to control human disturbance in the vicinity of nests.
- Nests and nest trees may not be removed or damaged as long as any usable portion of the nest remains, except where public health or safety concerns exist.
- Potential foraging, roosting, and nesting habitat near streams is protected by Forest-wide stream channel management corridors.
- One of the two known nest sites on the MNF is in a part of the NRA that will be managed as remote backcountry.

See the sections on Threatened, Endangered, and Proposed species and Soil and Water Resources in Chapter II of the revised Forest Plan for detailed direction.

Direct and Indirect Effects

All MNF management activities would have little or no potential to affect the bald eagle. Under the revised Forest Plan, both known nest sites are in the Spruce Knob-Seneca Rocks National Recreation Area, and one site is in a remote backcountry portion of the NRA. Little or no active management is expected near these sites, and public motorized access would not be allowed in the vicinity of the Smoke Hole site. Dispersed recreation would be the only potential source of impacts, and current levels of use have not caused problems. Should increased use become a concern, revised Forest Plan direction provides for closure orders to control disturbance.

On a Forest-wide basis, potential foraging habitat would be protected from most negative impacts of management activities by revised Forest Plan direction for soil and water. This direction places buffers of 100 feet on perennial and large intermittent streams, 50 feet on small intermittent streams, and 25 feet on ephemeral streams. Within these buffers, all programmed timber harvest and all but essential soil disturbance (e.g., road crossings) is prohibited. This protection is expected to reduce management-related

impacts to water quality to a negligible level from the standpoint of eagle foraging habitat. Continued maturation of trees in these buffers likely would improve nest site availability over the long term, and continued recovery of aquatic communities from historic impacts likely would improve foraging habitat. Also on a Forest-wide basis, revised Forest Plan direction protects all bald eagle nests, whether currently known or discovered in the future, with 1,500-foot buffers. Within these buffers, management strategies that are compatible with eagle nesting would be determined on a case-by-case basis. For these reasons, the potential for negative effects would be negligible, while improvements in nesting and foraging habitat would be likely.

Cumulative Effects

Activities off of NFS land have the potential to affect bald eagle habitat and individuals. Timber harvest and land development for a variety of uses have the potential to degrade or eliminate potential nesting and foraging habitat. Passive management on private land also has the potential to improve nesting and foraging habitat. ESA take prohibitions protect nest sites even on private land, but the potential for negligent or malicious destruction of nest sites still exists. Direct harassment or harm to individuals, both negligent and intentional, also could affect bald eagles on all land ownerships despite ESA take prohibitions. Taken cumulatively, all of these activities have the potential to negatively affect bald eagle habitat, individuals, and populations. However, given the protections contained in the revised Forest Plan direction, which are likely to reduce potential adverse direct and indirect effects of MNF management to a negligible level, MNF management has little or no potential to contribute to cumulative negative effects. Conversely, MNF protection of nest sites, potential riparian nesting habitat, and aquatic foraging areas would likely make a substantial contribution to beneficial cumulative effects.

Determination of Effect

Due to Forest Plan protections, potential negative effects of all management activities are discountable. Due to the expected continued maturation of potential nest trees and recovery of aquatic foraging habitat, beneficial effects could occur. Therefore, for the bald eagle, a determination of **may affect, not likely to adversely effect** is made for the implementation of the revised Forest Plan.

Cheat Mountain Salamander

Existing Condition and Habitat Present

The Cheat Mountain salamander was listed as threatened on August 18, 1989. A Recovery Plan was released on July 25, 1991 (USFWS 1991a.). Critical habitat has not been designated.

The Cheat Mountain salamander is a relict species with isolated populations (Pauley and Pauley 1997, Kramer et al. 1993). It is geographically restricted to high-elevation forests containing a red spruce component and mixed deciduous forests with a *Bazzania*-dominated forest floor (Pauley and Pauley 1997). The species' entire range is limited to the higher portions of the Allegheny Mountains in northeastern West Virginia (Pauley and Pauley 1997).

The plethodontid salamanders, of which the Cheat Mountain salamander is a member, are characterized by the absence of lungs. Thus, respiration occurs through the skin (Feder, 1983), for which the skin must remain moist to permit oxygen permeation. Moist skin also is needed for cutaneous absorption of water because the salamanders do not drink water (Heatwole and Lim 1961). Salamanders have preferred temperature ranges that minimize dehydration (Spotila 1972). Because of these physiological requirements, Cheat Mountain salamanders require microhabitats with high relative humidity (Feder

1983, Feder and Pough 1975) and acceptable temperatures. Old, structurally complex forests are more likely than young forests to provide the necessary moist, stable microenvironment (USDA Forest Service 2001).

Foraging and mating are inhibited or enhanced by external moisture and temperature conditions (Keen 1984). Every other year between late spring and mid summer, females deposit egg clusters containing 4 to 17 eggs under refugia, such as rocks or rotten logs (Green and Pauley 1987, USFWS 1991a). The salamander's diet includes mites, springtails, beetles, flies, ants, and various other insects (Pauley 1980). Foraging on the forest floor and occasionally on tree trunks is done at dusk (Green and Pauley 1987) when relative humidity is high (Spotila 1972).

Habitat and Populations on the MNF - High potential Cheat Mountain salamander habitat on NFS land is estimated at over 100,000 acres; surveys have documented occurrences at scattered locations within that habitat (USDA Forest Service unpublished data). A few known occurrences lie outside mapped high potential habitat. Cheat Mountain salamanders are generally confined to high-elevation areas in the northern and central portions of the Forest. While this species is typically associated with spruce, studies have not conclusively established a preference for any one forest type. Recent surveys have expanded the known range of the Cheat Mountain salamander to about 935 square miles, with about 65 of the 85 known occurrences located on the MNF.

Threats - The extensive logging of spruce around the turn of the century is the most likely cause of decline for this species. Competition from other similar plethodontids, genetic isolation of populations, habitat degradation (e.g., acid deposition), habitat fragmentation, and habitat disturbance all continue to contribute to the limited occurrence of the species (Pauley 1980, USFWS 1991a).

Conservation Measures in the Revised Plan

The revised plan contains the following measures that protect the Cheat Mountain salamander and contribute to its recovery:

- It is the goal of the Forest to identify opportunities to reduce fragmentation of populations and habitat.
- When vegetation or ground disturbance is proposed in known or potential habitat, field surveys must be conducted and occupied habitat must be delineated.
- Ground and vegetation-disturbing activities are not allowed in occupied habitat and a 300-foot buffer around occupied habitat, unless analysis can show that activities would not have an adverse effect on populations or habitat.
- Most areas of occupied and potential habitat are contained within MP 4.1, designated wilderness (MP 5.0), recommended wilderness (MP 5.1), remote backcountry (MP 6.2), or the NRA (MP 8.1). MP 4.1 emphasizes restoration of the spruce forest ecosystem, as well as maintenance of existing high-quality spruce forest. The other MPs emphasize natural disturbance and recovery processes and a general lack of active vegetation manipulation.

See the section on Threatened, Endangered, and Proposed species in Chapter II of the revised Forest Plan and MPs 4.1, 5.0, 5.1, 6.2, and 8.1 in Chapter III of the revised Forest Plan for detailed direction.

Direct and Indirect Effects

The revised Forest Plan provides essentially complete protection for Cheat Mountain salamander occurrences on NFS land. Forest-wide direction requires that, prior to any ground- or vegetation-disturbing activity, known and potential habitat be surveyed and the extent of occupied habitat be delineated. The direction further requires that ground- and vegetation-disturbing activities be avoided in occupied habitat and a 300-foot buffer, unless analysis shows there would be no adverse effect on populations or habitat. Therefore, most management activities are not expected to adversely affect the Cheat Mountain salamander, and a discussion of effects for each activity is not presented here. However, two activities have a slight potential for effects.

Increased recreational use of existing trails and facilities in occupied habitat could cause an increase in fragmentation of populations. If trails are used heavily enough to prevent accumulation of leaf litter, they may limit Cheat Mountain salamander movement and territory size (Pauley pers. comm. 1999). However, the revised Forest Plan contains a goal to identify opportunities to reduce fragmentation of populations and habitat, so it is likely that a trail would be closed or relocated if it is identified as causing an increase in habitat fragmentation.

Also, personal use firewood cutting can occur adjacent to open roads anywhere on the MNF, including Cheat Mountain salamander habitat. Firewood cutting is limited to dead and down wood, so it does not change canopy conditions that help provide the necessary moist microclimate. It does remove potential future cover objects (downed logs), which could reduce future habitat suitability. However, this effect is expected to be quite limited because personal use firewood is hand-carried to the cutter's vehicle; thus, it tends to be gathered immediately adjacent to open roads. Because Cheat Mountain salamanders prefer rotten logs over sound wood when seeking cover, firewood cutting is not likely to directly affect currently occupied cover objects or the individual salamanders hiding under or in them.

Because of the protections contained in the Forest Plan direction, implementation of the revised Forest Plan is not expected to have any measurable negative effects on the Cheat Mountain salamander. Beneficial effects could occur due to active and passive spruce restoration in MP 4.1, but only if salamanders are able to recolonize or are relocated to restored habitat.

Cumulative Effects

Current levels of Cheat Mountain salamander populations are likely a result of the extensive logging of their spruce habitat in the early 1900s. With an estimated 88 percent of populations within the MNF boundary (Pauley pers. comm. 1999), timber harvesting and other activities on non-NFS land would have limited potential for broad-scale effects on Cheat Mountain salamander habitat and populations. However, negative effects to habitat and populations on non-NFS lands could occur, particularly due to residential/resort development and timber harvesting on private land. Other sources of cumulative effects to habitat or individuals include competition from other plethodontids, predation, and altered soil chemistry due to acid deposition. Because of the protections contained in the revised Forest Plan, MNF management would not have the potential to make a measurable contribution to these cumulative negative effects.

Determination of Effect

Due to Forest Plan protections, potential negative effects of all management activities are insignificant or discountable. Due to the expected passive and active restoration of spruce forest in MP 4.1, beneficial effects could occur. Therefore, for the Cheat Mountain salamander, a determination of **may affect, not likely to adversely effect** is made for the implementation of the revised Forest Plan.

Small Whorled Pogonia

Existing Condition and Habitat Present

Small whorled pogonia (SWP) is perennial plant in the orchid family. It was listed as endangered on September 9, 1982. It was downlisted to threatened on October 6, 1994. A recovery plan was completed in 1985 and revised on November 13, 1992 (USFWS 1992a). Critical habitat has not been designated for this species.

SWP is broadly distributed (Maine to Georgia), but populations are separated widely. The species has three primary population centers: Appalachian foothills in New England; Blue Ridge Mountains of North Carolina, South Carolina, Georgia, and Tennessee; and coastal plain and piedmont provinces of Virginia, Delaware, and New Jersey. Other populations, including two sites in West Virginia (one on the Forest), are much smaller.

Habitat includes mixed deciduous and mixed deciduous/coniferous forests. Most SWP sites share common characteristics, including relatively open understory and proximity to logging roads, streams, or other features that create persistent breaks in the forest canopy (Mehrhoff 1989). Highly acidic, nutrient poor soils may be characteristic of habitat; however, with only two known sites in West Virginia, local generalizations are difficult. Small whorled pogonia is characterized by wide population fluctuations from year to year and is known to remain dormant in some years (USFWS 1992a).

Habitat and Populations on the MNF - SWP is only known from one location within the Forest boundary. No plants were observed at this location when it was last surveyed in 2002 (West Virginia Natural Heritage Program unpublished data). The habitat at this site includes dry forest associates such as white pine (*Pinus strobus*), sassafras (*Sassafras albidum*), witch hazel (*Hamamelis virginiana*), spicebush (*Lindera benzoin*), a shield fern (*Thelypteris goldiana*), and cinnamon fern (*Osmunda cinnamomea*). The area is traversed by 80+ year-old logging roads. While the local flora are described as dry woodland type, the relative humidity of the microhabitat is higher than the surrounding landscape due to moisture from adjacent ephemeral streams.

Based on a broad description of potential habitat that includes mesophytic deciduous, mature oak, mature oak-pine, and hemlock forests, the terrestrial species viability evaluation (SVE) that was conducted for the plan revision EIS characterized habitat for this species as common (see Terrestrial Species Viability and Threatened and Endangered Species sections in EIS Chapter 3). However, the very limited distribution of small whorled pogonia on the MNF may indicate the existence of a microhabitat preference that is not reflected in the habitat ratings, or it may indicate the action of an unidentified threat. Alternatively, it could be the result of inadequate survey efforts, or some combination of these factors.

Threats - Habitat destruction is the primary threat to SWP range-wide. Herbivory by deer, and collecting and damage from research activities are secondary threats (USFWS 1992a). Suitable SWP habitats may decline as canopies become denser and forest floor light is reduced.

Conservation Measures in the Revised Plan

The only known occurrence of SWP on NFS land is in an area that is not considered suitable timberland. Because there is only one known location on NFS land and the species' habitat preferences in West Virginia are not well-known, the revised plan does not contain specific direction for SWP. However, the

typical project planning protocol includes botanical surveys, which would provide the opportunity to avoid any occurrences that may be discovered.

Direct and Indirect Effects

Effects from Mineral Operations - Federal mineral leasing, exploration, and development may occur within potential SWP habitat, but development is not expected to be extensive (see the activity descriptions above and the *Mineral Resources* section of EIS Chapter 3). By far the major activity that could affect this species is disturbance related to gas development (well sites, roads, pipelines). On average, each well site is approximately 2 acres, with associated roads and pipelines that create narrow linear openings and ground disturbance, for a total of about 15.5 acres of disturbance. Negative effects could occur if individuals or populations are directly eliminated from the disturbance site; however, site-specific surveys prior to operations, which are usually required as part of project-level ESA Section 7 consultation, would provide the opportunity to avoid occurrences.

Development of privately-owned minerals beneath NFS lands is controlled by the deed. While the MNF would attempt to coordinate with private mineral owners and the USFWS to avoid impacts, the MNF generally has little authority over private mineral operations. Depending on the terms of the mineral severance deed, the MNF may have some discretion over the location of surface occupancy associated with private mineral developments. In such cases the MNF would encourage locations that avoid adverse impacts to SWP. The federal action would be limited to the MNF's authority, which may not include the effects of the mineral development itself. Therefore, any effects of private mineral development beyond those over which the deed allows MNF discretion are not analyzed as part of this federal action. ESA compliance for those effects would be the responsibility of the private mineral developer.

Effects from Range Activities – SWP habitat would not be affected by continued range management activities because existing pasture areas are not potential habitat for SWP. Any new range allotments likely would be limited to newly acquired land that is already managed for grazing, so new allotments also likely would have no potential to affect small whorled pogonia.

Effects from Fire-related Activities – The extent and location of fire suppression activities is difficult to predict due to the unpredictable nature of wildfires. Negative effects could occur if individuals or populations are directly eliminated from site disturbance such as fire lines. However, wildfire and fire suppression activities are currently at fairly low levels on the Forest, and they are not expected to increase dramatically over the short term. Given the apparent rarity of small whorled pogonia on the MNF, the chance of these limited suppression activities affecting an occurrence of small whorled pogonia is extremely low.

Prescribed fire is allowed within most areas of the Forest, and could occur in potential habitat for small whorled pogonia. Site-specific burn plans would be completed at the project level for each burn, and these plans would be designed to mitigate any potential adverse effects on TEP species. Prescribed fire is not likely to be used as a vegetation management tool in hemlock and mixed mesophytic forests as fire is not considered a common disturbance in these areas. The known SWP site is located in an area considered to be Fire Regime I (0-35 years, low intensity). The known SWP site is in a mesic micro-site within this landscape. Prescribed fire is likely to be used in oak and oak-pine forests to aid in regeneration of oaks and to return this disturbance regime to the landscape. Based on the one known site, even if prescribed fire used in such an area, the moister micro-sites where small whorled pogonia could be found would likely not burn. On all but the most xeric sites on the Forest, prescribed fire is expected to create a patchy burn pattern with some areas left unburned. Potential effects from prescribed fire could be loss of individuals but not habitat. Habitat may be positively affected by prescribed fire by increasing

light to the forest floor. Because of these reasons, it is unlikely that prescribed fire would have any measurable effect on this species or its habitat.

Effects from Road-related Activities - Various road management activities (construction, reconstruction, decommissioning and maintenance) could affect individuals, populations, or habitat if small whorled pogonia turns out to be more widespread than the current single known occurrence indicates. Negative effects could occur if individuals or populations are directly eliminated from the disturbance site; however, site-specific surveys prior to operations would provide the opportunity to avoid occurrences.

Effects from Recreation Activities – Developed and dispersed recreation activities would not measurably affect SWP population or habitat. No large-scale facility or trail development is planned under the revised Forest Plan. Although facilities are allowed in many areas, any development would be very small on a Forest-wide scale, and site-specific surveys prior to construction would provide the opportunity to avoid any occurrences of small whorled pogonia. Facility and trail maintenance would not affect habitat.

Effects from Watershed and Aquatic Habitat Restoration Activities - Soil and water restoration activities tend to occur in localized areas and would be preceded by site-specific surveys prior to project implementation. Short-term effects from disturbance would be similar to those described above for road-related activities.

Effects from Salvage Activities – Timber salvage would occur only after areas have been already damaged or altered by natural disturbances. Effects would be extremely unlikely due to the relatively small scale of salvage operations on this Forest. Any activities would be preceded by site-specific surveys for TEP plants, which would provide the opportunity to avoid any occurrences of small whorled pogonia.

Effects from Wildlife Habitat Management - Wildlife opening or savannah establishment could eliminate individuals or populations from the disturbance site; however, site-specific surveys prior to operations would greatly reduce this potential. Potential effects from fire or harvest-related habitat treatments are covered elsewhere in this section. Fisheries habitat restoration activities would likely have no effect on SWP populations or habitat because they would not occur within potential habitat.

Effects from Timber Harvest Activities – Timber harvest would likely have the greatest potential for effects on SWP habitat due to the relatively widespread potential for ground disturbance and habitat manipulation. However, direct and indirect effects to SWP generally would be avoided through surveys made before action is taken. Because 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 that are possible if the plant is missed in surveys include destruction of habitat or loss of individuals. However, because the species is so rare, the chance that a timber harvest would be located on an occurrence site is very small.

Effects From Gypsy Moth Control – Dimilin, Bt, or Gypchek spraying to control gypsy moth would not directly affect SWP because it can self-pollinate. Thus, effects to non-target pollinators would not be detrimental to SWP.

Effects From Firewood Cutting – The only known population of SWP on the MNF is not located along an open road. The number of firewood permits and miles of open roads are limited, so the probability of affecting SWP by firewood cutting is discountable. Furthermore, some firewood cutting and gathering

occurs when SWP is dormant. Therefore, firewood cutting will not likely directly, indirectly or cumulatively affect SWP.

Cumulative Effects

Effects to Habitat – On NFS lands, it is projected that there would be no substantial change from current levels in the overall amount of old and mature mixed mesophytic forest under the revised Forest Plan. Hemlock forest may decrease due to woolly adelgid infestations, but reductions would not be the result of management strategies and would occur regardless of whether the revised Forest Plan is implemented. The area in mature oak and mature oak-pine forests will increase over time as forests age. Some stands will be selected for regeneration harvest, but across the Forest, a large majority of this habitat type will be available. Therefore, little or no cumulative effects from management-related activities are expected to the available amount of potential habitat. Micro-habitat requirements are not well understood, and there is potential for passive changes in habitat structure as these forests age over time. What effects this would have on habitat potential are unknown, but they would occur on both NFS and private lands, with NFS land having a large contribution to the overall cumulative trend.

Effects to Individuals – The only known occurrence of this species within the Forest boundary is on NFS land in an area where timber harvest and associated activities are not allowed under the existing Forest Plan or the revised Forest Plan. Thus, there is no potential for these activities to contribute to cumulative effects to this population. Should undiscovered occurrences exist, both MNF management activities and activities on private land would have the potential to impact individuals, to the extent individuals occur in areas where management activities are likely. Because much NFS land is not available for large-scale vegetation management and pre-project surveys would provide the opportunity for avoidance, the MNF contribution to these cumulative effects is expected to be negligible.

Other potential cumulative effects to this species would include herbivory by deer, and collecting and damage from research activities. MNF management theoretically could contribute to deer herbivory to the extent that management near occurrences creates edge habitats that facilitate an increase in the carrying capacity for deer. However, hunting is the primary tool used to manage actual deer population levels (Evans et al. 1999), and setting hunting regulations is the responsibility of WVDNR. Therefore, MNF management will not affect the primary factor influencing deer population levels and the potential for deer browse. Collecting and destructive research techniques would require permits from both the MNF and the USFWS; conditions attached to these permits are expected to render adverse effects insignificant.

Determination of Effect

MNF management would have essentially no potential to affect the one known occurrence of small whorled pogonia on NFS land. This site is in an area where programmed timber harvest would not occur, and because the site is known, other management activities could easily avoid it.

Most MNF management activities have the potential to affect potential habitat or currently unknown occurrences of small whorled pogonia, to the extent they occur in areas where management activity is likely. However, site-specific surveys for TEP plants are a standard part of the ESA Section 7 consultation process. Should additional occurrences of small whorled pogonia be discovered, it is believed that most management activities could be redesigned to avoid the occurrences. Therefore the potential for adverse effects is discountable. For small whorled pogonia, a determination of **may affect, not likely to adversely affect** is made for the implementation of the revised Forest Plan.

Shale Barren Rockcress

Existing Condition and Habitat Present

Shale barren rockcress (SBRC) is a biennial herb found on shale barrens in eastern West Virginia and western Virginia. Shale barren rockcress was listed as endangered on July 13, 1989. USFWS completed a Recovery Plan in August 1991. Critical habitat has not been designated.

The global distribution of this species is limited to five counties in western Virginia and four counties in eastern West Virginia. About 33 populations are known, most of which contain fewer than 50 plants. The total number of plants range-wide may be less than 1,000 (Norris and Sullivan 2002).

Mid-Appalachian shale barrens generally are characterized by open (<10% canopy closure), scrubby pine, oak, red cedar (*Juniperus virginiana*), and other woody species growing on dry, south-facing steeply-sloping (>20%) shale formations. Open herbaceous cover adapted to this harsh environment also can occur (USFWS 1991b). Often the slope is undercut by a stream directly below the shale barren. In the mid-Appalachians, the shale formations are generally upper Devonian-age, though some are Ordovician- and Silurian-age (USFWS 1991b).

Habitat and Populations on the MNF - Potential and known habitat within the entire MNF is estimated to be less than 100 acres. Habitat abundance was determined to be rare and distribution patchy through the SVE process. West Virginia Natural Heritage Program records (unpublished data) show 11 element occurrences within the Proclamation boundary, all but one of which is on Forest Service land.

Threats - Shale barrens on NFS land are protected under the 1986 Forest Plan as amended and are not likely to be vulnerable to destruction from any MNF management activity. Regional threats to existing SBRC populations include deer herbivory and invasion of non-native species. Goat and sheep grazing have caused the most destructive herbivory of shale barren rock cress in West Virginia (2 sites, USFWS 1991b). Insect pollinators are vulnerable to Dimilin spraying for gypsy moth control. The primary threats and causes of SBRC decline have been road and railroad construction, which have destroyed several known West Virginia and Virginia shale barrens (USFWS 1991b). A flood control dam has detrimentally affected one population (USFWS 1991b). Because of a lack of commercial timber on shale barrens, shale barren rockcress habitat is generally not under threat from forest management practices.

Conservation Measures in the Revised Plan

Vegetation and ground disturbance are prohibited in shale barrens except for research or when no feasible alternatives exist.

Direct and Indirect Effects

Direction in the revised Forest Plan prohibits vegetation manipulation and ground-disturbing activities within shale barrens unless no feasible alternatives exist. Because shale barren habitat is so rare, it is extremely unlikely that management activity could not be redesigned to avoid the habitat. Because the species is only known from shale barrens, there is little or no potential for the species to occur in unprotected habitats outside of shale barrens. However, standard pre-project surveys for TEP plants should provide the opportunity to avoid any occurrences in atypical habitat. Therefore, the potential for any MNF management activity to affect shale barren rock cress would be negligible. Since the known shale barrens are found in areas considered Fire Regime I or III (0-35 years, low intensity, and 35-100 years, mixed severity, respectively), prescribed fire may be used in areas around shale barren rockcress

habitat. Prescribed fire around shale barrens could have a positive indirect effect of reducing encroachment of trees and shrubs. Most shale barrens do not have continuous fuels that could carry a fire, so direct effects to shale barren rockcress from prescribed fires are unlikely.

Cumulative Effects

Potential cumulative effects to the species include deer herbivory, grazing on private land, competition from non-native invasive species, vulnerability of insect pollinators to Dimilin spraying for gypsy moth, and a variety of vegetation- and land-disturbing activities on private lands. MNF management in the vicinity of shale barrens likely would not involve grazing or any type of vegetation or land disturbance (except for possibly prescribed fire), so implementation of the revised Forest Plan would have little or no potential to contribute to these cumulative effects. Non-native invasive species are often tied to roads, trails, and ground-disturbing activities, all of which the MNF would strive to avoid in and near shale barrens; therefore, there is little or no potential for MNF activities to contribute to cumulative effects due to non-native invasives. MNF management could make a minor contribution to deer herbivory to the extent that management near occurrences creates edge habitats that facilitate an increase in the carrying capacity for deer. However, hunting is the primary tool used to manage actual deer population levels (Evans et al. 1999), and setting hunting regulations is the responsibility of WVDNR. Therefore, MNF management will not affect the primary factor influencing deer population levels and the potential for deer browse. Dimilin spraying for gypsy moth control could occur on an as-needed basis, and is difficult to analyze at the programmatic level. The MNF could contribute to regional spraying efforts to the extent that control is needed on NFS lands. Spraying for gypsy moth control has not occurred for several years because gypsy moth populations have been controlled naturally in recent years, but there is no guarantee that the current situation will persist. Any necessary control would be analyzed at the site-specific level, and it is likely that project-level Section 7 consultation would result in site-specific conservation measures to avoid impacts of spraying near shale barrens on NFS lands.

Determination of Effect

Due to protections contained in the revised Forest Plan, all MNF management activities would have very little potential to affect shale barren rockcress. The potential for adverse effects is discountable; therefore, for shale barren rockcress, a determination of **may affect, not likely to adversely affect** is made for the implementation of the revised Forest Plan.

Virginia Spiraea

Existing Condition and Habitat Present

Virginia spiraea was listed as threatened on June 15, 1990. A recovery plan was completed in November 1992. Critical habitat has not been designated.

Virginia spiraea is a clonal shrub found on damp, rocky banks of larger, high gradient streams. This shrub may also be found at the flood-scoured mouths of side streams, rocky isles, seasonally flooded side channels, and in shrub thickets between river and forest. The shrub may be found in either full sun or shade. However, a clone overtopped by other vegetation will eventually die, and the plant requires periodic disturbance, usually in the form of moderate flooding, to control competition (USFWS 1992b).

The known range of Virginia spiraea includes the mountainous portions of Virginia, West Virginia, North Carolina, Tennessee, and Georgia, in areas that drain to the Ohio River (pages 660-661 in Gleason and Cronquist 1991). USFWS (1992b) also notes extant occurrences in Ohio and Kentucky, and extirpated

occurrences from Pennsylvania and Alabama. Most occurrences range-wide are of poor quality and have low viability. It is estimated that there are fewer than 30 different genotypes range-wide (NatureServe accessed 3/31/04).

Within a watershed, occurrences potentially are connected along streams via water-borne seed dispersal or flood-dispersed vegetative fragments. Populations in different watersheds are isolated from each other. Connectivity could be important for the species' long-term viability because when clones from different localities are grown together, they fruit prolifically and produce viable seed (USFWS 1992b).

Habitat and Populations on the MNF - Elevation range for known occurrences in West Virginia is 1000 to 1800 feet. It is not known whether this represents a preference or is an artifact of the species' very limited distribution. Low elevations (less than 2500 feet) on the Forest are limited to the western part of the Cheat District, the eastern part of the Potomac District, the Tygart River valley, the Gauley River valley, and the southern end of the White Sulphur district. For this analysis, the banks of larger streams within these low-elevation areas are presumed to represent potential habitat for Virginia spiraea.

Within the Forest, there is one known element occurrence consisting of two subpopulations along the Greenbrier River at the southern edge of the White Sulphur District. Based on this information, the species appears to occupy only a small fraction of the potentially available habitat.

Threats - Because Virginia spiraea is primarily a shrub of the riparian ecotone between forested slopes and the rocky shores of high-energy rivers, the factors that most affect the species are those that either eliminate its habitat all together, or curtail the moderate level of flood-scouring it seems to require. It is thought that scouring reduces competition from native and non-native plants that would otherwise out-compete it. Recreational users may pose an additional threat by clearing riverside sites for fishing, camping and rafting. Large scouring floods, competition from native and non-native plant species, an apparent lack of successful sexual reproduction, and limited opportunities for colonization are threats as well (West Virginia Natural Heritage Program 1991). Currently, the biggest threat to West Virginia's populations may be ATV use (P. Harmon pers. comm. 1999). Some populations off the MNF have been detrimentally affected by ATV use. ATV use is not considered a threat on the MNF because the entire Forest currently is closed to ATV use.

Conservation Measures in the Revised Plan

Essentially all known and potential habitat for Virginia spiraea is protected by Forest-wide direction for stream channel management corridors (see effects discussion below). Because of this protection, the revised Forest Plan does not contain direction that specifically addresses Virginia spiraea. See the Soil and Water Resources section in Chapter II of the revised Forest Plan for detailed direction.

Direct and Indirect Effects

Because Virginia spiraea is limited to the riparian zone immediately adjacent to major streams, riparian protections contained in the revised Forest Plan direction would protect the species and its habitat from most impacts related to MNF management. Forest Plan direction would prohibit programmed timber harvest within stream channel buffers, which for streams the size of those that provide habitat for Virginia spiraea encompass areas 100 feet wide on both sides of the channel. Forest Plan direction for stream channel buffers also would eliminate negative effects on Virginia spiraea habitat due to skid trails and landings, hiking trails, recreational activity, mineral materials development, natural gas development, roads, crossing structures, firewood collection, wildlife habitat management, fire suppression, range management, and special uses (see direction in the Soil and Water Resources section of Chapter II of the revised Forest Plan). Direction for stream channel buffers generally allows exceptions for essential

crossings by linear features, but requires that negative effects to riparian resources be avoided, minimized, or mitigated. Because Virginia spiraea is quite rare and thus not likely to occur at very many crossing sites, and because project-level botanical surveys are a normal part of ESA Section 7 consultation, it is very likely that negative effects due to essential crossings would be avoided. Prohibiting most timber harvesting could remove a potentially beneficial source of canopy disturbance, but the revised Forest Plan Direction allows vegetation management in stream channel buffers when it is needed for TEP species management.

Indirect effects due to alteration of flooding regimes by timber harvests also appear unlikely to occur. Research shows that 20 to 30 percent of a watershed's basal area needs to be removed to cause a detectable increase in stream flow (Hornbeck et al. 1997, Hornbeck and Kochenderfer 2000; see discussion in the Watershed, Riparian, and Aquatic Resources section of EIS Chapter 3). Under the revised Forest Plan, no project is likely to include that level of timber harvest in a watershed the size of those that provide habitat for Virginia spiraea.

Gypsy moth control would not affect Virginia spiraea because reproduction is primarily asexual through clone or rhizome fragmentation and natural layering. Thus, effects to non-target pollinators would not be detrimental.

Cumulative Effects

If undiscovered populations of Virginia spiraea exist on non-NFS lands within the Forest boundary, cumulative effects could occur due to activities on non-NFS land such as land development, road construction, clearing for recreational use, timber harvest, mining, grazing, etc. Cumulative effects due to large scouring floods could occur on all land ownerships. Because of the riparian protections outlined above, MNF management is not expected to make a measurable contribution to these effects. Riparian protection measures will have a beneficial effect on individuals and habitat as these areas are protected from drastic, human-caused changes.

Determination of Effect

Due to the strong protections for riparian habitat contained in the revised Forest Plan, all potential negative effects due to MNF management activities are discountable. Therefore, for Virginia spiraea, a determination of **may affect, not likely to adversely affect** is made for the implementation of the revised Forest Plan.

Running Buffalo Clover

Existing Condition and Habitat Present

Running buffalo clover was listed as endangered on June 5, 1987. A recovery plan was completed in June 1989 (USFWS 1989). Critical habitat has not been designated for this species.

Running buffalo clover is a perennial herbaceous plant found in rich, fertile, semi-shaded habitats. RBC has a high affinity for calcium-rich soil. This plant has been found in open forests, lightly disturbed areas such as old logging roads, and old farmsteads and cemeteries. Little is known about the original vegetation with which running buffalo clover was associated (Ostlie 1990) or specific system processes and disturbance regimes under which this species existed. Existing RBC populations occur in floodplain forests, field edges (Bartgis 1985), savannas, old woods roads and skidder trails, grazed woodlots, mowed paths, wildlife openings within mature forests, weedy ravines (NatureServe 2005), mowed parks, and

hawthorn thickets (Cusick 1989). Natural populations do not occur in areas of full sun (Ostlie 1990). Many botanists believe RBC is a savanna species dependent on slight disturbance for survival. Evidence indicates RBC responds favorably to low levels of disturbance (NatureServe 2005).

RBC formerly grew over a broad area of West Virginia, Ohio, Kentucky, Indiana, Illinois, Missouri, Kansas, Nebraska, and Arkansas (Cusick 1989). Once widespread and commonly found along streams and bison trails, the species is now considered extirpated from much of its historical range (Ostlie 1990).

Habitat and Populations on the MNF - For the SVE conducted for the plan revision EIS, young and old successional stages of mixed mesophytic forests were used to estimate potential habitat. These features can only provide a rough approximation of RBC habitat, given the broad scale of the analysis and the limited data available on this species and its suitable habitat. For example, all of the old successional stage is not suitable habitat because not all of it is likely to have a broken canopy or the preferred limestone-derived soils. Likewise, the entire young mixed mesophytic forest habitat likely is not suitable because the canopy is completely open, or regeneration has progressed to the point that it is not open enough. Also, suitable habitat likely exists in the mature successional stage (not included in the estimate) because of partial disturbances of the canopy. Potential habitat is widespread and nearly contiguous across much of the Forest, but actual suitable habitat is limited to lightly disturbed areas. Such areas tend to be scattered, but the possibility of seed dispersal via deer (Pickering 1989) may serve to connect some patches.

West Virginia Natural Heritage Program records (unpublished) show 14 recent element occurrences within the MNF proclamation boundary, many of which consist of numerous subpopulations (USDA Forest Service unpublished data). Most occurrences are on the Cheat Ranger District and the western part of the Greenbrier Ranger District. Based on these data, the species appears to occur in a substantial minority of the potential habitat. Only three of the known occurrences are on private land. Forest Service occurrences are known, mapped, and can usually be protected from management actions, although lack of disturbance may be an issue for these occurrences.

Threats - Regional threats to RBC include: direct loss of habitat; reduced ground disturbance and permanent loss of disturbed woodlands along streams and terrace areas, habitat fragmentation, competition from non-native plants, and altered natural disturbance regimes (USDA Forest Service 2001). The clover may have been tied to disturbances made by large herbivores, particularly bison. With the elimination of large herbivores from the range of the clover, not only was the habitat lost but so were potential routes and mechanisms of dispersal (USFWS 1989). An additional threat that has caused decline is reduced fire frequency resulting in the loss of open woodlands (Ostlie 1990). Current knowledge indicates RBC needs slight disturbance to thrive, but the specific types and severity of disturbance are not well understood (Madarish and Schuler 2002).

Conservation Measures in the Revised Plan

Running buffalo clover is fairly widespread on the Forest, and it often occurs on old roads and other partly disturbed sites. Because it is often found in habitat that has been affected by past management, the revised Forest Plan does not contain specific provision to protect running buffalo clover from management activities. However, the management activities that are allowed by the revised plan could be viewed as conservation measures because they have the potential to maintain or enhance habitat. Botanical surveys typically are conducted as part of project planning. Any running buffalo clover occurrences discovered can be addressed by project-specific protection or habitat enhancement measures, as appropriate.

Direct and Indirect Effects

Effects from Mineral Operations - Federal mineral development may occur within RBC habitat, but development is not expected to be extensive (see Mineral Resources section of EIS Chapter 3). By far the major activity that could affect this species is disturbance related to gas development (well sites, roads, pipelines). On average, each well site is approximately 2 acres, with associated roads and pipelines that create narrow linear openings and ground disturbance, for a total of about 15.5 acres of disturbance per well. Effects could be both negative and positive. Negative effects could occur if individuals or populations are directly eliminated from the disturbance site; however, site-specific surveys prior to operations would greatly reduce this potential. Activities would also provide ground disturbance that could allow nearby populations to expand their numbers.

Development of privately-owned minerals beneath NFS lands is controlled by the deed. While the MNF would attempt to coordinate with private mineral owners and the USFWS to avoid or reduce impacts, the MNF generally has little authority over private mineral operations. Depending on the terms of the mineral severance deed, the MNF may have some discretion over the location of surface occupancy associated with private mineral developments. In such cases the MNF would encourage locations that avoid adverse impacts to running buffalo clover. The federal action would be limited to the MNF's authority, which may not include the effects of the mineral development itself. Therefore, any effects of private mineral development beyond those over which the deed allows MNF discretion are not analyzed as part of this federal action. ESA compliance for those effects would be the responsibility of the private mineral developer.

Effects from Range Activities – RBC habitat would not be increased or decreased by continued operation and maintenance of existing range allotments. Running buffalo clover is not known to occur on any of the existing allotments, although a few allotments are very close to known occurrences. Some existing allotments may include potential habitat if they include forested areas and are on soils derived from limestone. Development of new range allotments is expected to be limited to newly acquired land that is already pasture or hay land. Cattle paths may create habitat for RBC similar to pre-settlement conditions found on game trails. Should running buffalo clover occur on any range allotments, negative impacts could include excessive herbivory of RBC by cattle; positive impacts could include the spreading of seeds by livestock and maintenance of the disturbance patterns that enhance populations.

Effects from Fire-related Activities – The location, timing, and extent of fire suppression activities are difficult to predict. Effects could be both negative and positive. Negative effects could occur if individuals or populations are directly eliminated from the disturbance site. Activities would also provide ground disturbance that could allow nearby populations to expand their numbers. However, wildfire and fire suppression activities are currently at fairly low levels on the Forest, and they are not expected to increase dramatically over the short term. Therefore, the chance that suppression activity would affect occurrences of running buffalo clover is low.

Prescribed fire is allowed within most areas of the Forest. Site-specific burn plans would be completed at the project level for each burn, and these plans would be designed to minimize any potential adverse effects on running buffalo clover. Prescribed fire is currently limited to 300 acres per year by the Forest's Programmatic Incidental Take Statement for the Indiana bat, but the revised Forest Plan has an objective that would increase this amount by as much as tenfold. Potential direct effects to RBC could be both positive and negative. Fire line construction could remove individuals if surveys are not made before construction. However, surveys are a normal part of the ESA Section 7 consultation process, so it is likely that occurrences would be discovered and appropriate measures instituted as part of the burn plan. Positive effects could include re-introducing an ecosystem component that would create the open

conditions favored by RBC. However, there would likely be short term negative effects as individual plants might be killed by fire.

Prescribed fire activities are most likely to occur in areas with a fire regime of I or III and a condition class of 2 or 3. Within these high priority areas, objectives call for applying prescribed fire to about 5 to 15 percent of the acreage within the first decade of the planning horizon. Approximately 1,300 acres of potential RBC habitat is in fire regime I, condition class 3, and about 6,900 acres are in fire regime III, condition class 2, for a total of about 8,200 acres. These estimates include all MPs, including those where prescribed fire may not be used. The acres with potential for prescribed fire use make up about 24% of the total potential RBC habitat. If prescribed fire is applied to the same proportion of high priority land in primary range as in high priority areas on the whole Forest, the revised Forest Plan's objectives for prescribed fire could result in the treatment of 410 to 1,230 acres of RBC habitat during the first decade of the planning horizon. This amounts to approximately 1 to 4 percent of all the RBC habitat on NFS land.

Effects from Road-related Activities - Various road management activities (construction, reconstruction, decommissioning, and maintenance) could affect individuals, populations, or habitat since many of the known populations of RBC are found on roads. Effects could be both negative and positive. Negative effects could occur if individuals or populations are directly eliminated from the disturbance site; however, site-specific surveys prior to operations and monitoring of existing occurrences would greatly reduce this potential. Activities would also provide ground disturbance that could allow nearby populations to expand their numbers. In some cases, a short-term solution of driving around plant populations may be feasible depending on site conditions. Also, use of the road could be limited to limit the number of times a population is impacted. Negative impacts may be unavoidable if the road is needed for management access and construction of a new road would lead to unacceptable impacts to soils or aquatic resources. Negative impacts could also occur on roads where private landowners have a right to use a road where RBC is found. Individual RBC plants could be removed from the road bed in this instance to lessen the impacts.

Effects from Recreation Activities – Developed and dispersed recreation activities would not measurably affect RBC populations or habitat. No large-scale facility or trail development is planned for the foreseeable future. Although facilities are allowed in many areas, any development would be very small on a Forest-wide scale. Normal pre-project surveys would identify any occurrences and provide the opportunity to avoid negative effects. Facility and trail maintenance would not further alter existing habitat.

Effects from Watershed and Aquatic Habitat Restoration Activities - Soil and water restoration activities tend to occur in localized areas and would be preceded by site-specific surveys prior to project implementation. Any short-term effects from disturbance would be similar to those described for Road-related Activities, above. Because of the localized nature of watershed restoration activities and pre-project clearance surveys, it is likely that any negative effects would be avoided.

Effects from Salvage Activities – Timber salvage would occur only after areas have been already damaged or altered by natural disturbances. Effects would typically be minimal due to the relatively small scale of salvage operations on this Forest, and any activities would be preceded by site-specific surveys for T&E plants.

Effects from Wildlife Habitat Management - Wildlife opening or savannah establishment could eliminate individuals or populations from the disturbance site; however, site-specific surveys prior to operations would greatly reduce this potential. Potential effects from fire or harvest-related habitat treatments are covered elsewhere in this section. Fisheries habitat restoration activities would likely have no effect on RBC populations or habitat.

Since RBC needs disturbance to flourish, there are opportunities to enhance habitat. Actions such as mowing, tree girdling, or scarification of the surface, for example could be used to enhance RBC habitat. However, there may be short-term negative impacts to individuals because of these actions.

Effects from Timber Harvest Activities – Timber harvest would likely have the greatest potential for effects on RBC habitat due to the relatively widespread potential for ground disturbance and habitat manipulation, and due to the widespread nature of potential running buffalo clover habitat. Potential direct and indirect effects to RBC include loss of individuals and populations through road construction, timber harvest and associated developments (skid roads and landings for example). However, surveys for threatened, endangered, and sensitive plant species typically would be conducted in areas proposed for active management as part of ESA Section 7 consultation. Such surveys would provide the opportunity to avoid or minimize negative effects to running buffalo clover, and would also provide the opportunity to include habitat enhancement as part of the project. Most known populations of RBC on the MNF are associated with old, seldom used roads. If an older road in potential habitat is used for access, and RBC not surveyed for, individuals could be lost. RBC is somewhat resilient to disturbance in that pieces of plants will re-colonize a road after use; however, if use includes full reconstruction (addition of gravel, continued maintenance), potential habitat and individuals may be lost. Again, surveys for the plant before action would provide opportunities to avoid or minimize these effects, and could provide opportunities to enhance occupied habitat along old roads. It may not be possible to avoid all adverse effects in all cases. RBC is found on and along Forest Service System roads that may be used in the future for vegetation management. In these cases, some sites may be avoided by creating short sections of road to by-pass the individuals, or habitat enhancement could be used to create habitat off of the road surface.

Effects From Gypsy Moth Control – Like other *Trifolium* species, RBC is believed to be pollinated primarily by bees. Because Dimilin, Bt, and Gypchek target moths and butterflies, these sprays are not anticipated to affect bee populations within spray areas. Thus, effects to non-target pollinators would not be detrimental to RBC.

Effects From Firewood Cutting – The number of firewood permits and miles of open roads are limited, so the probability of affecting RBC by firewood cutting is discountable. Furthermore, some firewood cutting and gathering occurs when RBC is dormant. Therefore, firewood cutting is not likely to directly, indirectly, or cumulatively affect RBC.

Cumulative Effects

Effects to Habitat – Modeled projections predict a substantial increase in potential habitat for this species (young and old stages of mixed mesophytic forest) under the revised Forest Plan. This increase would be due to the general aging trend as most stands continue to mature, plus an increase in young stands due to harvesting to achieve age class diversity (see Terrestrial Ecosystem Diversity section of EIS Chapter 3). Similar trends are expected on private land as many stands continue to age there as well. Thus, the cumulative trend is an overall increase in potential habitat, with MNF management activities potentially contributing to a large portion of that increase. However, the extent to which the potential habitat will contain suitable microhabitat conditions, such as a broken tree canopy maintained by a moderate disturbance regime, is difficult to predict.

Effects to Individuals – Timber harvesting, associated road building, mineral development, and other activities that disturb the vegetation or soil have the potential to both negatively and positively affect population occurrences, as outlined above in the Direct and Indirect Effects section. Although the amount of harvesting projected for NFS lands likely would be a substantial fraction of all harvesting on all land ownerships in the Forest boundary, typical survey, avoidance or minimization of negative effects, habitat

enhancement, and monitoring procedures on NFS lands should provide adequate protection for any known or discovered populations. Therefore, management on NFS lands is not expected to make a substantial contribution to the cumulative negative effects of timber harvest and associated roads and facilities. The same survey and mitigation procedures apply to other vegetation and soil disturbing activities on NFS land, so MNF contributions to cumulative negative effects of other activities is expected to be minimal as well.

Potential cumulative effects to this species also include competition from non-native invasive species and altered natural disturbance regimes. While roads and other soil disturbance associated with timber harvest have the potential to facilitate the spread of non-native invasive plants, the revised Forest Plan contains direction to identify susceptible areas where extra precautions are necessary to prevent the spread of non-native invasive plants, to design projects in ways that reduce the potential for spread, and to use weed-free seed for all seeding. Therefore, the MNF's contribution to the cumulative negative effects of non-native invasive species is expected to be small compared to the contribution of private activities, which generally do not include any special measures to prevent the spread of non-native invasive species. Due to the revised Forest Plan's increased emphasis on use of prescribed fire for ecosystem restoration, MNF management is expected to combat the cumulative negative effects of altered natural disturbance regimes, rather than contribute to them.

Determination of Effect

All MNF management activities that involve disturbance to vegetation or soil have the potential for negative effects on running buffalo clover through the destruction of populations or habitat. Surveys for TEP plants and avoidance or minimization of impacts would reduce the likelihood and intensity of negative effects. However, since the species tends to occur on Forest roads and needs some disturbance for maintenance of habitat, negative effects cannot be considered insignificant or discountable. Many of the same vegetation- and soil-disturbing activities with the potential for negative impacts have the potential for beneficial effects because of their potential to create or maintain the slight levels of disturbance that seem to be preferred by this species. Individual plants may be negatively impacted while habitat is created allowing for expansion of a population as a whole. Therefore, for running buffalo clover, a determination of **may affect, likely to adversely affect** is made for the implementation of the revised Forest Plan.

SUMMARY OF DETERMINATIONS

In summary, based on the above effects analysis for species and habitat types, it is our professional opinion that implementing the revised Forest Plan:

1. **May affect, but is not likely to adversely affect the** Virginia big eared bat and its designated critical habitat, West Virginia northern flying squirrel, bald eagle, Cheat mountain salamander, small-whorled pogonia, shale barren rockcress, and Virginia spiraea.
2. **May affect, and is likely to adversely affect the Indiana bat.**
3. Will have **no effect** on designated critical habitat for the Indiana bat.
4. **May affect, and is likely to adversely affect running buffalo clover.**

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Appendix A

Crosswalk Relating Direction in the 2004 Threatened and Endangered Species Forest Plan Amendment to the Direction in the Revised Forest Plan

2004 T&E Amendment and 2005 Forest Plan Crosswalk

This document displays the management direction found in the T&E Amendment (2004) to the 1986 Forest Plan and shows how it was addressed or changed in Forest Plan Revision. Revision provided the opportunity to revisit the various layers of direction that were created for the 2004 T&E Amendment. After reviewing the Amendment direction, the FP revision team came to the conclusion that several aspects of this direction needed to be addressed or changed. These aspects are briefly described below.

1. The Amendment direction was written to be consistent and merge with the 1986 Plan; however, some language in the 1986 Plan direction is now considered to be obsolete. The way direction is used, and even the definitions of different pieces of direction, have changed in the last 20 years. Example: the 1986 Plan has essentially two types of direction, “general” and “standards/guidelines”. The concept of “general” direction is no longer used in Forest planning, and standards and guidelines are now clearly separated because they have different definitions and different legal and administrative implications. Another example: the word “will” when used in management direction is now considered ambiguous, and has largely been replaced by “shall” or “must” for standards and “should” for guidelines to help differentiate the two types of direction.
2. The revision team used Regional Guidelines to revise 1986 management direction (see attachment at the end of this document). These guidelines were based on law, regulations, planning documents, and consultation with planners around the country. They were designed to be consistent with both the 1982 and 2005 planning rules. They provide updated definitions of management direction, and they also describe guiding principles for developing management direction, including: (a) Plans should provide strategic, programmatic guidance, rather than project-level guidance, (b) They should focus on what needs to be done rather than how it is to be done, (c) Plans should maximize flexibility at the project level, (d) Plans should not repeat existing or high-level direction (laws, regulations, policies, directives, manuals, agreements), (e) Plans should integrate management direction across program areas. When Amendment direction was deleted, it was usually for one or more of these reasons.
3. The Amendment direction contained much repetition and redundancy, mostly because the same type of direction was being repeated for each species and/or opportunity area that represented species habitat. However, during alternative development and management prescription review, it was decided that opportunity and prescription areas were not the best way to address species-related habitat concerns, primarily because those habitats could continue to change (hopefully expand) as time goes by. Also, all Opportunity Areas on the Forest are now being replaced by more watershed-oriented management strategies. This change created an opportunity to combine Amendment direction for Opportunity Areas and species into Forest-wide direction and thereby reduce repetition.
4. There is a heavy emphasis on the word “protection” in the 2004 Amendment. Although the Forest Service is obligated to protect certain resources, including listed species and critical habitat under the ESA, we are also obligated to provide for species recovery through habitat maintenance, restoration, or improvement. We prefer to emphasize these aspects of resource management in plan revision—using terms like maintain, restore, or improve—rather than focusing on “protection”, a term that is typically used in our agency for law enforcement or fire-fighting. We cannot physically protect species from all potential harm that may come their way, but we can provide and possibly expand habitat to aid in their recovery, and employ strategies

like land allocation and management direction that can reduce disturbance to species and their habitats.

5. We found pieces of direction that were unclear, inconsistent, unnecessarily complex, or too vague. We tried to correct these problems to the best of our abilities, while retaining the intent behind the original direction. People involved in the Amendment process (Dan Arling, Linda Tracy, George Hudak, Melissa Thomas-VanGundy, Craig Stihler) were consulted to help identify that original intent. In some cases, we added direction to help clarify the intent, or to fill gaps we found in the original direction.

Overall, we feel that the revised direction is as strong as the Amendment direction, it is easier to understand and implement, and it provides a clearer picture of the desired conditions we would like to achieve. In fact, we have added a desired condition section, which was absent in the original version. Direction for TEP species is now located in one place, which makes it simpler to find and absorb, but we have also linked it to other critical resource direction found in the revised Plan.

The following acronyms are used liberally throughout this document:

- | | |
|--|--|
| FW = Forest-wide | SWRA = Soil, Water, Riparian, Aquatic |
| T&E = Threatened and Endangered | MOU = Memorandum of Understanding |
| S&G = Standard/Guideline | USFWS = US Fish and Wildlife Service |
| IB = Indiana Bat | WVDNR = WV Division of Natural Resources |
| VBEB = Virginia Big-Eared Bat | ESA = Endangered Species Act |
| WVNFS = WV Northern Flying Squirrel | MP = Management Prescription |
| TEP = Threatened, Endangered, and Proposed | |

T&E Amendment Direction	Draft Revised Forest Plan Direction/Rationale
<p>FW General – 2640 Stocking A. Exotic fish or wildlife species will not be transplanted to or within National Forest lands unless the transplanting is part of an endangered species program.</p> <p><i>Concern:</i> The FS does not transplant fish and we do not have the authority to prohibit transplanting of state-managed fish or wildlife on NFS lands. However, we do work with the WVDNR and USFWS to help them meet their objectives, and they work with us to help meet habitat and other objectives.</p>	<p>Replaced by FW TEP Species Goal TE03 - Work with USFWS, WVDNR, and other appropriate personnel to identify and manage habitat for TEP species.</p> <p>Replaced by FW Wildlife and Fish Guideline WF22 - Coordinate with WVDNR on their proposed introduction, reintroduction, stocking, or transplanting of native or desired non-native species.</p> <p><i>Rationale:</i> We do not want direction in our plan that is beyond the scope of our authority. This direction spells out our obligation to coordinate with WVDNR.</p>
<p>FW General – 2640 Stocking B. Trout stocking will be permitted within the National Forest.</p> <p><i>Concern:</i> The FS does not stock fish and we do not have the authority to permit or prohibit state fish stocking. Stocking is controlled by the state. We work with the state to help them meet their population objectives, and they work with us to help meet habitat objectives.</p>	<p>Replaced by FW Wildlife and Fish Guideline WF22 - Coordinate with WVDNR on their proposed introduction, reintroduction, stocking, or transplanting of native or desired non-native species.</p> <p><i>Rationale:</i> We do not want direction in our plan that is beyond the scope of our authority. This standard spells out our obligation to coordinate with WVDNR.</p>
<p>FW S&G – 2640 Stocking 1. No “put and take” stockings will be made in natural producing native brook trout waters, unless stream productivity is very low and cannot feasibly be improved. Stocking should favor native (brook trout) or naturalized</p>	<p>Replaced by FW Wildlife and Fish Guideline WF22 - Coordinate with WVDNR on their proposed introduction, reintroduction, stocking, or transplanting of native or desired non-native species.</p>

T&E Amendment Direction	Draft Revised Forest Plan Direction/Rationale
<p>fish species (rainbow or brown trout).</p> <p><i>Concern:</i> This direction may express our views on this subject but it is not under our authority to control.</p>	<p><i>Rationale:</i> We do not want direction in our plan that is beyond the scope of our authority. This standard spells out our obligation to coordinate with WVDNR.</p>
<p>FW S&G – 2640 Stocking</p> <p>2. Quality will be favored over quantity, and, in some instances, stocking numbers, sizes, and species may be manipulated to provide a quality experience and to protect the stream zone from environmental degradation.</p> <p><i>Concern:</i> This direction may express our views on this subject but it is not under our authority to control.</p>	<p>Replaced by FW Wildlife and Fish Guideline WF22 - Coordinate with WVDNR on their proposed introduction, reintroduction, stocking, or transplanting of native or desired non-native species.</p> <p><i>Rationale:</i> We do not want direction in our plan that is beyond the scope of our authority. This standard spells out our obligation to coordinate with WVDNR.</p>
<p>FW S&G – 2640 Stocking</p> <p>3. Stocking will be in accordance with the current Memorandum of Understanding between the Fish and Wildlife Service, Department of Interior, and the West Virginia Department of Natural Resources.</p> <p><i>Concern:</i> This Memorandum could change. If it doesn't, it's already in place and we have to follow it, so this direction is redundant and unnecessary.</p>	<p>Replaced by FW Wildlife and Fish Guideline WF22 - Coordinate with WVDNR on their proposed introduction, reintroduction, stocking, or transplanting of native or desired non-native species.</p> <p><i>Rationale:</i> This guideline addresses our obligation without tying it to a document that could change and thus require a Forest Plan amendment.</p>
<p>FW General – 2670 T&E Species</p> <p>A. Management will protect or enhance habitat for threatened and endangered species and consider the needs of species identified as special or unique.</p> <p><i>Concern:</i> The FS does not “protect” habitat so much as we provide or retain it through maintenance, restoration, or improvement of habitat conditions. Or, we have direction that prohibits or limits management activities to avoid or minimize effects on T&E species and their habitats. This direction is spelled out for individual species in the Plan.</p> <p>Also, the FS does not have any species we currently identify as “special or unique” but we may have proposed species that are not included here. To “consider the needs of...” is weak direction and should be replaced with something we intend to accomplish.</p>	<p>Replaced by FW TEP Species Goal TE01 - Provide habitat capable of contributing to the survival and recovery of species listed under the ESA. Provide habitat that may help preclude Proposed species from becoming listed.</p> <p>Replaced by FW Wildlife and Fish Goal WF01 – Provide habitat diversity that supports viable populations of native and desired non-native wildlife and fish species, including Management Indicator Species (MIS), and keeps RFSS from a trend toward federal listing.</p> <p>See also all standards and guidelines for individual species in the TEP Species section of FW direction.</p> <p><i>Rationale:</i> Goal TE01 says much the same thing as the 1986 direction but in a more positive and proactive statement about what we want to do and why. The vague statement about considering the needs of special or unique species is removed. Specific protections are provided by standards and guidelines for individual species and their habitats in the TEP Species section. Goal WF01 replaces the vague concept of special and unique species with RFSS and MIS.</p>
<p>FW S&G – 2670 T&E Species</p> <p>1. Management of habitat essential to threatened, endangered, and proposed species is considered the first priority management activity.</p> <p><i>Concern:</i> This direction implies, intentionally or not, that the ESA is more important or a higher priority than any of the other laws or regulations the FS must follow.</p>	<p>Deleted</p> <p><i>Rationale -</i> The courts may set legal precedence, but the FS does not have that authority. The entire suite of direction related to TEP species already suggests its relative importance without this potentially controversial statement.</p>
<p>FW S&G – 2670 T&E Species</p>	<p>Replaced by FW TEP Species Goal TE03 - Work with</p>

T&E Amendment Direction	Draft Revised Forest Plan Direction/Rationale														
<p>2. Forest personnel will work with State agencies and the U.S. Department of the Interior Fish and Wildlife Service (USFWS) in identifying habitat essential for threatened, endangered, and proposed species.</p> <p><i>Concern:</i> Minor wording changes recommended related to who we work with and why.</p>	<p>USFWS, WVDNR, and other appropriate personnel to identify and manage habitat for TEP species.</p> <p><i>Rationale:</i> We work with these agencies and other personnel (Dr. Pauley of Marshall U., for example) to identify and develop management/mitigation for habitat. This direction does not meet the definition of a standard. Also, deleting the word “essential” removes possible confusion with designated critical habitat. Most of the T&E species on the Forest do not have designated critical habitat; deleting the word “essential” clarifies that we intend to identify and manage habitat for T&E species, regardless of whether the habitat has any official status.</p>														
<p>FW S&G – 2670 T&E Species</p> <p>3. The requirements of approved Threatened and Endangered Species Recovery Plans and Biological Opinions issued by the USFWS for the MNF will be implemented and fully coordinated with the Forest Land Management Plan.</p> <p><i>Concern:</i> This direction restates obligations we already have through law, regulation, MOU, etc. It is also unclear what is meant by “The requirements... will be implemented and fully coordinated with the FLMP.” That could be interpreted to mean we have to revise our LRMP every time a recovery plan changes or is created.</p>	<p>Replaced by FW TEP Species Desired Conditions - Habitats for Threatened and Endangered Species are managed consistent with established and approved Recovery Plans.</p> <p><i>Rationale:</i> This meets the intent of the original S&G without directly tying the recovery plans to a Forest Plan standard and potential amendments. It also better describes what we want to do as an agency, as opposed to our legal obligation, which does not need to be restated here.</p>														
<p>FW S&G – 2670 T&E Species</p> <p>4. The U.S. Department of Agriculture Forest Service (USFS) will participate in the development of recovery plans for all threatened, endangered, and proposed species.</p> <p><i>Concern:</i> Minor wording changes recommended related to the scope of our obligation.</p>	<p>Replaced by FW TEP Species Goal TE03 - Participate in recovery plan development for threatened or endangered species that occur on the Forest, or that may be influenced by Forest management activities.</p> <p><i>Rationale:</i> We do not need to participate in recovery plan development for all T&E species, just those that have suitable habitat on or near our Forest. The reference to proposed species was deleted because proposed species do not have recovery plans.</p>														
<p>FW S&G – 2670 T&E Species</p> <p>5. The following federally listed threatened and endangered species are known to occur or may occur on the MNF:</p> <table border="0"> <tr> <td>Bald eagle</td> <td><i>Haliaeetus leucocephalus</i></td> </tr> <tr> <td>Cheat Mountain salamander</td> <td><i>Plethodon nettingi nettingi</i></td> </tr> <tr> <td>Eastern cougar (considered extirpated)</td> <td><i>Puma concolor cougar</i></td> </tr> <tr> <td>Indiana bat</td> <td><i>Myotis sodalis</i></td> </tr> <tr> <td>Virginia big-eared bat</td> <td><i>Corynorhinus townsendii virginianus</i></td> </tr> <tr> <td>West Virginia northern flying squirrel</td> <td><i>Glaucomys sabrinus fuscus</i></td> </tr> <tr> <td>Running buffalo clover</td> <td><i>Trifolium stoloniferum</i></td> </tr> </table>	Bald eagle	<i>Haliaeetus leucocephalus</i>	Cheat Mountain salamander	<i>Plethodon nettingi nettingi</i>	Eastern cougar (considered extirpated)	<i>Puma concolor cougar</i>	Indiana bat	<i>Myotis sodalis</i>	Virginia big-eared bat	<i>Corynorhinus townsendii virginianus</i>	West Virginia northern flying squirrel	<i>Glaucomys sabrinus fuscus</i>	Running buffalo clover	<i>Trifolium stoloniferum</i>	<p>Deleted</p> <p><i>Rationale:</i> This is not direction, just a list. It does not meet the definition of a standard or guideline, and we do not want to have to amend the plan every time the list of species changes. Current and future listed species are covered generically in the Plan. We need to separate out information from actual direction (see Regional Guidelines for Writing Management Direction).</p>
Bald eagle	<i>Haliaeetus leucocephalus</i>														
Cheat Mountain salamander	<i>Plethodon nettingi nettingi</i>														
Eastern cougar (considered extirpated)	<i>Puma concolor cougar</i>														
Indiana bat	<i>Myotis sodalis</i>														
Virginia big-eared bat	<i>Corynorhinus townsendii virginianus</i>														
West Virginia northern flying squirrel	<i>Glaucomys sabrinus fuscus</i>														
Running buffalo clover	<i>Trifolium stoloniferum</i>														

T&E Amendment Direction	Draft Revised Forest Plan Direction/Rationale
<p>Shale barren rock cress <i>Arabis serotina</i> Small whorled pogonia <i>Isotria medeoloides</i> Virginia spiraea <i>Spiraea virginiana</i></p> <p><i>Concern:</i> This is not really direction. This is just a list of species that we will likely change over time.</p>	
<p>FW S&G – 2670 T&E Species 6. The official list of threatened, endangered, and proposed species is maintained by the USFWS. Any future changes to the official list will replace the list shown here.</p> <p><i>Concern:</i> This if more of a disclaimer than direction.</p>	<p>Deleted</p> <p><i>Rationale:</i> Again, this may be important information, but it is not Plan direction, and we are deleting the list for reasons stated above.</p>
<p>FW S&G – 2670 T&E Species 7. Avoid activities in known threatened, endangered, and proposed species populations and occupied habitat unless such activities are consistent with the standards for threatened, endangered, and proposed species.</p> <p><i>Concern:</i> This does not have to be said, as activities must follow Forest Plan standards, including those for TEP species. On one hand, this direction is more restrictive than it needs to be. The ESA provides options to avoid or minimize the effects of actions that may adversely impact listed species or habitat. But this standard would avoid all activities up front without assessing the potential impacts. This could be unintentionally and unnecessarily constraining to all sorts of relatively harmless activities. On the other hand, this direction may not be restrictive at all. The way this is written, any activity could proceed as long as it meets the standards for TEP species, regardless of what effects it may have on those species.</p>	<p>Deleted</p> <p><i>Rationale:</i> This direction is unnecessary, as it is just restating the intent of ESA but not completely accurately. Also, the standards and guidelines in the revised Plan TEP Species section describe the types or intensities of activities that would be avoided or minimized relative to TEP species and their habitats.</p>
<p>FW S&G – 2670 T&E Species 8. When activities are proposed in areas with a likelihood of occurrence for threatened, endangered, and proposed species, take one of the following actions:</p> <ul style="list-style-type: none"> a. Redesign the proposed action to avoid the area, or b. Conduct on-site surveys, as appropriate, to establish presence or absence of threatened, endangered, or proposed species. If threatened, endangered, or proposed species are not found, the action may proceed; if they are found, actions will be dropped or designed to avoid adverse effects to threatened, endangered, and proposed species, or <p>Assume potential presence of threatened, endangered, and proposed species and proceed with action if appropriate mitigation or beneficial measures can be implemented, or</p> <p>In rare instances where adverse effects to threatened, endangered, and proposed species cannot be</p>	<p>Deleted</p> <p><i>Rationale:</i> The options contained in this direction could be interpreted and applied differently by different line officers. And the emphasis is once again on avoidance, which may not be possible or practical in all cases. Also, the direction is not comprehensive in that it does not cover all of the potential management situations that may occur. One obvious reason is that the direction options are triggered by likelihood of occurrence rather than an assessment of whether proposed actions would have an adverse effect on species or habitat that may occur, which is the ultimate measurement we should be applying. Therefore, instead of using this incomplete direction, or trying to make it more comprehensive by adding more information on survey, project design, and consultation processes, we felt it would be prudent to delete this and follow existing consultation processes outlined in USFWS’s regulations and policy guidance and in the Forest Service Manual.</p>

T&E Amendment Direction	Draft Revised Forest Plan Direction/Rationale
<p>avoided, the Forest will request formal consultation with the USFWS</p> <p><i>Concern:</i> This would appear to be a sort of flowchart methodology for project implementation and formal consultation in TEP habitat. There are so many options here that the potential may be high for confusion and inconsistent application. Item b seems to state that adverse effects to T&E species are never allowed. Conversely, item c could be interpreted as suggesting that we can apply mitigation to activities that have an adverse effect and proceed without formal consultation. Such an approach would violate ESA regulations, which state that federal agencies must consult formally with USFWS for all activities that are likely to have any adverse effect on T&E species, even if beneficial effects outweigh the adverse effects. Also, all the options are not covered. For instance, what do we do with activities in TEP species habitat that are not likely to adversely affect the species? Perhaps the most important concern is that this direction appears to be restating or modifying procedures for Section 7 consultation that are already articulated in USFWS’s regulations and policy guidance and in the Forest Service Manual.</p>	
<p>FW S&G – 2670 T&E Species</p> <p>9. Areas of influence will be identified for all threatened, endangered, and proposed species or populations to assist in their recovery. All threatened and endangered species’ areas of influence will be managed via Forest-wide threatened and endangered species’ standards, but the areas of influence of the following species also will be managed under specific Management Prescription and Zoological standards:</p> <p><i>Concern:</i> The first sentence is confusing because some AOIs have obviously already been identified. The second sentence may not be accurate, because we no longer have zoological or 6.3 standards in the Revised Plan. We do not need to say that FW direction applies to AOIs.</p>	<p>Deleted</p> <p>Replaced by FW TEP Species Goal TE03 - Work with USFWS, WVDNR, and other appropriate personnel to identify and manage habitat for TEP species.</p> <p><i>Rationale:</i> The direction as written is somewhat confusing and inaccurate. The “areas of influence” and other key habitat features have already been written into the direction for individual species. To describe them separately is unnecessary and does not meet the definition of Forest Plan direction. Also, due to lack of information on specific habitat needs, we may not identify AOIs for all TEP species. Finally, applying the formal-sounding title “Area of Influence” could cause confusion with critical habitat designated by the USFWS.</p>
<p>FW S&G – 2670 T&E Species</p> <p>a. The area of influence for Virginia big-eared bat is recognized as identified summer colonies, hibernation sites, corridors, and foraging/roosting areas (6 miles in radius from hibernacula and summer colonies). Identified summer colonies, hibernation sites, and corridors will be managed under MP 8.0 and Zoological Area standards for Opportunity Area 837. Forest-wide, MP 8.0, and Zoological standards for OA 837 will be used to manage Virginia big-eared populations.</p> <p><i>Concern:</i> This is information, not direction. Terminology: summer colonies should be <i>maternity and bachelor colonies</i>, hibernation sites should be</p>	<p>Deleted</p> <p><i>Rationale:</i> The areas of influence and other important habitat features have been incorporated into the revised Forest Plan direction. Any separate description is thus unnecessary, is not really direction, and could be interpreted as a substitute for critical habitat.</p>

T&E Amendment Direction	Draft Revised Forest Plan Direction/Rationale
<p><i>hibernacula</i>. The last two sentences no longer apply because we have done away with zoological opportunity areas.</p>	
<p>FW S&G – 2670 T&E Species b. The area of influence for Indiana bats is recognized as four distinct areas - maternity sites, hibernacula, key areas, and the primary foraging, roosting, and swarming areas (hereinafter referred to as the primary range) of Indiana bats on the MNF. Maternity sites, hibernacula and key areas of Indiana bats will be assigned to MP 8.0, Opportunity Area 838; and primary range will be assigned to MP 6.3. Forest-wide, MP 6.3, MP 8.0, and Zoological standards for OA 838 will be used to manage Indiana bat populations.</p> <p><i>Concern:</i> This is information, not direction. The last two sentences will no longer apply because we have converted MP 6.3 and zoological opportunity areas to Forest-wide direction.</p>	<p>Deleted</p> <p><i>Rationale:</i> The areas of influence and other important habitat features have been incorporated into the revised Forest Plan direction. Any separate description is thus unnecessary, is not really direction, and could be interpreted as a substitute for critical habitat.</p>
<p>FW S&G – 2670 T&E Species c. The area of influence for West Virginia northern flying squirrels is recognized as their suitable habitat as defined by the updated Appalachian Northern Flying Squirrels Recovery Plan and will be assigned to MP 8.0, Opportunity Area 832. Forest-wide, MP 8.0, and Zoological standards for OA 832 will be used to manage West Virginia northern flying squirrel populations.</p> <p><i>Concern:</i> This is information, not direction. The information about OA 832 will no longer apply if we do away with zoological opportunity areas.</p>	<p>Deleted</p> <p><i>Rationale:</i> The areas of influence and other important habitat features have been incorporated into the revised Forest Plan direction. Any separate description is thus unnecessary, is not really direction, and could be interpreted as a substitute for critical habitat.</p>
<p>FW S&G – 2670 T&E Species 10. Areas of influence will be based on known populations and results of on-site surveys. They are intended to be dynamic and based on the most current scientific information for a given species.</p> <p><i>Concern:</i> Again, this is information, not direction. And this information says that AOIs are intended to be dynamic, which means they will change, and the Plan will therefore have to change with them.</p>	<p>Deleted</p> <p><i>Rationale:</i> See rationale for #9, above. Adaptive management can be used to adjust the Plan if needed to incorporate new and important information about TEP species or their habitats. However, we do not want to have to amend the plan based on the results of every on-site survey. We can adjust habitat maps instead.</p>
<p>FW S&G – 2670 T&E Species 11. Determine and implement appropriate habitat management techniques to maintain or enhance populations of threatened, endangered, and proposed species.</p> <p><i>Concern:</i> Need to say when or how we are going to do this, and focus on providing habitat rather than enhancing populations, which we may or may not influence. Also, this is written more as a goal or objective than S&G.</p>	<p>Replaced by FW TEP Species Goal TE04 - Within watershed-level planning units, identify TEP species habitat and opportunities to maintain, restore, or enhance habitat conditions. Design and implement management actions at the project level to address opportunities and provide for ecological conditions, population viability, reproductive needs, and habitat components for TEP species.</p> <p><i>Rationale:</i> This version better describes what we will do, and how and why we will do it. It also focuses more on habitat, which we know we can influence, rather than populations, which we may or may not be able to</p>

T&E Amendment Direction	Draft Revised Forest Plan Direction/Rationale
	influence. And it is better stated as a goal that we want to proactively achieve than a standard that we must meet or cannot exceed.
<p>FW S&G – 2670 T&E Species 12. Projects will consider as needed, ways of minimizing or eliminating threats to threatened, endangered, and proposed species due to non-native invasive species.</p> <p><i>Concern:</i> If there is an existing or potential threat to TEP species in the project area, the project already has to incorporate that threat into the analysis required by ESA. However, this direction does not make a specific link between the actual project and the threat. Rather it generically implies, in a somewhat ambiguous way, that any project will minimize any threat from NNIS to any TEP species. “Consider” means to think about, not necessarily act.</p>	<p>Replaced by FW TEP Species Goal TE04 - Within watershed-level planning units, identify TEP species habitat and opportunities to maintain, restore, or enhance habitat conditions. Design and implement management actions at the project level to address opportunities and provide for ecological conditions, population viability, reproductive needs, and habitat components for TEP species.</p> <p><i>Rationale:</i> Threats from all sources are addressed by this over-arching goal to identify and implement proactive measures to maintain and enhance TEP species habitat.. Also, we have created a new NNIS section in the FW direction for vegetation that should help address threats to TEP species and other resources.</p>
<p>FW S&G – 2670 T&E Species 13. Additional Forest-wide standards to address the specific needs of threatened, endangered, and proposed species are identified below.</p> <p><i>Concern:</i> This is information, not direction. Wording changes are needed for clarification.</p>	<p>Change to Information Link Rather than Direction - Additional Forest-wide direction to address the needs of specific threatened, endangered, and proposed species is identified below.</p> <p><i>Rationale:</i> All of the pieces of direction that follow are not necessarily “standards”. We kept this statement with slightly different wording as an information link, but it is not identified as any particular type of direction.</p>
<p>FW S&G – 2670 T&E Species a. Peregrine Falcon</p> <p><i>Concern:</i> Peregrines have been de-listed and therefore do not belong in the TEP section.</p>	<p>Moved to Wildlife Section under Sensitive Species</p> <p><i>Rationale:</i> Peregrines will likely be a Regional Forester Sensitive Species during the planning period. Peregrine direction is now in the FW Wildlife and Fish section.</p>
<p>1. The Forest will cooperate in the peregrine falcon restoration program by stocking 10 active pairs after inventorying and evaluating potential habitat, and prohibiting public intrusion on cliffs where the falcon has been introduced. The following standards will apply:</p> <p><i>Concern:</i> Do not really need this anymore because the WVDNR has already completed the stocking/hacking site program with USFWS.</p>	<p>Deleted</p> <p><i>Rationale:</i> The restoration program was completed, and the Forest has only been able to sustain one active pair, and that nest site is only used intermittently.</p>
<p>a) 0-5 chains from nest site. Land uses will be prohibited between February 1 and August 30, except for actions necessary to protect nest sites. Restrictions will also apply to rock climbers and hikers.</p>	<p>See FW Direction for Peregrine, Below</p>
<p>b) 5-10 chains from nest site. Land uses will not be permitted except those activities which do not make significant changes in the landscape. Permitted activities include thinning, maintenance of permanent openings, pruning, etc. Restrictions will apply yearlong. Clearcutting, land clearing and construction activity will be permitted in this zone during the period September 1 to January 30, in years following a successful stocking and breeding pair establishment, if a review by foresters</p>	<p>Replaced by FW Wildlife and Fish Goal WF01 - Provide habitat diversity that supports viable populations of native and desired non-native wildlife and fish species, including Management Indicator Species (MIS), and keeps RFSS from a trend toward federal listing.</p> <p>Replaced by FW Wildlife and Fish Goal WF02 - Manage human-caused disturbances to help protect wildlife and fish populations during critical life stages.</p>

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<p>and biologists concurs with the proposed treatment.</p> <p><i>Concern:</i> These chain-based standards are outmoded and too specific for our current situation.</p>	<p>Replaced by FW Wildlife and Fish Guideline WF19 - Activities with the potential for causing adverse effects should be avoided or mitigated to the extent possible within ½ mile of active peregrine falcon nests. Seasonal closure orders may be used to control human disturbance in the vicinity of peregrine falcon nests.</p> <p><i>Rationale:</i> The only known nest site is within the NRA, and that has not been active recently. Recreation activity is the main potential threat in this area, and recreation effects can vary widely, so we needed fairly flexible direction to address them. The ½ mile zone is more consistent with recent peregrine management guidelines than the 5 to 10 chain zones used in the 1986 plan.</p>
<p>c) 10-20 chains from nest site. Land uses are permitted in this zone yearlong, except blasting should be restricted to the September 1 to January 30 period.</p>	<p>See FW Direction for Peregrine, Above</p>
<p>d) Over 20 chains from nest site. No constraints on management during any time of year.</p>	<p>See FW Direction for Peregrine, Above</p>
<p>MP and OA S&G – IB, VBEB, WVNFS External Relations</p> <p>1. Project activities in these areas will require consultation with USDI, Fish and Wildlife Service (USFWS). WVDNR will be kept informed of activities.</p> <p><i>Concern:</i> Formal consultation requirements dictated by the ESA and its implementing regulations apply Forest-wide wherever there is the potential for an adverse effect on a listed species. The procedures for consultation have already been established by the ESA and do not need to be repeated in the Forest Plan. This standard restates the consultation requirement in a way that could be interpreted as meaning the Forest has to consult on all activities in certain areas, regardless of the potential for adverse effects.</p>	<p>Replaced by FW TEP Species Goal TE03 - Work with USFWS, WVDNR, and other appropriate personnel to identify and manage habitat for TEP species. Participate in recovery plan development for threatened or endangered species that occur on the Forest, or that may be influenced by Forest management activities.</p> <p>FW Direction Introduction; Consultation, Cooperation, and Coordination section; TEP Species - Although all Threatened, Endangered, or Proposed (TEP) species on the Forest may not be individually addressed in the Forest Plan management direction, the Forest is obligated to provide sufficient habitat to contribute to their survival and recovery. This obligation is spelled out in more detail in the Endangered Species Act, FSM and FSH direction, and various recovery plans, conservation strategies and agreements, and MOUs. In addition, the Forest consults with the U.S. Fish and Wildlife Service at the project level for all proposed actions that may affect these species or their habitats.</p> <p><i>Rationale:</i> This direction addresses our consultation requirement at the FW level so we do not have to repeat it for each individual species under MPs or OAs that may not exist with Forest Plan revision.</p>
<p>None</p>	<p>FW TEP Species Goal TE02 - Integrate TEP habitat management with other resource objectives.</p> <p><i>Rationale:</i> The ESA and the Forest Service recognize that federal actions, and public activities on federal lands, can and will have some impacts on TEP species and their habitats. The challenge is to minimize those impacts where they cannot be avoided and still achieve other management objectives that are mandated by federal law</p>

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<p>None</p>	<p>and Congressional funding.</p> <p>FW TEP Species Goal TE04 - Within watershed-level planning units, identify TEP species habitat and opportunities to maintain, restore, or enhance habitat conditions. Design and implement management actions at the project level to address opportunities and provide for ecological conditions, population viability, reproductive needs, and habitat components for TEP species.</p> <p><i>Rationale:</i> Provides needed direction for proactively maintaining, restoring, or improving habitat for TEP, rather than focusing solely on protection and mitigation.</p>
<p>FW S&G – 2670 T&E Species - VBEB</p> <p>1) Identified summer colonies, hibernation sites, and corridors will be managed under MP 8.0 and Zoological Area standards for Opportunity Area 837. Foraging habitat will be managed under Forest-wide standards.</p> <p><i>Concern:</i> This statement is no longer accurate with the conversion of these Zoological Opportunity Areas to Forest-wide direction that applies wherever these habitat features occur.</p>	<p>Deleted</p> <p><i>Rationale:</i> Opportunity Area 837 no longer exists in the Revised Plan. This direction to follow other direction is no longer needed because all the direction for VBEB has been moved to the Forest-wide TEP Species section in the Revised Plan.</p>
<p>FW S&G – 2670 T&E Species - VBEB</p> <p>2) Before taking any actions on buildings that are within 6 miles of Virginia big-eared bat hibernacula or summer colonies, evaluate their potential to serve as roosting habitat and apply management protections as necessary.</p> <p><i>Concern:</i> Need to clarify that building may be disposed of under conditions that don't pose a threat to the bat.</p>	<p>Replaced by FW TEP Species Standard TE11 - Before taking actions on buildings that are within 6 miles of hibernacula, maternity colonies, or bachelor colonies, evaluate the buildings' potential to serve as roosting habitat and apply mitigation as necessary. Actions (disposal, construction, reconstruction, etc.) are allowed during the hibernation period (November 16–March 31) without roosting habitat evaluation.</p> <p><i>Rationale:</i> Allows for activities to occur when there is no threat to roosting bats.</p>
<p>FW S&G – 2670 T&E Species - VBEB</p> <p>3) A forested travel corridor of 330 feet wide will be protected between cave entrances and foraging areas. In travel corridors, the objective is to maintain or create an unbroken Forest canopy. Use of pesticides will be limited in the corridor.</p> <p><i>Concern:</i> This is older direction that has since become outmoded with new information about this species' habitat use. The species is now known to forage in a wide variety of open and forested habitats in both upland and riparian situations, rendering the identification of specific foraging areas obsolete. An unbroken forest canopy is no longer believed to be necessary. Also, it is unclear what is meant by "limited" use of pesticides.</p>	<p>Replaced by a number of FW Standards that limit management activities within 200 feet of hibernacula, including TE12, TE16, TE17, TE18, TE19, and TE20.</p> <p><i>Rationale:</i> Sufficient protection is provided by new direction for VBEB, particularly hibernacula standards. Pesticide use is covered Forest-wide for TEP species and would be analyzed on a case-by-case basis. Potential effects to TEP species would be avoided or minimized, and consulted on, which could result in site-specific restrictions on pesticide use.</p>
<p>FW S&G – 2670 T&E Species - VBEB</p> <p>4) Burn plans for prescribed fires will be developed to ensure adverse effects to Virginia big-eared bats are avoided.</p>	<p>Replaced by FW Fire Management Standard FM12 - A prescribed burning plan must be prepared and approved prior to using prescribed fire as a management tool. The plan shall address protection or maintenance of TEP species and habitat, cultural resources, watershed</p>

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<p><i>Concern:</i> This is really a Forest-wide TEP issue. Also, the wording makes it sound like we will have prescribed fires and burn plans specifically to avoid adverse effects to VBE bats.</p>	<p>resources, air quality, private property, and other resources or investments as needed or appropriate.</p> <p><i>Rationale:</i> Revised FW version covers all TEP species and clarifies that mitigation for TEP species or habitats may be needed or appropriate in any burn plan.</p>
<p>FW 2670 T&E Species – Species Subtitle c. Indiana Bat</p> <p><i>Opportunity:</i> Add Area of Influence feature links to glossary here to provide definitions related to direction that follows.</p>	<p>FW TEP Species – Species Subtitle, Indiana Bat -</p> <p>Added the links to glossary, which is currently part of the DEIS. We intend to have the same glossary in the Revised Plan for the final.</p>
<p>FW S&G – 2670 T&E Species – Indiana Bat</p> <p>1) Hibernacula, maternity sites, and key areas of the Indiana bat will be managed under MP 8.0 and Zoological Area standards for Opportunity Area 838. The primary range of the Indiana bat will be managed under Management Prescription 6.3 direction and standards. The following standards will also be used to manage these areas.</p> <p><i>Concern:</i> This statement is no longer applicable with the conversion of Zoological Opportunity Areas and MP 6.3 to Forest-wide direction. It is very confusing to put this information in the midst of direction that is supposed to be applied Forest-wide.</p>	<p>Deleted</p> <p><i>Rationale:</i> This direction to follow other direction is no longer needed because all Indiana bat direction has been moved to the Forest-wide TEP Species section in Forest Plan revision. This will allow us to apply the direction wherever Indiana bats occur in the future without having to amend the Plan.</p>
<p>FW S&G – 2670 T&E Species – Indiana Bat</p> <p>2) Each year, report quarterly to the USFWS the cumulative amount of acres involved in tree removal and prescribed burning.</p> <p><i>Concern:</i> This is already required by the T&E Amendment Biological Opinion.</p>	<p>Deleted</p> <p><i>Rationale:</i> No need to repeat direction that is already required. The Forest Biologists are well aware of this requirement.</p>
<p>FW S&G – 2670 T&E Species – Indiana Bat</p> <p>3) Retain all shagbark hickory trees in cutting units except where public safety concerns exist.</p> <p><i>Concern:</i> Need to incorporate safety of workers operating in harvest units, particularly around helicopters. There also may be opportunities for research into how bats or other wildlife use these habitat features.</p>	<p>Rewrote as FW TEP Species Standard TE21 -</p> <p>Retain all shagbark hickory trees in harvest units except where public or worker safety concerns or research opportunities exist.</p> <p><i>Rationale:</i> Incorporates safety of workers in harvest units and research opportunities.</p>
<p>FW S&G – 2670 T&E Species – Indiana Bat</p> <p>4) Monitor snag retention in cutting units. If an average of less than 6 snags/acre with 9” dbh or greater exists, manually create additional snags.</p> <p><i>Concern:</i> Need to clarify when and how many snags would be created. Need to incorporate public or worker safety concerns. Need to incorporate prioritization for retention.</p>	<p>Rewrote and expanded as FW TEP Species Standard TE22 -</p> <p>After post-harvest treatments, retain an average of at least 6 snags per acre that are 9 inches in diameter at breast height (dbh) or greater within harvest units, except where public or worker safety concerns exist. Create additional snags, if needed, from the available leave trees to make up any difference. Prioritize snag retention and creation from the largest to the smallest dbh.</p> <p><i>Rationale:</i> Clarifies that snag creation would occur after treatments, with a minimum target of 6 snags per acre. Incorporates safety issues and adds prioritization for snag retention.</p>

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<p>FW S&G – 2670 T&E Species – Indiana Bat 5) Protect all known roost trees on the MNF until such time as they no longer serve as roost trees (e.g. lose their exfoliating bark or cavities, fall down, or decay).</p> <p><i>Concern:</i> We may not be able to “protect” all trees from insects, disease, lightning, etc., but we can keep from cutting them down or burning them up on NFS land. We also need to recognize that roost trees may no longer serve as roost trees simply because the bats quit using them as such.</p>	<p>Rewrote as FW TEP Species Standard TE23 -Retain all known roost trees until such time as they no longer serve as roost trees (e.g. lose their exfoliating bark or cavities, fall down, decay, or are no longer used by bats).</p> <p><i>Rationale:</i> This wording gives us a little more flexibility for managing these trees on lands that we administer, while still capturing the original intent. However, the draft revised standard has a potential problem as written. Bats switch roost trees frequently, so it may not be possible to determine if a roost is “no longer used by bats.” Therefore, we intend to drop this phrase in the final version of the plan.</p>
<p>FW S&G – 2670 T&E Species – Indiana Bat 6) Where evidence of possible maternity colonies (lactating females or juveniles prior to August 15) is discovered, a temporary 3-year, 2-mile radius buffer will be established around the discovery site. Continue to search for actual maternity colonies within a 2-mile radius of the site using mist netting, and radio telemetry if feasible. Continue this search for a period of 3 years following the discovery, or until a maternity site is confirmed, whichever occurs sooner.</p> <p><i>Concern:</i> This is a little wordy as written. Need to rewrite for clarity. Don’t need to describe methods.</p>	<p>Rewrote as FW TEP Species Standard TE24 - Where evidence of maternity colonies (lactating females or juveniles prior to August 15) is discovered, search for actual maternity colonies within a 2-mile radius of the site. Continue this search for 3 field seasons, or until a maternity site is confirmed, whichever occurs sooner.</p> <p><i>Rationale:</i> Rewrote for clarity. Dropped methods, as they could change and there is no need to limit the search methodology flexibility.</p>
<p>FW S&G – 2670 T&E Species – Indiana Bat 7) If monitoring activities result in the discovery of maternity sites on the MNF, roost trees used by a maternity colony will be protected by establishing a zone centered on the maternity roost site. This zone would be assigned to MP 8.0 and Opportunity Area 838. This zone would be managed under Forest-wide, MP 8.0, and Zoological Area standards for OA 838. The actual area, not to exceed a 2-mile radius around the colony, will be determined by a combination of topography, known roost tree locations, proximity of permanent water, and a site-specific evaluation of the habitat characteristics associated with the colony. Protective measures shall be determined at a site-specific level by developing a management strategy in cooperation with the USFWS and the WVDNR using the best available scientific information.</p> <p><i>Concern:</i> Need to delete references to Opportunity and Zoological Areas as they have been converted to Forest-wide direction.</p>	<p>Rewrote as FW TEP Species Standard TE25 - If a maternity site is discovered, establish a buffer centered on the site. The buffer, not to exceed a 2-mile radius, shall be determined by a combination of topography, known roost tree locations, proximity of permanent water, and a site-specific evaluation of the habitat characteristics associated with the colony. Protective measures for potential or confirmed maternity colonies shall be determined at a site-specific level in cooperation with USFWS and WVDNR.</p> <p><i>Rationale:</i> Maternity sites could be discovered by other means than monitoring. Unwanted references to old Opportunity and Zoological Areas needed to be deleted. Simplified the wording for easier understanding.</p>
<p>FW S&G – 2670 T&E Species – Indiana Bat 8) If any new Indiana bat hibernacula are discovered, the MNF shall develop an appropriate protection plan, which could include signs, fences, or gates.</p> <p><i>Concern:</i> Need to clarify that these are hibernacula found on the Forest, where we can apply proper mitigation. The</p>	<p>Rewrote as FW TEP Species Standard TE26 - If any new Indiana bat hibernacula are discovered on the Forest, the Forest shall develop appropriate protection measures in cooperation with USFWS and WVDNR. These measures could include signs, fences, or gates.</p> <p><i>Rationale:</i> Minor clarifications. Added USFWS and</p>

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term “protection plan” could be interpreted to mean a lengthy document, which may not be necessary.	WVDNR cooperation. Deleted the reference to a “protection plan” and focused instead on developing protective measures.
<p>FW S&G – 2670 T&E Species – Indiana Bat 9) In addition to those projects allowed under the programmatic incidental take statement, specific projects may proceed without <u>formal</u> consultation if implemented during the <u>hibernation</u> period.</p> <p><i>Concern:</i> This is repeating direction in FW BO for T&E Amendment that we already have to follow.</p>	<p>Deleted</p> <p><i>Rationale:</i> This statement is already in the Amendment BO that we have to follow—unless the BO on Forest Plan revision supercedes it with a new strategy. Also, this describes process related to consultation. The consultation process will proceed according to requirements of the ESA and its implementing regulations and cannot be changed by Forest Plan direction.</p>
<p>FW S&G – 2670 T&E Species – Indiana Bat a. These projects do not count against the annual allowable acres permitted under the programmatic incidental take statement.</p> <p><i>Concern:</i> This is repeating a statement in the FW BO for the T&E Amendment that we already have to follow. Also, this is not really direction, just additional information.</p>	<p>Deleted</p> <p><i>Rationale:</i> This statement is already in the Amendment BO that we have to follow—unless the BO on Forest Plan revision supercedes it with a new strategy. . The consultation process will proceed according to requirements of the ESA and its implementing regulations and cannot be changed by Forest Plan direction.</p>
<p>FW S&G – 2670 T&E Species – Indiana Bat 10) In addition to those projects allowed under the programmatic incidental take statement, specific projects may also proceed during the <u>non-hibernation</u> period without <u>formal</u> consultation if:</p> <ul style="list-style-type: none"> a) They occur outside of areas of influence for Indiana bats, or areas surrounding known Indiana bat roost trees or capture sites, <u>and</u> b) They are surveyed for Indiana bats according to protocols established by the USFWS, <u>and</u> c) No Indiana bats are detected. <ul style="list-style-type: none"> i. When Indiana bats are not detected, it will be assumed they may be present, but in such low numbers that the project is not likely to adversely affect them. ii. Projects cleared by surveys under this standard must be completed within three years of the surveys. d) These projects do not count against the annual allowable acres permitted under the programmatic incidental take statement. Acres affected under this exception will be reported as required under 2670(A) (13) (c) (2). <p><i>Concern:</i> This is repeating a statement in the FW BO for the T&E Amendment that we already have to follow.</p>	<p>Deleted</p> <p><i>Rationale:</i> This statement is already in the Amendment BO that we have to follow—unless the BO on Forest Plan revision supercedes it with a new strategy. This is process and information related to consultation.. The consultation process will proceed according to requirements of the ESA and its implementing regulations and cannot be changed by Forest Plan direction. To facilitate consistent application of the process by Forest biologists over time, this type of process information can be kept in a document outside of the Plan so that it can be updated or changed as needed without a Plan amendment. However, any changes cannot alter the consultation process and do not alter any BO terms and conditions.</p>
<p>FW S&G – 2670 T&E Species – Indiana Bat 11) To ensure that the exemption of incidental take is appropriately documented, the USFWS will implement a tiered programmatic consultation approach. As individual projects are proposed under the Forest Plan,</p>	<p>Deleted</p> <p><i>Rationale:</i> This statement is already in the Amendment BO that we have to follow—unless the BO on Forest Plan revision supercedes it with a new strategy. This</p>

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<p>the MNF shall provide project-specific information to the USFWS that (1) describes the proposed action and the specific area to be affected, (2) identifies the species that may be affected, (3) describes the manner in which the proposed action may affect listed species and the anticipated effects, (4) specifies that the “anticipated effects from the proposed project are similar to those anticipated in the programmatic biological opinion”, (5) a cumulative total of take that has occurred thus far under the tier I biological opinion, and (6) describes any additional effects, if any, not considered in the tier I consultation.</p> <p><i>Concern:</i> This direction repeats a statement in the FW BO for the T&E Amendment that we already have to follow. Also, the first sentence is written as a USFWS commitment, which shouldn’t appear in our Forest Plan.</p>	<p>describes process and information related to consultation. The consultation process will proceed according to requirements of the ESA and its implementing regulations and cannot be changed by Forest Plan direction. To facilitate consistent application of the process by Forest biologists over time, this type of process information can be kept in a document outside of the Plan so that it can be updated or changed as needed without a Plan amendment. However, any changes cannot alter the consultation process and do not alter any BO terms and conditions.</p>
<p>FW S&G – 2670 T&E Species – Indiana Bat 12) Develop an outreach program specifically directed towards eastern woodland bat species and their conservation needs. The program would target federal, state, and private foresters, land managers, and the general public.</p> <p><i>Concern:</i> This repeats a discretionary conservation recommendation in the FW BO for the T&E Amendment.</p>	<p>Replaced by FW TEP Species Goal TE05 - Collaborate on outreach programs for TEP species and their conservation needs.</p> <p><i>Rationale:</i> This seemed more appropriate as a goal than a standard or guideline, as it is something that we would like to achieve in the future, rather than a constraint on our current management. Plus, we felt that this is a deserving goal for all TEP species, not just Indiana bat, and that our role is more appropriate as a program collaborator than a developer, as we do not technically have the authority to manage species, just habitat.</p>
<p>FW S&G – 2670 T&E Species – Indiana Bat 13) Retain or create small pools of water during road abandonment where appropriate, given other resource concerns. These pools will provide additional sources of drinking water for forest bats.</p> <p><i>Concern:</i> This direction already exists in the management prescription areas that we intend to actively manage. And the wording has been changed to more accurately reflect what we do.</p>	<p>Replaced by MP 3.0 Goal 3015, MP 4.1 Goal 4131, MP 6.1 Goal 6134 - Maintain natural areas of standing water as wildlife watering sources. Create artificial water sources as needed in conjunction with other resource activities.</p> <p><i>Rationale:</i> The pools are provided for wildlife in general, not just bats. We can create pools as we decommission roads, but we do not want to limit this to one activity if there are other opportunities or areas available.</p>
<p>FW S&G – 2670 T&E Species – Indiana Bat 14) Burn plans for prescribed fires will be developed to ensure adverse effects to Indiana bats are avoided.</p> <p><i>Concern:</i> This is really a Forest-wide TEP species and habitat issue. Also, the wording makes it sound like we will have prescribed fires and burn plans specifically to avoid adverse effects to Indiana bats. And because the Fire Management staff will be preparing the burn plans, this should probably go in the Fire Management section.</p>	<p>Replaced by FW Fire Management Standard FM12 - A prescribed burning plan must be prepared and approved prior to using prescribed fire as a management tool. The plan shall address protection or maintenance of TEP species and habitat, cultural resources, watershed resources, air quality, private property, and other resources or investments as needed or appropriate.</p> <p><i>Rationale:</i> Revised FW version covers all TEP species and clarifies that mitigation for TEP species or habitats may be needed or appropriate in any burn plan.</p>
<p>FW 2670 T&E Species – Species Subtitle d. Eastern Cougar</p>	<p>Deleted</p> <p><i>Rationale:</i> Having direction for cougars in the Plan implies that we have cougars on the Forest, and we have</p>

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	no evidence that they currently exist here.
<p>FW S&G – 2670 T&E Species – Eastern Cougar Observations or evidence of presence will be reported to WVDNR in order to verify the existence of this species.</p> <p><i>Concern:</i> We would do this as a matter of course. However, an individual report is not enough to verify the existence of an entire species, although it could help establish that cougar may be in this area.</p>	<p>Deleted</p> <p><i>Rationale:</i> See comments above. If by chance a cougar is seen by a FS employee, we would not have to rely on a Forest Plan standard to know about it and pass that information along to WVDNR. We already have an MOU with them that includes information sharing.</p>
<p>FW 2670 T&E Species – Species Subtitle e. Cheat Mountain Salamander</p>	<p>FW TEP Species – Species Subtitle Cheat Mountain Salamander</p>
<p>FW S&G – 2670 T&E Species – CMS 1) The Cheat Mountain salamander is a woodland species found only in West Virginia. While it appears to prefer red spruce forests, it has been found in hardwood stands some distance from spruce – stands which, historically, may have been spruce stands. It usually occurs above 2,600 feet in elevation, in or under logs, under rocks and mosses, and where critical temperatures, humidity, and moisture regimes meet their close tolerance needs. Since occupied habitat is not continuous and is not easily discernible, an on-the-ground survey for occupancy prior to vegetation and surface disturbance will be conducted. Located colonies, including their buffer, will be avoided.</p> <p><i>Concern:</i> The first three sentences are information, not direction. The fourth sentence implies that surveys will be conducted everywhere, rather than just in possible habitat. The last sentence says that colonies will always be avoided, which may be impossible with activities such as dispersed recreation or T&E habitat enhancement, rather than specifying what sort of activities should be avoided near the colony.</p>	<p>Replaced by FW TEP Species Standard TE55 - Prior to proposed vegetation or surface disturbance in known or potential habitat, field surveys must be conducted and occupied habitat must be delineated.</p> <p>Replaced by FW TEP Species Standard TE56 - Ground and vegetation-disturbing activities shall be avoided within occupied habitat and a 300-foot buffer zone around occupied habitat, unless analysis can show that the activities would not have an adverse effect on populations or habitat.</p> <p><i>Rationale:</i> We felt this met the intent of the Amendment S&G, while removing unnecessary information and making the direction a little easier to understand and more flexible to implement. Although the direction to conduct a survey could be viewed as unnecessary since we already survey for presence in cases where surveys are likely to provide useful and cost-effective information about species presence, we left it in because a survey is necessary to delineate the population and apply a 300-foot buffer.</p>
<p>FW S&G – 2670 T&E Species – CMS 2) A minimum 300-foot buffer zone will be established around known Cheat Mountain salamander populations. The buffer zone will be based on information in the Recovery Plan for the Cheat Mountain Salamander or the best, most current scientific literature.</p> <p><i>Concern:</i> There’s no real management direction here because we haven’t identified any management restrictions within the buffer. Also, what if the “most current scientific literature” tells us we only need a 200 foot buffer. Then we would have conflicting direction.</p>	<p>Replaced by FW TEP Species Standard TE56 - Ground and vegetation-disturbing activities shall be avoided within occupied habitat and a 300-foot buffer zone around occupied habitat, unless analysis can show that the activities would not have an adverse effect on populations or habitat.</p> <p><i>Rationale:</i> We felt this met the intent of the Amendment S&G, while linking it to specific types of activities that should be avoided, and making the direction a little easier to understand and more flexible to implement. It is not necessary to say that we will follow the recovery plan or use current scientific literature. That is SOP and part of our regulatory requirement to use the best available information..</p>
<p>None</p>	<p>Added FW TEP Species Goal TE54 for CMS - Identify opportunities to reduce fragmentation of populations and habitat.</p> <p><i>Rationale:</i> We felt that we should also be looking for opportunities to reduce fragmentation—road</p>

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	decommissioning, trail realignment, etc.—in order to help increase habitat and genetic connectivity.
<p>FW 2670 T&E Species – Species Subtitle f. Eagle and Osprey</p>	<p>FW TEP Species – Species Subtitle Bald Eagle</p> <p><i>Rationale:</i> Osprey is not a TEP species.</p>
<p>FW S&G – 2670 T&E Species – Eagle and Osprey The search for eagle and osprey nests on the Forest will continue. Any nesting sites found will be protected.</p> <p><i>Concern and Opportunity:</i> This direction is vague and insufficient and needs an overhaul. Osprey are not listed and should not be in the TEP section. WVDNR conducts statewide annual surveys for eagle nests; it is most efficient for us to rely on those surveys instead of conducting our own. We have raptor nest direction in the Wildlife section. We need to update bald eagle direction consistent with standard bald eagle protection guidelines for the eastern U.S. (e.g., Va. Dept. of Game and Inland Fisheries, 2000).</p>	<p>Replaced by the following standards: FW TEP Species Standard TE57 - Maintain 1,500-foot protection zones around nest sites that have been active within the last three nesting seasons. Activities within this zone must be compatible with bald eagle management. Compatibility determinations shall be made on a case-by-case basis.</p> <p>FW TEP Species Standard TE58 - Seasonal closure orders may be used to control human disturbance in the vicinity of nests.</p> <p>FW TEP Species Standard TE59 – A nest and the tree or structure where it is located shall not be removed or damaged as long as any usable portion of the nest remains, regardless of the time elapsed since the nest was last used, unless there is a concern for public health or safety.</p> <p>FW Wildlife and Fish Standard WF14 - When activities are proposed near a known active raptor nest, a wildlife biologist shall be consulted for measures to avoid or mitigate disturbance.</p> <p><i>Rationale:</i> This direction is more detailed, more comprehensive, more up-to-date and consistent with recent bald eagle management strategies, and it still has flexibility to allow some management near nest sites.</p>
<p>FW 2670 T&E Species – Species Subtitle g. West Virginia Northern Flying Squirrel</p>	<p>FW TEP Species – Species Subtitle West Virginia Northern Flying Squirrel –</p>
<p>FW S&G – 2670 T&E Species – WVNFS Suitable habitat for the West Virginia northern flying squirrel will be managed under MP 8.0 and Zoological Area standards for Opportunity Area 832, consistent with the Guidelines for Habitat Identification and Management found in the Appalachian Northern Flying Squirrels Recovery Plan (Updated).</p> <p><i>Concern:</i> This is no longer accurate with the elimination of Zoological and Opportunity Areas.</p>	<p>Deleted</p> <p><i>Rationale:</i> This direction to follow other direction is no longer needed because all the WVNFS direction is being changed to Forest-wide in Forest Plan revision.</p>
<p>FW 2670 T&E Species – Species Subtitle h. Shale Barren Rock Cress</p>	<p>FW TEP Species – Species Subtitle Shale Barren Rock Cress</p>
<p>FW S&G – 2670 T&E Species – SBRC 1) The shale barren rock cress was listed as a federally endangered plant species in 1989. The recovery plan, completed and approved in June 1992, required the following guidelines to be applied:</p>	<p>Deleted</p> <p><i>Rationale:</i> This sort of information is not needed in the Forest Plan direction. Interestingly enough, we could not find the direction below in the recovery plan, so this statement may be inaccurate anyway.</p>

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<p><i>Concern:</i> This is information, not direction; and it seems to be inaccurate information at that.</p>	
<p>FW S&G – 2670 T&E Species – SBRC a) Prior to conducting any activity on National Forest System land within Greenbrier County, WV, surveys may have to be conducted to locate and identify shale barrens and shale barren rock cress populations. This guideline will be applied on a case-by-case basis in consultation with the USFWS.</p> <p><i>Concern:</i> This direction is not really necessary because we already know where most or all of the shale barrens are now, and we already have to consult with USFWS. Also, surveys are a normal part of the informal Section 7 consultation process in situations where surveys are likely to yield cost-effective information about species presence. USFWS expects surveys in such situations and is unlikely to concur with a “not likely to adversely affect” determination if potential habitat exists and surveys have not been conducted. Therefore, we don’t need plan direction to tell us to do such surveys.</p>	<p>Deleted</p> <p><i>Rationale:</i> Not needed. We have shale barren locations now, and ESA requires us to consult with USFWS on any proposed activities that may affect this species or its habitat.</p>
<p>FW S&G – 2670 T&E Species – SBRC b) Most Forest authorized activities (other than activities such as research/information gathering) are prohibited within shale barrens (i.e. shale barrens will be avoided). Exceptions to this standard will be decided on a case-by-case basis in consultation with the USFWS.</p> <p><i>Concern:</i> Somewhat vague and repetitive. We do not need to say we will consult with USFWS because we already have to by law, regulation, policy, etc.</p>	<p>Rewrote as FW TEP Species Standard TE65 - Vegetation manipulation and ground-disturbing activities are prohibited within shale barrens unless no feasible alternatives exist. Exceptions may be allowed for research or information gathering activities.</p> <p><i>Rationale:</i> This version is more specific as to what sort of activities we want prohibited. It also drops the unnecessary reference to consultation that we already have to follow.</p>
<p>FW 2670 T&E Species – Species Subtitle i. Running Buffalo Clover</p>	<p>Deleted</p> <p><i>Rationale:</i> See comments below.</p>
<p>FW S&G – 2670 T&E Species – RBC Survey broken-canopied forest or non-forest areas to be affected by land transfer, repeated vehicular use, or earth-disturbing activities. Examples of such areas are old home sites, woods roads, savannas, wildlife openings, grazing allotments, old log landings, and roadsides. Known running buffalo clover sites will be protected.</p> <p><i>Concern:</i> The way this is written, we could be required to survey all roads on the Forest for this species, regardless of whether we are proposing a project there. Also, surveys are a normal part of the informal Section 7 consultation process in situations where surveys are likely to yield cost-effective information about species presence. USFWS expects surveys in such situations and is unlikely to concur with a “not likely to adversely affect” determination if potential habitat exists and surveys have not been conducted. Therefore, we don’t need plan direction to tell us to do such surveys. Also, RBC is a disturbance-dependent species. Populations</p>	<p>Deleted</p> <p><i>Rationale:</i> We do not need direction to tell us to do surveys for a TEP species. We already survey for presence in cases where surveys are likely to provide useful, cost-effective information about species presence in areas to be affected by proposed actions. Because RBC is a widespread, disturbance-adapted species that often occurs on our road system, we cannot make blanket statements about avoiding all impacts. Necessary protection measures must be developed on a case-by-case basis in consultation with USFWS.</p>

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<p>should not be extirpated if at all possible, but we may want to create some disturbance in the area to expand habitat, as opposed to protecting the site. Also, “protect” implies complete avoidance. Given that this species often occurs on roads that are needed for management access, it is impossible to avoid all impacts.</p>	
<p>FW S&G – 2670 T&E Species 14) Sensitive, unique, or special plants or animals will be considered in the design of projects. The forest will maintain a list of these species and will coordinate with the WV Heritage Data Base for inventory data (see Appendix U). Mitigation measures will be used as appropriate to protect sensitive species.</p> <p><i>Concern:</i> “Will be considered” is weak direction. The Forest Service no longer tracks any “unique” or “special” species outside of the RFSS list, and we now have separate direction for sensitive species management and rare plant communities. These plants or animals are not T&E species and should not be combined with them.</p>	<p>Replaced by FW Wildlife and Fish Goal WF01 - Provide habitat diversity that supports viable populations of native and desired non-native wildlife and fish species, including Management Indicator Species (MIS), and keeps RFSS from a trend toward federal listing.</p> <p>a) During watershed or project-level analysis, identify and prioritize opportunities to maintain or restore habitat for RFSS, Birds of Conservation Concern, and other species of interest.</p> <p>Replaced by FW Vegetation Goal VE06 - Maintain or restore rare plant communities or individual populations to contribute to biodiversity of the Forest.</p> <p>Replaced by FW Vegetation Goal VE07 - Emphasize conservation and recovery of RFSS where quantity and quality of habitat is a concern. During watershed or project-level analysis in areas containing RFSS habitat, identify and prioritize opportunities for restoring or maintaining RFSS habitat.</p> <p><i>Rationale:</i> This direction is more specific and accurate about providing for sensitive species and rare plant habitat needs. Mitigation standard appears below.</p>
<p>FW 2670 T&E Species - Subtitle B. Sensitive Species</p> <p><i>Concern:</i> Sensitive species do not have the same legal requirements as TEP species</p>	<p>Moved to FW Vegetation and Wildlife and Fish Sections</p> <p><i>Rationale:</i> We can highlight these species in the Plan, but we do not want to imply that they have the same legal status by lumping them with TEP.</p>
<p>FW General – 2670 T&E Species – Sensitive Species B. Sensitive wildlife species will be afforded the highest possible protection commensurate with the other appropriate uses and benefits.</p> <p><i>Concern:</i> Not sure what this means. Need to tie this “highest possible protection” to our sensitive species policy, which is to provide for viable populations and help prevent the species from being listed under the ESA, and describe what we can do to meet the intent of that policy.</p>	<p>Replaced by FW Wildlife and Fish Goal WF01 - Provide habitat diversity that supports viable populations of native and desired non-native wildlife and fish species, including Management Indicator Species (MIS), and keeps RFSS from a trend toward federal listing.</p> <p>a) During watershed or project-level analysis, identify and prioritize opportunities to maintain or restore habitat for RFSS, Birds of Conservation Concern, and other species of interest.</p> <p>Replaced by FW Vegetation Goal VE07 - Emphasize conservation and recovery of RFSS where quantity and quality of habitat is a concern. During watershed or project-level analysis in areas containing RFSS habitat, identify and prioritize opportunities for restoring or maintaining RFSS habitat.</p> <p><i>Rationale:</i> This direction is more specific about meeting</p>

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	our obligation to not contribute to a trend toward listing and to identify opportunities to maintain/restore habitat.
<p>FW S&G – 2670 T&E Species – Sensitive Species 1. A survey for sensitive species will be done during and as part of normal project reconnaissance and design.</p> <p><i>Concern:</i> This direction does not allow for screening out those species that do not have suitable habitat within the proposed project area or species for which surveys are not a cost-effective way to establish presence.</p>	<p>Deleted</p> <p><i>Rationale:</i> In order to achieve the sensitive species goals listed above, we have to determine whether the species are present, or whether suitable habitat for the species is present, and if it is, habitat conditions. Surveys may or may not be the best way to reach this determination, depending on existing information available, the likelihood of habitat occurrence in the project area, detectability of the species, etc.</p>
<p>FW S&G – 2670 T&E Species – Sensitive Species 2. If sensitive species are found, mitigation measures will be made part of the project design.</p> <p><i>Concern:</i> This direction is reactive rather than proactive. It also equates presence with mitigation regardless of the level of impact and without defining what the mitigation would be designed to do. In reality, we would need to analyze potential effects from the project before requiring or designing mitigation measures, and then any mitigation needed would be designed to mitigate negative effects on populations or habitats such that trends toward listing and loss of viability are avoided.</p>	<p>Replaced by FW Vegetation Standard VE11 - Projects within occupied habitats of RFSS shall be designed and implemented to help prevent the species from becoming listed. Project activities that would have the potential effect of contributing to a trend toward listing for these species shall be mitigated as needed to negate or avoid this effect.</p> <p>Replaced by FW Wildlife and Fish Standard WF11 – For management actions that have been identified by the Forest Service as likely to cause a negative effect on RFSS or Birds of Conservation Concern populations, negative effects shall be avoided or minimized to the maximum extent practical while still accomplishing the purpose of the project or action. Unavoidable negative effects shall be mitigated to the extent practical and consistent with the project purpose.</p> <p><i>Rationale:</i> This direction is more specific about meeting our policy of not contributing to a trend toward listing or mitigating negative effects.</p>
<p>FW S&G – 2670 T&E Species – Sensitive Species 3. Data will be collected on sensitive species to determine if they should (1) be dropped from the sensitive species list, (2) be recommended for consideration as a Regional Forester’s sensitive species, or (3) be recommended for Threatened and Endangered status.</p> <p><i>Concern:</i> This direction is worded like a standard, which implies that it is mandatory. It does not allow for the reality that we may not have the funding, or that monitoring methods may not exist, to monitor populations of all 93 RFSS on the Forest. Also, it is narrowly focused on keeping the RFSS list current without addressing the need for information on potential project effects or opportunities for habitat enhancement. Finally, it does not recognize that we may collaborate with, or use information generated by, other agencies.</p>	<p>Replaced by FW Wildlife and Fish Goal WF06 – In conjunction with ongoing inventory and monitoring efforts, and in coordination with monitoring conducted by WVDNR, Forest Service Research, Universities, and other interested organizations, monitor populations and habitats of RFSS, MIS, Birds of Conservation Concern, and other species of interest sufficient to inform watershed and project-level analyses of potential negative effects, as well as opportunities for maintenance, enhancement, or restoration of habitat.</p> <p><i>Rationale:</i> This direction has been expanded to cover other species of interest, like MIS and Birds of Conservation Concern, and the emphasis has been shifted to providing information to inform us of potential negative effects and habitat enhancement opportunities. Converting this direction to a goal more accurately reflects the aspirational nature of monitoring populations of 93 sensitive species, four MIS, and 23 Birds of Conservation Concern. The revised wording recognizes that such broad-scale monitoring can only be</p>

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	accomplished by collaboration among all of the agencies and institutions that have a stake in the well-being of these species.
<p>FW 2670 T&E Species - Subtitle C. Riparian Management</p> <p><i>Concern:</i> Riparian management and direction is primarily concerned with protecting water quality, thus it belongs in the FW Soil and Water section.</p>	<p>Replaced by FW Direction under Soil and Water</p> <p><i>Rationale:</i> This direction should apply to all riparian-dependent species and riparian resources, not just T&E species. The new direction for Stream Channels, Lakes, and Wetlands in the FW Soil and Waters section is designed to provide for all riparian-related resources. The cumulative effect of this new direction would be to maintain, restore, or enhance all of the important habitat features described in the T&E Amendment riparian management direction below.</p>
<p>C. Riparian management will protect and enhance habitat for wildlife species and consider the needs for species identified as Threatened, Endangered, Special, or Unique.</p>	<p>Replaced by FW Soil and Water Goal SW29 – Maintain, enhance, or restore vegetation conditions that provide:</p> <ul style="list-style-type: none"> a) Ecological functions of riparian and aquatic ecosystems. b) Canopy conditions that regulate riparian and stream temperature regimes for native and desired non-native fauna and flora. c) Natural recruitment potential for large woody debris and other sources of nutrient inputs to aquatic ecosystems. d) Bank and channel stability and structural integrity. e) Habitat and habitat connectivity for aquatic and riparian-dependent species and upland species that use riparian corridors. f) Buffers to filter sediment. <p><i>Rationale:</i> This direction has been broadened to include TEP and RFSS management for riparian species in the overall context of riparian ecosystem management.</p>
<p>1. Endangered bat foraging habitat includes riparian land and vegetation approximately 100 feet wide along both sides of streams at least 30 feet wide as of June 15. Included are aquatic ecosystems, floodplains, riparian ecosystems, and wetlands. The following guidelines will apply:</p> <p><i>Concern:</i> New information indicates that endangered bats forage in a wide variety of habitats throughout the Forest, especially within a few miles of occupied caves.</p>	<p>Replaced by FW direction for Indiana bat primary range (see specific explanations below).</p>
<p>a. Protect all standing dead trees, except for public safety in trailside areas. Dead down trees may be removed.</p>	<p>See primary range direction below.</p>
<p>b. Protect living loose bark trees such as hickories, elms, oaks, and sycamores.</p>	<p>See primary range direction below.</p>
<p>c. Protect hollow trees and den trees whether living or dead.</p>	<p>See primary range direction below.</p>
<p>d. Vegetation manipulation, in the form of patch clearcutting (five acres or less), may be accomplished to perpetuate or establish desirable tree species or composition in riparian areas.</p>	<p>Replaced by FW Soil and Water Standard SW34 – No programmed timber harvest shall occur within the channel buffers identified in the table in SW37. Tree removal from the buffers may only take place if needed</p>

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	<p>to meet aquatic or riparian resource management needs, or to:</p> <ul style="list-style-type: none"> a) Provide habitat improvements for aquatic or riparian species, or threatened, endangered, sensitive, and locally rare species; b) Provide for public or worker safety; c) Construct or renovate an approved facility; d) Construct temporary road, skid road, or utility corridor crossings; e) Conduct aquatic or riparian-related research, or f) Allow for cable yarding. <p>Rationale: This direction has been expanded to include TEP and RFSS management for riparian species in the larger context of all forms of allowable tree removal in stream channel buffers.</p>
<p>Major occupancy developments in riparian areas will not be encouraged but considered on a case-by-case basis through the Environmental Analysis process.</p> <p><i>Concern:</i> What’s a “major occupancy development,” a hotel or subdivision, or just a campground?</p>	<p>Replaced by FW Soil and Water Standard SW42 – New trails, campsites, and other recreational developments shall be located, constructed, and maintained to minimize impacts to channel banks and other riparian resources.</p> <p><i>Note:</i> Any major development in riparian area or elsewhere, would have to, by law, go through the NEPA process, including full environmental analysis and disclosure, and consultation if appropriate.</p>
<p>Extensive use of pesticides in foraging habitat should be avoided.</p> <p><i>Concern:</i> It is unclear what constitutes “extensive” pesticide use.</p>	<p>Replaced by FW Vegetation Guideline VE23 – Where pest problems occur, the selection of corrective measures should take into account management objectives, effectiveness, safety, environmental protection, and cost.</p> <p>Replaced by FW Vegetation Guideline VE32 – During environmental analysis for pesticide use, other reasonable alternatives should be evaluated to achieve the purpose and need of the project.</p> <p>Replaced by FW Vegetation Guideline VE34 – Use application techniques that provide proper pesticide placement on the target area or species. Low pressure spray equipment is preferred.</p> <p>Rationale: This direction avoids the ambiguity of “extensive” while stipulating that pesticide use anywhere on the Forest, including bat foraging habitat, should be limited to those situations where it is the best method of control and can be conducted without serious environmental impacts.</p>
<p>Management Prescription 6.3</p> <p><i>Concern:</i> When this prescription was originally developed, it did not necessarily reflect the easiest or best way to apply management direction for Indiana bats across the Forest. The direction was distributed into Forest-wide, Management Prescription (MP) 6.3, and</p>	<p>FW TEP Species - Indiana Bat Primary Range</p> <p><i>Rationale:</i> The 6.3 prescription was replaced by Forest-wide direction for Indiana bat primary range for the following reasons:</p> <ol style="list-style-type: none"> 1. The 6.3 prescription areas and the primary ranges

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<p>Opportunity Area (OA) 838 primarily to blend in with the existing management direction format in the 1986 Plan. Part of the rationale for doing this was to limit the amount of overall or significant change that was being made to the 1986 Plan, in the hope of keeping the T&E Amendment non-significant. That didn't happen. Now that the Forest Plan is undergoing revision, there is an opportunity to revisit the various layers of direction that were created for the T&E Amendment, and determine ways of making that direction clearer and more concise, less repetitious, and easier to find and understand. There is also a need to clearly identify each piece of direction as either a goal, objective, standard, or guideline; and to have each piece read like the type of direction it is supposed to be, according to the latest regional and national guidelines.</p>	<p>have the same size, shape, description, and intent.</p> <ol style="list-style-type: none"> 2. The primary range direction can be applied the same as the 6.3 prescription; as an overlay on existing management prescriptions. 3. Making this Forest-wide direction sends a clear message that this direction is to be applied wherever NFS lands occur within a 5-mile radius of hibernacula, regardless of the underlying prescription. 4. Making 6.3 direction Forest-wide eliminates the need for an additional management prescription. This, in turn, eliminates substantial repetition of direction and some 6.3 direction that was just filler. 5. Making the 6.3 and OA direction Forest-wide allows all essential Indiana bat direction to be located in one place, making it easier for the reader to find and understand the complete suite of direction that exists. 6. The RO currently discourages the use of single-species management prescriptions, as they do not fit the description of what a management prescription was intended to be.
<p>Primary Purpose – Management of the habitat most likely to be used as summer roosting, foraging, and fall swarming habitat by Indiana bats on the MNF. This habitat is referred to as the primary range of the Indiana bat.</p>	<p>Replaced by Description of IB Primary Range in Glossary - Habitat that is most likely to be used for summer roosting, foraging, and fall swarming by Indiana bats. On the Monongahela National Forest, primary range generally includes all lands within 5 miles of known Indiana bat hibernacula.</p>
<p>Area Description</p>	<p>Delete <i>Rationale</i> – Not needed because this is no longer a Management Prescription area.</p>
<p>Desired Future Condition</p>	<p>Delete <i>Rationale</i> – Not needed because this is no longer a prescription. The FW TEP Species section now has desired conditions. Because much primary range is now included in MP 6.1, this MP now includes desired conditions for primary range.</p>
<p>MP 6.3 S&G - 1500 External Relations 1. Project activities in these areas will require consultation with USDI, Fish and Wildlife Service (USFWS). WVDNR will be kept informed of activities.</p> <p><i>Concern:</i> Consultation requirements are established by the ESA, its implementing regulations, and the Forest-wide BO, not by the Forest Plan. Consultation should be based largely on the potential effects of the activity rather than a particular management prescription area.</p>	<p>Covered in the Introduction to the FW TEP Species section - Section 7 consultation will occur at the project level for all proposed actions that may affect these species or their habitat.</p> <p><i>Rationale:</i> This statement covers our consultation requirement at the FW level without appearing to supplement or change the consultation process as it is defined by ESA regulations and the Forest-wide BO. We do not have to repeat consultation requirements for each individual species, MP, or OA.</p>
<p>MP 6.3 S&G - 1900 Vegetation 1. Management of vegetation that is less than 5" dbh may occur any time of the year.</p> <p><i>Concern:</i> No major concern.</p>	<p>Deleted</p> <p><i>Rationale:</i> Could leave this just for clarification but it really isn't necessary as long as there is no direction that prohibits this type of activity.</p>
<p>MP 6.3 S&G - 1900 Vegetation 2. Management of vegetation that is 5" dbh or greater</p>	<p>Replaced by FW TEP Species Standard TE29 - Management of vegetation 5 inches dbh or greater may</p>

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<p>may be implemented within the primary range of Indiana bats only to improve or enhance Indiana bat or other threatened and endangered species' habitat, to maintain or enhance natural vegetative communities on appropriate sites (see Forest-wide standards and guidelines 1900 – Vegetation) or for public safety. Also, see MP 6.3 standards for 2400 (Timber Management), 2410 (Timber Regulation), 2460 (Other than Commercial Sales), 2470 (Silvicultural Systems), and 2600 (Wildlife), which are related to vegetation management.</p> <p><i>Concern:</i> Management Direction links are different with new formatting. Also, we may need to maintain habitat, not just improve or enhance it (which is the same thing).</p>	<p>only be implemented if activities:</p> <ul style="list-style-type: none"> a) Maintain or improve Indiana bat or other TEP species' habitat, or b) Address public or worker safety concerns, or c) Achieve research objectives. <p><i>Rationale:</i> This version is easier to read and more flexible for maintaining or improving Indiana bat habitat. It also removes the management direction links that are no longer valid. New links are provided where they are appropriate.</p>
<p>MP 6.3 S&G - 1900 Vegetation 3. Retain all known Indiana bat roost trees.</p> <p><i>Concern:</i> Roost tree retention is covered Forest-wide for IB with better wording. This wording is inconsistent with the FW wording because it does not include exceptions for former roost trees that have lost their roost tree characteristics.</p>	<p>Replaced by FW TEP Species Standard TE23 - Retain all known roost trees until such time as they no longer serve as roost trees (e.g. lose their exfoliating bark or cavities, fall down, decay, or are no longer used by bats).</p> <p><i>Rationale:</i> This revised standard consolidates the roost tree direction in one place and acknowledges that roost trees do not last forever. As noted above, we plan to drop the last phrase, “no longer used by bats,” from the final plan because it may not be possible to determine whether bats have stopped using a particular roost.</p>
<p>MP 6.3 S&G - 1900 Vegetation 4. Retain all shagbark hickory trees, unless they create a safety hazard.</p> <p><i>Concern:</i> Shagbark hickory tree retention is now covered Forest-wide for IB with better wording. Also, situations other than safety hazards could make removal of shagbark hickories unavoidable (e.g., linear rights-of-way).</p>	<p>Replaced by FW TEP Species Standard 21 - Retain all shagbark hickory trees in harvest units except where public or worker safety concerns, or research opportunities exist.</p> <p><i>Rationale:</i> Incorporates safety of workers in harvest units. Specifies we will retain shagbark hickory trees within harvest units, not everywhere or from any threat.</p>
<p>MP 6.3 S&G - 1900 Vegetation 5. Snags and cull trees will be managed to keep them available in this prescription throughout the entire rotation.</p> <p><i>Concern:</i> It's not clear what this means or how it relates to other snag direction for bats. Snag retention is already covered Forest-wide for IB with clearer wording. A “rotation” usually refers to a harvest unit of trees. Does this direction mean we need to maintain snags and culls in the same harvest unit over a 70-120 year rotation or longer? That's quite a commitment, especially when you throw natural processes like death, fire, and windthrow into the mix.</p>	<p>Replaced by FW TEP Species Objective TE28 - Provide a continuous supply of suitable roost trees by maintaining a minimum of 50 percent of each primary range on NFS lands in mid successional (40-79 years), mid to late successional (80-120 years), and late-successional (>120 years) age classes.</p> <p><i>Rationale:</i> This objective has us managing to provide suitable roost trees indefinitely across the primary ranges by providing a substantial proportion of the landscape in the mature and old age classes. See also FW TEP Species Goal TE27.</p>
<p>MP 6.3 S&G - 1900 Vegetation a. Retain all snags unless they create a safety hazard. If an average of less than 6 snags/acre with 9” dbh or greater exist, manually create additional snags, prioritized by the following size classes when available: 16 inches dbh or greater, 9 to 16 inches dbh, 5 to 9 inches dbh.</p>	<p>Replaced by FW TEP Species Standard TE30 for primary range - Retain all harvest unit snags greater than 5 inches dbh except where public or worker safety concerns exist.</p> <p><i>Rationale:</i> This rewrite addresses snag retention in</p>

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<p><i>Concern:</i> The second sentence is already covered by Forest-wide snag direction for Indiana bats. The first sentence is unnecessarily restrictive. Why would we need to retain snags under 5” dbh if bats don’t use them?</p>	<p>harvest units and allows small snags to be incidentally knocked down without violating a Forest Plan standard. Snag creation is already covered by FW TEP Species Standard TE22. Snag removal by firewood gatherers is generally prohibited by FW Timber Resources Standard TR16.</p>
<p>MP 6.3 S&G - 1900 Vegetation b. Leave at least 5 cull trees per acre--preferably shagbark hickory, bitternut hickory, red oak, white oak, sugar maple, white ash, green ash, and/or sassafras, prioritized by the following size classes when available: 16 inches dbh or greater, 9 to 16 inches dbh.</p> <p><i>Concern:</i> Could be a little clearer. Maybe separate into 2 sentences, and don’t worry so much about size classes.</p>	<p>Replaced by FW TEP Species Standard TE31 for primary range - Leave at least 5 cull trees per acre, if available—preferably shagbark hickory, bitternut hickory, red oak, white oak, sugar maple, white ash, green ash, and/or sassafras. Prioritize cull retention from the largest to the smallest dbh.</p> <p><i>Rationale:</i> Rewrote for clarity.</p>
<p>None</p>	<p>Added FW TEP Species Goal TE 27 for primary range - Manage naturally occurring tree species composition to provide a continuous supply of suitable roost trees and foraging habitat for Indiana bat. Achieve vegetative diversity that maintains or improves Indiana bat habitat. Where consistent with management prescription emphasis, use a variety of silvicultural methods to create desired age class diversity.</p> <p><i>Rationale:</i> This was created from information in the MP 6.3 Desired Future Condition section.</p>
<p>MP 6.3 S&G – 2150 Pesticide Use 1. Limit use of pesticides in these areas.</p> <p><i>Concern:</i> Need to better define what we mean by “limit”. Also, protections apply to more than just Indiana bat primary range.</p>	<p>Deleted</p> <p><i>Rationale:</i> “Limit use” doesn’t really provide much direction. Use is limited across the entire Forest, and limitations are covered by FW direction in Vegetation section (see discussion above). Any proposal for use in TEP habitat would have to undergo NEPA analysis and informal consultation with USFWS.</p>
<p>MP 6.3 S&G – 2200 Range Management 1. The development of the forage resource will be limited to existing allotments within the Indiana bat primary range. Allotment plans will be designed to protect or enhance Indiana bat habitat and water quality values.</p> <p><i>Concern:</i> This seems overly restrictive given that MP 6.3 contains a Wildlife Management (2600) Standard/Guideline (5) that calls for 5 percent of the MP to be maintained openings. There appears to be no reason range allotments can’t contribute to these openings.</p>	<p>Replaced by FW TEP Species Standard TE32 for primary range – New livestock grazing areas shall not cause maintained openings to exceed 5 percent of each primary range. Allotment Management Plans shall be modified, if needed, to ensure allotment management is compatible with Indiana bat habitat management.</p> <p><i>Rationale:</i> Clarification that we’re trying to limit openings related to allotments because of canopy cover concerns. Riparian and range direction should limit water quality impacts.</p>
<p>MP 6.3 S&G – 2300 Recreation Management 1. The semi-primitive non-motorized ROS class will be emphasized in the primary range of Indiana bat, except within the boundaries of developed recreation sites.</p> <p><i>Concern:</i> If 6.3 no longer exists, we can’t apply an ROS class to it. Also, ROS has little to do with Indiana bat habitat.</p>	<p>Deleted</p> <p><i>Rationale:</i> This is not needed as we convert from 6.3 to FW direction. Indiana bat direction will apply to the primary ranges across the Forest, but those primary ranges will already have a Management Prescription and assigned ROS. That MP ROS will apply regardless of Indiana bat direction.</p>

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<p>MP 6.3 S&G – 2300 Visual Management 1. The Indiana bat primary range will be managed to meet the same visual quality objectives identified for MP 6.1 areas.</p> <p><i>Concern:</i> VQOs will no longer apply after FP revision, and they have little to do with Indiana bat management.</p>	<p>Deleted</p> <p><i>Rationale:</i> This is not needed as we convert from 6.3 to FW direction. Indiana bat direction will apply to the primary ranges across the Forest, but those ranges will already have assigned SMS integrity levels. Those SMS integrity levels will apply regardless of Indiana bat direction. Much of Indiana bat primary range is in 6.1, however, so in effect, MP 6.1 SMS integrity levels will apply to much of the Forest’s primary range..</p>															
<p>MP 6.3 S&G – 2400 Timber Management 1. Timber management practices may be implemented on National Forest lands within the primary range of Indiana bats only to improve or enhance Indiana bat or other threatened and endangered species habitat, to maintain or enhance natural vegetative communities on appropriate sites (see Forest-wide standards and guidelines 1900 – Vegetation), or for public safety.</p> <p><i>Concern:</i> This says essentially the same thing as the FW TEP Species Standard TE29 only it’s a little less restrictive.</p>	<p>Deleted</p> <p><i>Rationale:</i> This direction is similar to FW TEP Species Standard TE29, only it’s a little less restrictive in that it allows timber management to maintain or enhance natural vegetative communities on appropriate sites, but it doesn’t allow research activities. We could go either way here, but we need to be consistent.</p>															
<p>MP 6.3 S&G – 2410 Timber Regulation 1. To meet Indiana bat and other wildlife needs, seek to establish a balanced age class distribution. Normal rotation ages would be:</p> <table border="1"> <thead> <tr> <th><u>Species</u></th> <th><u>Productivity</u></th> <th><u>Rotation Ages</u></th> </tr> </thead> <tbody> <tr> <td>Oak Hickory</td> <td>All sites</td> <td>200</td> </tr> <tr> <td>Mixed Hardwood</td> <td>All sites</td> <td>200</td> </tr> <tr> <td>Conifer (Spruce & Pine)</td> <td>All sites</td> <td>80-100</td> </tr> <tr> <td>Black Cherry</td> <td>All sites</td> <td>120</td> </tr> </tbody> </table> <p><i>Concern:</i> 200-year rotation ages are not useful for defining current management when most sites are still 100 years away from the rotation age. Age class diversity goals may conflict with the requirement that the primary purpose of vegetation management in primary range is Indiana bat habitat enhancement.</p>	<u>Species</u>	<u>Productivity</u>	<u>Rotation Ages</u>	Oak Hickory	All sites	200	Mixed Hardwood	All sites	200	Conifer (Spruce & Pine)	All sites	80-100	Black Cherry	All sites	120	<p>Deleted</p> <p><i>Rationale:</i> Age class desired conditions are already expressed in the Management Prescription areas that allow timber harvest, and they should provide for an overall diversity of habitat for the Indiana bat and other species. The FW direction for primary range will override these desired conditions in cases where the desired conditions are not consistent with maintenance or enhancement of Indiana bat habitat. Within primary range, age class diversity that is beneficial for the Indiana bat would be better achieved through FW TEP Species Goal TE28 (see discussion above).</p>
<u>Species</u>	<u>Productivity</u>	<u>Rotation Ages</u>														
Oak Hickory	All sites	200														
Mixed Hardwood	All sites	200														
Conifer (Spruce & Pine)	All sites	80-100														
Black Cherry	All sites	120														
<p>MP 6.3 S&G – 2410 Timber Regulation 2. To minimize disturbance and provide “escape areas” for wildlife, no more than 40 percent of the opportunity area acreage will be directly disturbed at any given time.</p> <p><i>Concern:</i> This was carried over from MP 6.1 and doesn’t really apply as Forest-wide direction for bats. “Opportunity areas” no longer exist.</p>	<p>Deleted</p> <p><i>Rationale:</i> This direction was originally intended for species like bear and turkey, which are sensitive to human disturbance. A version of this direction was carried over into the revised MP 6.1.</p>															
<p>MP 6.3 S&G – 2460 Other Than Commercial Sales 1. Dead and down firewood may be cut any time during the year along forest roads open to the public. Cutters must have a valid permit.</p> <p><i>Concern:</i> This is prescription filler. We’re better off just using the FW direction under Timber instead. Plus, this</p>	<p>Covered by FW Timber Resources Standard TR16 - Trees must be both dead <u>and</u> down for personal use firewood, except where determined by the Forest to be a risk to public safety or in designated areas covered by the guideline below. Cutters must have personal use firewood permits.</p>															

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<p>S&G makes it sound as if firewood cutting would be available at any time, which may not be always be the case (e.g., a closure order could make certain areas off limits).</p>	<p>FW Timber Resources Guideline TR17 - The Forest may make green firewood available to the public in designated areas. These areas should contribute to the accomplishment of resource management objectives.</p> <p><i>Rationale:</i> This subject is covered more comprehensively under FW direction in Timber Resources.</p>
<p>MP 6.3 S&G – 2470 Silvicultural Systems 1. The even-aged silvicultural system generally will be used to create age class diversity and balance age classes over the long term. However, the uneven-aged silvicultural system may be used if deemed appropriate after a site-specific analysis.</p> <p><i>Concern:</i> This is more of a guideline that is trying to describe preferred methods while allowing for other methods when conditions vary. There is considerable potential for confusion by saying that even-aged management is preferred in areas where enhancement of Indiana bat habitat is the primary purpose of vegetation management. Current science suggests that traditional even-aged management (i.e., clearcutting) does not enhance Indiana bat habitat. One generic guideline should cover this and the direction below.</p>	<p>Replaced by FW TEP Species Guideline TE38 for primary range - Shelterwood and two-aged regeneration harvests are the preferred silvicultural methods. Alternate methods may be used to meet other vegetation or wildlife habitat objectives when compatible with Indiana bat management. Thinning from below is the preferred management method for stands originating before 1905.</p> <p><i>Rationale:</i> See concern statement opposite.</p>
<p>MP 6.3 S&G – 2470 Silvicultural Systems 2. Of the even-aged silvicultural methods that could be implemented, shelterwood and two-aged regeneration harvests generally will be used to provide preferred foraging and roosting habitat. However, clearcutting with residuals may be used if needed for the regeneration of a particular tree species or to meet other wildlife objectives when consistent with Indiana bat management.</p> <p><i>Concern:</i> This is more of a guideline that is trying to describe preferred methods but allowing for other methods when conditions allow or vary. One generic guideline should cover this and the direction above.</p>	<p>Replaced by FW TEP Species Guideline TE38 for primary range - Shelterwood and two-aged regeneration harvests are the preferred silvicultural methods. Alternate methods may be used to meet other vegetation or wildlife habitat objectives when compatible with Indiana bat management. Thinning from below is the preferred management method for stands originating before 1905.</p> <p><i>Rationale:</i> See concern statement opposite.</p>
<p>MP 6.3 S&G – 2470 Silvicultural Systems 3. Without preventing the regeneration of desired tree species, retain as much basal area as possible in even-aged cut units so as to meet the habitat needs of Indiana bats.</p> <p><i>Concern:</i> “As much basal area as possible” is a pretty vague term. The determination should be a joint recommendation by the project biologist and silviculturist based on site-specific conditions, which will vary widely.</p>	<p>Replaced by FW TEP Species Guideline TE39 – Without preventing the regeneration of desired tree species, sufficient basal area should be retained in even-aged harvest units to meet the habitat needs of Indiana bats. Basal area determinations should be coordinated between the project silviculturist and wildlife biologist, based on site-specific vegetative conditions and habitat needs.</p> <p><i>Rationale:</i> See concern statement opposite. We made this direction a guideline to provide more flexibility to address site-specific variations in conditions. We don’t foresee much pure even-aged management occurring in primary range in the foreseeable future because of our current understanding that such harvests do not enhance Indiana bat habitat. However, we kept this guideline in its revised form in case modified even-aged techniques</p>

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	are necessary to maintain a tree species composition that is favorable to long-term provision of potential roost trees.
<p>MP 6.3 S&G – 2470 Silvicultural Systems</p> <p>4. When designing regeneration harvest areas under the even-aged system, the following will be used to ensure appropriate “leave trees” are retained for Indiana bat habitat:</p> <p>a. Follow 1900 standards for snag and cull management.</p> <p>b. For shelterwood and two-aged regeneration harvests, retain a component of the largest live shagbark hickory, bitternut hickory, red oak, white oak, sugar maple, white ash, green ash, and/or sassafras, prioritized by the following size classes when available: 16 inches dbh or greater, 9 to 16 inches dbh.</p> <p>c. Retain clumps of live trees (preferably shagbark hickory, bitternut hickory, red oak, white oak, sugar maple, white ash, green ash, and/or sassafras) and shrubs around known Indiana bat roost trees, shagbark hickories, culls or larger-diameter snags.</p> <ol style="list-style-type: none"> 1) These clumps should be attached to the woodland edge by a corridor of trees, if possible. 2) Snag or cull clumps left along stream shade strips or seeps are preferred over isolated clumps or clumps along other edges. <p>d. Retain living residual trees (identified via 1900 and 2470 #4) in the vicinity of 1/3 of the snags to provide them with partial shade in summer.</p> <p><i>Concern:</i> This is good direction to meet the theoretical needs of bat habitat, but it needs to be simplified a bit to have a better chance of being effectively implemented on the ground. Recommend not using the word “ensure”, as there are too many variables in nature and management that can come into play.</p>	<p>Replaced by FW TEP Species Standard TE33 – When designing and implementing regeneration harvest units, the following direction shall be used to help retain appropriate leave trees for Indiana bat habitat:</p> <ol style="list-style-type: none"> a) Preferred residual trees for shelterwood and two-aged regeneration harvest should include the following species as available: shagbark hickory, bitternut hickory, red oak, white oak, sugar maple, white ash, green ash, and/or sassafras. Prioritize residual trees from the largest to the smallest dbh. b) Retain clumps of live trees and shrubs at a rate of 1/3 an acre per 5 to 8 acres of regeneration harvest area. Clumps should be co-located with other retained features. <p><i>Rationale:</i> This version should be a little easier to understand and more flexible to implement, while still achieving the same objectives as the original.</p>
<p>MP 6.3 S&G – 2470 Silvicultural Systems</p> <p>5. If individual and group selection harvests are implemented, ensure that a component of large, over-mature trees, if available, remain in the immediate vicinity to provide suitable roosting habitat.</p> <p><i>Concern:</i> Why make this conditional? Just assume that we will have uneven-aged harvests and describe what they should do. Recommend not using the word “ensure”.</p>	<p>Replaced by FW TEP Species Standard TE34 – Uneven-aged harvests shall maintain a component of large, over-mature trees, if available, in the immediate vicinity of roost trees to provide suitable roosting habitat.</p> <p><i>Rationale:</i> Slight wording change, same direction.</p>
<p>MP 6.3 S&G – 2470 Silvicultural Systems</p> <p>6. Until a balanced age class distribution is achieved, regeneration harvests may occur anytime after age 70 and will be emphasized in stands originating after 1905.</p> <p><i>Concern:</i> We’re not trying to achieve a “balanced” age class distribution so much as a “desired” age class distribution that will be defined for different Management Prescriptions. Management direction for primary range focuses on maintaining or enhancing certain features of</p>	<p>Replaced by FW TEP Species Guideline TE38 - Shelterwood and two-aged regeneration harvests are the preferred silvicultural methods. Alternate methods may be used to meet other vegetation or wildlife habitat objectives when compatible with Indiana bat management. Thinning from below is the preferred management method for stands originating before 1905.</p> <p><i>Rationale:</i> Needed to remove the statement that implied we were trying to achieve “balanced” age classes. Also,</p>

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<p>bat habitat and might modify the MP's desired age class distribution This direction and the one below were somewhat confusing and possibly conflicting as written.</p>	<p>rotation age is immaterial here. We are managing for bat habitat not wood production, and we really only have one age class to work with until we create younger stands.</p>
<p>MP 6.3 S&G – 2470 Silvicultural Systems 7. Harvests to improve Indiana bat habitat may be conducted at any stand age. However, thinning from below would be the preferred method for stands originating before 1905.</p> <p><i>Concern:</i> This first sentence was somewhat confusing, in that we just said in the direction above that we would wait until age 70 to do regeneration harvests.</p>	<p>Replaced by FW TEP Species Guideline TE38 - Shelterwood and two-aged regeneration harvests are the preferred silvicultural methods. Alternate methods may be used to meet other vegetation or wildlife habitat objectives when compatible with Indiana bat management. Thinning from below is the preferred management method for stands originating before 1905.</p> <p><i>Rationale:</i> Dropped the first sentence in this version.</p>
<p>MP 6.3 S&G – 2470 Wildlife Management Provide a continuous supply of suitable roost trees by maintaining a minimum of 20 percent of the primary range in old growth and a minimum of 50 percent in oak and northern hardwood types over 50 years of age.</p> <p><i>Concern:</i> We don't have 20 percent of any primary range in old growth at present. This is more of an objective for the future than a standard or guideline for current management.</p>	<p>Replaced by FW TEP Species Objective TE28 - Provide a continuous supply of suitable roost trees by maintaining a minimum of 50 percent of each primary range on NFS lands in mid successional (40-79 years), mid to late successional (80-120 years), and late-successional (>120 years) age classes.</p> <p><i>Rationale:</i> This objective emphasizes the mature and old age classes to provide suitable roost trees indefinitely across the primary ranges without mandating a percentage of old growth that we cannot achieve for several decades..</p>
<p>MP 6.3 S&G – 2470 Wildlife Management Provide ample preferred foraging habitat by maintaining a minimum of 50 percent of the primary range in pole and saw timber size classes that have crown closures of 50 percent or greater.</p> <p><i>Concern:</i> This shift from age classes to size classes here is confusing and seems redundant with the S&G directly above it. Which do we want to use? The pole and saw timber classes are roughly equivalent to our mid, mid-to-late, and late successional age classes.</p>	<p>Replaced by FW TEP Species Objective TE28 - Provide a continuous supply of suitable roost trees by maintaining a minimum of 50 percent of each primary range on NFS lands in mid successional (40-79 years), mid to late successional (80-120 years), and late-successional (>120 years) age classes.</p> <p><i>Rationale:</i> This objective has us managing to provide suitable roost trees, but will also provide for preferred foraging habitat since the preferred age classes are similar.</p>
<p>MP 6.3 S&G – 2470 Wildlife Management Maintain no more than 7.5 percent of the primary range in the 0-14 age class (woodland habitat) at any time.</p> <p><i>Concern:</i> This is the first and only time we've used this particular age class. It is not clear what we mean by "the primary range". Is that each primary range or all primary ranges considered together? Need to clarify.</p>	<p>Replaced by FW TEP Species Standard TE35 – Regeneration harvest shall not cause the early successional (0-19 years) age class of forest stands to exceed 10 percent of each primary range at any time.</p> <p><i>Rationale:</i> This direction is more consistent with the age class categories we are using for Forest Plan revision. We expanded the percentage from 7.5 to 10 because the age class is somewhat larger as well.</p>
<p>MP 6.3 S&G – 2470 Wildlife Management Provide adequate water sources by creating or maintaining between 1 and 4 water sources per square mile within the primary range.</p> <p><i>Concern:</i> This direction already exists and is better written in the Management Prescription areas. See MP examples opposite. As written, this direction could compel us to go out a create water sources everywhere in primary range, whether or not we are conducting other</p>	<p>Replaced by MP 3.0 Goal 3015, MP 4.1 Goal 4131, MP 6.1 Goal 6134 - Maintain natural areas of standing water as wildlife watering sources. Create artificial water sources as needed in conjunction with other resource activities.</p> <p><i>Rationale:</i> The pools are provided for wildlife in general, not just bats. As far as "water sources" go, there are typically more than 1-4 natural streams, seeps, bogs, etc. per square mile right now, without us having to provide</p>

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resource management in the area. For cost efficiency, artificial water sources generally are constructed in conjunction with timber management.	more.
<p>MP 6.3 S&G – 2470 Wildlife Management To maintain viable populations of management indicator species, sensitive species, and other threatened, endangered, or proposed species while providing ample Indiana bat foraging habitat, maintain at least 5 percent of the primary range in open or semi-open habitats.</p> <p><i>Concern:</i> Desired conditions for maintained openings are contained in the MPs and can be applied within primary range to the extent they are consistent with Indiana bat management. Because primary range is no longer a separate MP, it does not need its own direction for a habitat component that is provided primarily for species other than the Indiana bat.</p>	<p>Deleted</p> <p><i>Rationale:</i> See concerns opposite.</p>
<p>MP 6.3 S&G – 2700 Special Uses Special use permits may be issued within the primary range if they are compatible with Indiana bat management.</p> <p><i>Opportunity:</i> This direction could be combined with similar direction for gas development.</p>	<p>Replaced by FW TEP Species Standard TE36 – Special use permits and federal mineral exploration and development may be allowed within the primary range.</p> <p><i>Rationale:</i> Combined with similar minerals direction. However, dropping the phrase “if they are compatible with Indiana bat management” appears to have been an error in the draft revised plan. We intend to reinsert this phrase or something similar in the final plan.</p>
<p>MP 6.3 S&G – 2800 Minerals and Geology Gas development within the primary range may be allowed when compatible with management objectives for Indiana bat.</p> <p><i>Concern and Opportunity:</i> Could combine with similar direction for Special Uses.</p>	<p>Replaced by FW TEP Species Standard TE36 – Special use permits and federal mineral exploration and development may be allowed within the primary range.</p> <p><i>Rationale:</i> See comments on this standard above.</p>
<p>MP 6.3 S&G – 2800 Minerals and Geology When mineral rights are privately owned consultation with the USFWS will be undertaken to minimize adverse effects on Indiana bats.</p> <p><i>Concern:</i> Use of the word “consultation” is incorrect because development of private minerals is not a federal action. Section 7 consultation applies to federal actions only. Thus our involvement would consist of working informally with the permitting agencies to minimize impacts to the extent possible. Also, we should apply this to all TEP species, not just Indiana bats.</p>	<p>Replaced by FW TEP Species Standard TE06 - When proposed exploration or development of privately owned mineral rights may adversely affect TEP species or habitat, the Forest shall work with state and federal mineral operation permitting agencies to mitigate adverse effects.</p> <p><i>Rationale:</i> Made this Forest-wide for all TEP Species. Clarified that proposed exploration or development of the rights triggers consultation. Expanded adverse effects to include habitat.</p>
<p>MP 6.3 S&G – 5100 Fire Management Give high priority to controlling forest fires to prevent bat asphyxiation or significant changes to the vegetative cover.</p> <p><i>Concern:</i> Not sure this is needed on the MNF, as fire suppression is pretty much a high priority everywhere.</p>	<p>Deleted</p> <p><i>Rationale:</i> See concern comments opposite. Also, we average less than 10 wildfires a year, and we’d like to introduce more prescribed fire into bat habitat to improve foraging habitat, so we don’t want to give the impression that fire is a huge threat.</p>
<p>MP 6.3 S&G – 5100 Fire Management Burn plans for prescribed fires within the primary range</p>	<p>Replaced by FW Fire Management Standard FM12 - A prescribed burning plan must be prepared and</p>

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<p>will include a smoke management plan that minimizes the duration of smoke in the area, and maximizes smoke dispersion from the area.</p> <p><i>Concern:</i> This is already covered in FW direction. Also, all burn plans are supposed to be designed to minimize smoke duration and maximize dispersion.</p>	<p>approved prior to using prescribed fire as a management tool. The plan shall address protection or maintenance of TEP species and habitat, cultural resources, watershed resources, air quality, private property, and other resources or investments as needed or appropriate.</p> <p><i>Rationale:</i> Revised FW version covers all TEP species and clarifies that mitigation for TEP species or habitats may be needed or appropriate in any burn plan.</p>
<p>MP 6.3 S&G – 6760 Safety Dynamiting may be permitted within the primary range if compatible with Indiana bat management.</p> <p><i>Concern:</i> There is very little use of dynamite on the Forest anymore. Exploration explosives have become fairly high tech and low impact in the past 20 years. This needs to be expanded to cover all types of explosives. Plus, any explosives use that occurs should demonstrate that there is little likelihood of affecting bats or their habitat.</p>	<p>Replaced by FW TEP Species Standard TE37 - Explosives may be allowed within the primary range if it can be demonstrated that this activity will not have an adverse effect on bat populations or habitat.</p> <p><i>Rationale:</i> See concern statement opposite. Also, this direction is consistent with that for VBEB and IB key areas in what used to be the Opportunity Areas. There is an opportunity to now combine all this direction FW.</p>
<p>7700 Transportation System Roads and trails leading to hibernacula may be blocked or obliterated to further discourage access.</p> <p><i>Concern:</i> Need to replace phrases like “may be blocked” and “further discourage”. This is weak direction. We already have the authority and ability to make these sorts of decisions at the site level without plan direction, but if we really want to reduce road or trail-related impacts, we need direction restricting new road or trail construction.</p>	<p>Replaced by FW TEP Species Standard TE48 – New road or trail construction shall be prohibited within hibernacula..</p> <p><i>Rationale:</i> See concern comments, opposite. The T&E Amendment direction was not needed as much as direction regarding new road or trail construction.</p>
<p>Essential Habitat for Virginia Big-Eared Bat (Opportunity Area 837)</p>	<p>Deleted <i>Rationale:</i> Opportunity Area 837 will no longer exist.</p>
<p>OA 837 General Important habitat for VBEB (<i>Corynorhinus townsendii virginianus</i>) will be managed in order to protect and enhance the populations of this species.</p> <p><i>Concern:</i> This direction should be covered FW for all TEP species, rather than having to say it for each species.</p>	<p>Replaced with FW TEP Species Goal TE01 - Provide habitat capable of contributing to the survival and recovery of species listed under the ESA. Provide habitat that may help preclude Proposed species from becoming listed.</p> <p>See also all standards for VBEB habitat below.</p> <p><i>Rationale:</i> Goal TE01 says much the same thing as the Amendment but in a more positive and proactive statement about what we want to do and why. Specific protections are provided by standards that apply to its habitat.</p>
<p>OA 837 S&G – 1500 External Relations Project activities in these areas will require consultation with the U. S. Department of the Interior Fish and Wildlife Service (USFWS). The West Virginia Division of Natural Resources (WVDNR) will be kept informed of activities.</p> <p><i>Concern:</i> Consultation requirements are established by the ESA and its implementing regulations, not by the</p>	<p>Covered in the Introduction to the FW TEP Species section - Section 7 consultation will occur at the project level for all proposed actions that may affect these species or their habitat.</p> <p><i>Rationale:</i> This statement covers our consultation requirement at the FW level without appearing to supplement or change the consultation process as it is defined by ESA regulations. We do not have to repeat it</p>

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Forest Plan. Consultation should be based largely on the potential effects of an activity rather than the area in which it occurs.	for each individual species, MP, or OA.
<p>OA 837 S&G – 1600 Information Cave entrances will be signed and posted against entry. Signs may include USFWS and WVDNR authorities. Although signed at cave entrances, caves will not be located on maps published for distribution to the public. No directional signs on roads or trails will be posted directing people to these caves.</p> <p><i>Concern:</i> No serious problems here, but it contains a bit more process detail than we need in a strategic planning document.</p>	<p>Replaced by FW TEP Standards TE14 and TE15 – Prohibit public entry into caves used as hibernacula from September 1 to May 15.</p> <p>Prohibit public entry into caves used as maternity colonies during the nursery season from April 1 to September 15.</p> <p><i>Rationale:</i> Removed process details and reworded for clarity. However, we recently realized that the wording of the draft TE14 is too inflexible to accommodate our current management strategy of leaving minor hibernacula open. Therefore, for the final plan we intend to reword TE14 as follows: Prohibit public entry into caves and mines used as major hibernacula from September 1 to May 15. Site-specific conditions may dictate more restrictive dates. Minor hibernacula that harbor very few individuals in most years may remain open to the public if the Forest, USFWS, and WVDNR agree that public entry would be extremely unlikely to cause harm or mortality of Virginia big-eared bats.</p>
<p>OA 837 S&G – 1900 Vegetation Vegetation management will be conducted within opportunity areas only (1) to ensure a diversity of habitat types are available to improve or enhance Virginia big-eared bat habitat (Forest Plan, pp. 54-56), (2) for public safety, or (3) in association with abandoned mine site reclamation.</p> <p><i>Concern:</i> Need to rewrite as FW direction for VBEB hibernacula and colonies, rather than OA 837, which does not exist anymore. Also mine site reclamation is typically a non-discretionary activity or legal requirement that doesn't need to be covered here, but research should be.</p>	<p>Replaced by FW TEP Species Standard TE12 – Within 200 feet of hibernacula, maternity colonies, or bachelor colonies, vegetation management shall only be conducted for:</p> <ul style="list-style-type: none"> a) Bat habitat maintenance or improvement b) Public safety, or c) Research. <p><i>Rationale:</i> Reworded to specify where this direction applies, and to include research as a potential reason for vegetation management.</p>
<p>OA 837 S&G – 1950 NEPA 1. Standards and Guidelines listed here are minimal. Others may be added as appropriate when designating each new opportunity area for these bats.</p> <p><i>Concern:</i> We shouldn't need new S&Gs each time we find a new hibernacula or colony. We may need site-specific mitigation, but that's already covered FW.</p>	<p>Deleted</p> <p><i>Rationale:</i> We may develop management plans with site-specific mitigation or project-related mitigation, but let's not infer that we will be creating new standards and guidelines for the Plan every time we find a new maternity site or hibernacula. That could require a plan amendment every time we do.</p>
<p>OA 837 S&G – 1950 NEPA 2. Opportunity areas will be defined as:</p> <ul style="list-style-type: none"> a. An area at least 200 feet in radius from the entrance of inhabited caves. b. An area at least 200 feet in radius around a maternity colony of Virginia big-eared bat as long as the site is used. c. An area at least 200 feet in radius from inhabited abandoned mine adits. 	<p>Deleted</p> <p><i>Rationale:</i> The revised standards addressing VBEB hibernacula, maternity colonies, and bachelor colonies specifically refer to a 200-foot radius around these features. Therefore, this definition is no longer needed.</p>

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<p><i>Concern:</i> This is not direction, just a definition. Opportunity areas do not exist in the revised plan.</p>	
<p>OA 837 S&G – 2150 Pesticide Use 1. Limit use of pesticides in these areas.</p> <p><i>Concern:</i> Need to better define what we mean by “limit”. Also, this protection should apply to all TEP species in all areas.</p>	<p>Replaced by FW Vegetation Guideline VE23 – Where pest problems occur, the selection of corrective measures should take into account management objectives, effectiveness, safety, environmental protection, and cost.</p> <p>Replaced by FW Vegetation Guideline VE32 – During environmental analysis for pesticide use, other reasonable alternatives should be evaluated to achieve the purpose and need of the project.</p> <p>Replaced by FW Vegetation Guideline VE34 – Use application techniques that provide proper pesticide placement on the target area or species. Low pressure spray equipment is preferred.</p> <p><i>Rationale:</i> “Limit use” doesn’t really provide much direction. Use is limited across the entire Forest, and limitations are covered by FW direction in Vegetation section. Any proposal for use in TEP habitat would have to undergo analysis and consultation with USFWS.</p>
<p>OA 837 S&G – 2300 Recreation No new facilities will be constructed for public recreation use.</p> <p>No real concern with this, but because the OA definition was removed, we needed to change the wording to specify where this direction is to be applied.</p>	<p>Replaced by FW TEP Species Standard TE13 for VBEB – New recreation facility construction shall be prohibited within 200 feet of hibernacula, maternity colonies, or bachelor colonies.</p> <p><i>Rationale:</i> Specifies where this standard will apply.</p>
<p>OA 837 S&G – 2400 Timber Vegetative treatments may be undertaken if coordinated with bat habitat requirements in the opportunity area.</p> <p><i>Concern:</i> This may or may not be consistent with Vegetation direction, above, that limits treatments to specific reasons.</p>	<p>Deleted</p> <p><i>Rationale:</i> This is covered under the Vegetation standard for VBEB, above, which provides more detail. Leaving this here would probably just lead to confusion.</p>
<p>OA 837 S&G – 2670 TEP Species Management 1. Public entrance into caves used as hibernacula for Virginia big-eared bat will be prohibited from September 1 to May 15.</p> <p><i>Concern:</i> No major concern. Just need to move from OA section to FW section for VBEB.</p>	<p>Moved to FW TEP Species Standard TE14 for VBEB - Prohibit public entry into caves used as hibernacula from September 1 to May 15.</p> <p><i>Rationale:</i> There is no OA 837 anymore. We did not feel we had to specify the hibernacula were for VBEB because the direction is now in the VBEB section. However, we recently realized that the wording of TE14 is too inflexible to accommodate our current management strategy of leaving minor hibernacula open. Therefore, for the final plan we intend to reword TE14 as follows: Prohibit public entry into caves and mines used as major hibernacula from September 1 to May 15. Site-specific conditions may dictate more restrictive dates. Minor hibernacula that harbor very few individuals in most years may remain open to the public if the Forest, USFWS, and WVDNR agree that public entry would be</p>

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	extremely unlikely to cause harm or mortality of Virginia big-eared bats.
<p>OA 837 S&G – 2670 TEP Species Management 2. Public entrance into caves occupied on the National Forest will be prohibited during the nursery season from April 1 to September 15.</p> <p><i>Concern:</i> Move to FW VBEB section. Clarify that these are maternity colonies if we are concerned about the nursery season.</p>	<p>Moved to FW TEP Species Standard TE15 for VBEB - Prohibit public entry into caves used as maternity colonies during the nursery season from April 1 to September 15.</p> <p><i>Rationale:</i> OA 837 has been converted to FW direction. Clarifies that this applies to maternity colonies.</p>
<p>OA 837 S&G – 2670 TEP Species Management 3. Entry into caves during the closed periods for scientific study and observation will be permitted by written approval of the Forest Supervisor and permit from the USDI, USFWS, or equivalent.</p> <p>No major concerns; could tighten the wording a little. All caves that are closed for whatever reason can be covered with one FW standard.</p>	<p>Replaced by FW TEP Species Standard TE07 – Cave entry during closed periods for scientific study and observation may be permitted by Forest Supervisor’s written approval and permit from USFWS or delegated authority.</p> <p><i>Rationale:</i> Minor wording changes for clarity and ease of reading. Converted to a FW standard that applies to all caves that are closed for whatever reason.</p>
<p>OA 837 S&G – 2670 TEP Species Management 4. Gates or fences installed at cave entrances will allow free entry and exit by the bats and will not restrict normal airflows.</p> <p><i>Concern:</i> Move to FW. Change “will” to “shall” for consistency.</p>	<p>Moved to FW TEP Species Standard TE08 - Gates or fences installed at cave entrances shall allow free entry and exit by TEP species and shall not restrict normal airflows.</p> <p><i>Rationale:</i> OA 837 no longer exists. Changed “will” to “shall” for consistency.</p>
<p>OA 837 S&G – 2670 TEP Species Management 5. Gate installation that disturbs a cave feature or floor must have an archaeological survey prior to disturbance.</p> <p><i>Concern:</i> Move to FW.</p>	<p>Moved to FW TEP Species Standard TE09 - Gate installation that disturbs a cave feature or floor must have an archaeological survey prior to disturbance.</p> <p><i>Rationale:</i> OA 837 no longer exists.</p>
<p>OA 837 S&G – 2670 TEP Species Management 6. Gate installation must conform to requirements of applicable State laws and regulations.</p> <p><i>Concern:</i> Do not need direction to follow state law.</p>	<p>Deleted</p> <p><i>Rationale:</i> Unneeded. We have to follow any applicable state laws and regulations.</p>
<p>OA 837 S&G – 2670 TEP Species Management 7. Gates and fences will be monitored and maintained. Frequency of monitoring should be scheduled based on past cave visits, vandalism history, access, and other conditions of potential gate disturbances. A schedule of at least once a month is recommended. Maintenance and repair of gates should be undertaken within reasonable time from vandalism discovery during the period of closure (generally within two weeks).</p> <p><i>Concern:</i> The “at least once a month” schedule is not very likely given our current level of staffing and budget.</p>	<p>Replaced by FW TEP Species Standard TE10 - Gates and fences shall be monitored and maintained. Base monitoring frequency on past cave visits, access, and potential for disturbance.</p> <p><i>Rationale:</i> The appropriate frequency of monitoring and maintenance can be determined through criteria listed above without tying monitoring frequency to an arbitrary interval that we may not be able to meet.. Moved to FW because OA 837 no longer exists.</p>
<p>OA 837 S&G – 2670 TEP Species Management Prohibit any construction or permanent type of activities within the opportunity area unless created for the protection of Virginia big-eared bats, protection of other cave resources, public safety, or reclamation associated with abandoned mine sites.</p>	<p>Deleted</p> <p><i>Rationale:</i> We have already described the construction and activities that we want to see restricted in FW Standards TE12 through TE20, each of which is discussed elsewhere in this document.</p>

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<p><i>Concern:</i> Need to better describe what we mean by “permanent type of activities” or just use the activities that we have already identified. Move to FW or delete.</p>	
<p>OA 837 S&G – 2700 Special Uses 1. Prohibit special uses in the opportunity area that would be adverse to bat use.</p> <p><i>Concern:</i> Move to FW. Delete OA and replace with habitat features of concern. Not sure what “adverse to bat use” means. Why not use “populations and habitat” similar to other direction?</p>	<p>Replaced by FW TEP Species Standard TE16 - Do not issue permits for special uses occurring within 200 feet of hibernacula, maternity colonies, or bachelor colonies that would have adverse effects on bat populations or habitat.</p> <p><i>Rationale:</i> OA 837 no longer exists. Used habitat features of concern instead. Replaced “adverse to bat use” with adverse effects on populations or habitat for consistency and clarity.</p>
<p>OA 837 S&G – 2700 Special Uses 2. Special use permits will not be issued for caves that harbor Virginia big-eared bats.</p> <p><i>Concern:</i> This is not needed because of the rewritten S&G above.</p>	<p>Deleted</p> <p><i>Rationale:</i> This is now adequately covered by Standard TE16. Special uses occurring within 200 feet of hibernacula and colonies includes any caves that would harbor VBEB.</p>
<p>OA 837 S&G – 2800 Minerals and Geology 1. Surface occupancy will not be permitted for mineral operations on Federal minerals that are within this opportunity area. When minerals are privately owned, consultation with the USFWS will be undertaken to minimize adverse effects on habitat. Also refer to mandatory standards in Appendix K.</p> <p><i>Concern:</i> Move to FW. Need to delete reference to Appendix K, which no longer exists in the revised plan. The first two sentences are two separate issues that should be addressed separately. Privately owned mineral direction should apply to all TEP species, not just VBEB, and we have to work with the permitting agencies to develop mitigation. Use of the word “consultation” in connection with private minerals is incorrect. Private mineral development is not a federal action, thus Section 7 consultation does not apply.</p>	<p>Replaced by FW TEP Species Standard TE17 - Surface occupancy shall not be allowed for mineral operations on federal minerals that are within 200 feet of hibernacula, maternity colonies, or bachelor colonies.</p> <p>Replaced by FW TEP Species Standard TE06 – When proposed exploration or development of privately owned mineral rights may adversely affect TEP species or habitat, the Forest shall work with state and federal mineral operation permitting agencies to mitigate adverse effects.</p> <p><i>Rationale:</i> OA 837 and Appendix K no longer exist. See also concerns comments opposite.</p>
<p>OA 837 S&G – 2800 Minerals and Geology Shot detonation and ground vibration generally will not be allowed within the opportunity area.</p> <p><i>Concern:</i> Move to FW. Shot detonation is not such a commonly used technique as it was 20 years ago. We need to tie this to seismic exploration, which generally has much less impact. The important point is that, whatever technique is used, adverse effects should be avoided.</p>	<p>Replaced by FW TEP Species Standard TE18 - Seismic exploration may be allowed within 200 feet of hibernacula, maternity colonies, or bachelor colonies if it can be demonstrated not to have an adverse impact on bat populations or habitat.</p> <p><i>Rationale:</i> OA 837 no longer exists. Clarifies that this activity is tied to seismic exploration, which may occur if there are no adverse effects to bats or habitat.</p>
<p>OA 837 S&G – 5100 Fire Management Give high priority to controlling forest fires to prevent bat asphyxiation or significant changes to the vegetative cover.</p> <p><i>Concern:</i> Not sure this is needed on the MNF, as fire suppression is pretty much a high priority everywhere.</p>	<p>Deleted</p> <p><i>Rationale:</i> See concern comments opposite. Also, we average less than 10 wildfires a year, and we’d like to introduce more prescribed fire into bat habitat to improve foraging habitat, so we don’t want to give the impression that fire is a huge threat.</p>

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<p>OA 837 S&G – 5400 Landownership Establish as high priority acquisition any caves inside the Monongahela Proclamation Boundary or Purchase Units, except commercially operated caves that are used by Virginia big-eared bats.</p> <p><i>Concern:</i> Worded awkwardly and not really a standard or guideline. Land acquisition direction belongs in the Lands section.</p>	<p>Replaced by FW Lands and Special Uses Guideline LS05 – Acquisitions of land and interests in lands should be guided by the following criteria:</p> <ul style="list-style-type: none"> a) Lands with water frontage such as lakes, rivers, and streams. b) Lands needed for protection of TEP fish, wildlife, or plant species. c) Other environmentally sensitive lands, such as important wetland and riparian areas and cave resources. d) Lands needed for protection of significant historical or cultural resources when these resources are threatened or when management may be enhanced by public ownership. e) Lands that enhance recreation opportunities, public access, and protection of aesthetic values. f) Lands needed for protection and management of administrative and congressionally designated areas. g) Lands needed to obtain more efficient land ownership patterns and reduce expenses of both the Forest Service and the public in administration and utilization. h) Lands with water rights or resources that can be used to accomplish management objectives or related resource obligations. i) Major corporate parcels that become available. j) Lands or partial interests needed to reunite or consolidate split estates. k) Lands or partial interests needed to achieve the objectives of public law or regulation. l) Lands needed to protect resource values by eliminating or reducing fire risks, soil erosion, or occupancy trespass. <p>Other acquisitions may be considered that promote more effective Forest management or benefit the priority acquisitions listed above.</p> <p><i>Rationale:</i> Items b and c address TEP species and caves in the context of overall land acquisition priorities.</p>
<p>OA 837 S&G – 6760 Safety 1. Dynamiting generally will not be conducted within the opportunity area of a Virginia big-eared cave.</p> <p><i>Concern:</i> Move to FW and rewrite to be more consistent with how we are addressing use of explosives for Indiana bat. We need to address all explosives, not just dynamite, and we should focus on avoiding adverse effects rather than blanket prohibitions. We also need to address potential effects of explosive use outside the 200-foot radius.</p>	<p>Replaced by FW TEP Species Standard TE19 - Explosives shall not be used within 200 feet of hibernacula, maternity colonies, or bachelor colonies unless analysis can demonstrate that this activity will not have an adverse effect on bat populations or habitat. Explosives outside of this area shall not be used when such use has potential to damage the cave or disturb the bat.</p> <p><i>Rationale:</i> See concerns outlined to the left.</p>
<p>OA 837 S&G – 6760 Safety 2. Dynamiting during maternity or hibernation periods could create a severe stress on these bats. Prohibit dynamiting near caves when the blast exceeds a peak</p>	<p>Deleted</p> <p><i>Rationale:</i> These formulae are just tools, not direction, and the most desirable tools or process may change over</p>

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<p>particle velocity of .02 inches per second at the site of the bat colonies. Several formulae are provided here to assist blasters determine safe limits. The formulae are taken from the 1977, Blasters Handbook published by DuPont.</p> <p>a. When distance from blast site to the bat colony is known and the weight of the dynamite is needed:</p> $W = \frac{(R^{1.6} \times V)}{(160)}^{1.25}$ <p>b. When pounds of dynamite is known and the distance from blast site to colony is needed:</p> $R = \frac{(160 \times W^{.8})^{.63}}{(V)}$ <p>c. When peak particle velocity is needed and distance from colony to blast site and pounds of dynamite are known:</p> $V = 160 \frac{(R)^{-1.6}}{(W^{1/2})}$ <p>or</p> $V = 160 \frac{(R)^{.63}}{(W^{.8})}$ <p>Where: V = peak particle velocity in inches per second. R = distance between blast site and colony site in the cave. W = Maximum pounds of dynamite (or its equivalent) per delay period of eight (8) milliseconds or more.</p> <p><i>Concern:</i> These formulae are just tools, not direction. And no one but a blaster would even know what they are.</p>	<p>time. They also apparently apply only to dynamite without acknowledging that other explosives could be used. The mineral permittee may use formulae such as these to meet the intent of Standard TE19, but he should be allowed to use other equivalent or acceptable methods as well. Use of dynamite is not nearly as common a practice as it once was, with the advent of other technologies.</p>
<p>OA 837 S&G – 7710 Transportation Planning Transportation routes should avoid the opportunity area.</p> <p><i>Concern:</i> Need to replace “opportunity area” with area of concern. Need to specify that this applies to new routes. Technically, existing or past routes can’t avoid anything if it’s already along their path, but new construction of routes could.</p>	<p>Replaced by FW TEP Species Standard TE20 – New road or trail construction shall be prohibited within 200 feet of hibernacula, maternity colonies, or bachelor colonies.</p> <p><i>Rationale:</i> OA 837 will no longer exist. Clarified that this applies to new routes, not every existing or past route.</p>
<p>OA 837 S&G – 7710 Transportation Planning Roads and trails leading to hibernacula may be blocked or obliterated to further discourage access.</p> <p><i>Concern:</i> Need to replace phrases like “may be blocked” and “further discourage”. This is weak direction. We already have the authority and ability to make these sorts of decisions at the site level without plan direction, but if we really want to reduce road or trail-related impacts, we need direction restricting new road or trail construction.</p>	<p>Replaced by FW TEP Species Standard TE20 – New road or trail construction shall be prohibited within hibernacula.</p> <p><i>Rationale:</i> See concern comments, opposite. The T&E Amendment direction was not needed as much as direction regarding new road or trail construction.</p>
<p>Essential Habitat for Indiana Bat (Opportunity Area 838)</p>	<p>Replaced by Indiana Bat Hibernacula, Key Areas, and Maternity Sites <i>Rationale:</i> OA 838 no longer exists.</p>
<p>OA 838 General – Indiana Bat Important habitat for Indiana Bat (<i>Myotis sodalis</i>) will be</p>	<p>Replaced by FW TEP Species Goal TE01 - Provide habitat capable of contributing to the survival and</p>

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<p>managed in order to protect and enhance the population of this species.</p> <p><i>Concern:</i> This direction should be covered FW for all TEP species, rather than having to say it for each species.</p>	<p>recovery of species listed under the ESA. Provide habitat that may help preclude Proposed species from becoming listed.</p> <p>See also all standards/guidelines for Indiana bat habitat.</p> <p><i>Rationale:</i> Goal TE01 says much the same thing as the Amendment but in a more positive and proactive statement about what we want to do and why. Specific protections are provided by standards applied to its habitat.</p>
<p>OA 838 S&G – 1500 External Relations Project activities in these areas will require consultation with the U. S. Department of the Interior Fish and Wildlife Service (USFWS). The West Virginia Division of Natural Resources (WVDNR) will be kept informed of activities.</p> <p><i>Concern:</i> Consultation requirements are established by the ESA and its implementing regulations, not by the Forest Plan. Consultation should be based largely on the potential effects of the activity rather than the area in which it occurs.</p>	<p>Covered in the Introduction to the FW TEP Species section - Section 7 consultation will occur at the project level for all proposed actions that may affect these species or their habitat.</p> <p><i>Rationale:</i> This statement covers our consultation requirement at the FW level without appearing to supplement or change the consultation process as it is defined by ESA regulations. We do not have to repeat it for each individual species, MP, or OA.</p>
<p>OA 838 S&G – 1600 Information Cave entrances will be signed and posted against entry. Signs may include USFWS and WVDNR authorities. Although signed at cave entrances, caves will not be located on maps published for distribution to the public. No directional signs on roads or trails will be posted directing people to these caves.</p> <p><i>Concern:</i> No serious problems here, but it contains a bit more process detail than we need in a strategic planning document.</p>	<p>Replaced by FW TEP Standard TE43 for Indiana bat hibernacula – Public entry into hibernacula shall be prohibited from September 1 to May 15.</p> <p><i>Rationale:</i> Removed process detail and reworded for clarity. However, we recently realized that the wording of TE43 is too inflexible to accommodate our current management strategy of leaving minor hibernacula open. Therefore, for the final plan we intend to reword TE43 as follows: Prohibit public entry into caves and mines used as major hibernacula from September 1 to May 15. Minor hibernacula that harbor very few individuals in most years may remain open to the public if the Forest, USFWS, and WVDNR agree that public entry would be extremely unlikely to cause harm or mortality of Indiana bats.</p>
<p>OA 838 S&G – 1900 Vegetation 1. Management of vegetation that is less than 5” in diameter generally may occur in the opportunity area during any time of the year, provided adverse disturbance to bats can be avoided.</p> <p><i>Concern:</i> Move to FW. Need to replace “opportunity area” with areas of concern.</p>	<p>Replaced by FW TEP Species Standard TE40 - Management of vegetation that is less than 5” dbh generally may occur within 200 feet of the hibernacula, key areas, or within two miles of known maternity sites during any time of the year, provided adverse disturbance to bats is avoided.</p> <p><i>Rationale:</i> Opportunity areas no longer apply, and these are the areas of concern.</p>
<p>OA 838 S&G – 1900 Vegetation 2. Management of vegetation 5” dbh or greater may be implemented within 200 feet of the hibernacula, the key areas of Indiana bats or within two miles of their maternity site, but only to improve or enhance Indiana bat</p>	<p>Replaced by FW TEP Species Standard TE41 – Management of vegetation 5 inches dbh or greater may only be implemented within 200 feet of hibernacula or within key areas to:</p> <p>a) Maintain or improve Indiana bat or other TEP</p>

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<p>habitat or for public safety. Activities driven by other legal requirements (e.g. access to private lands) may be allowed after consultation with USFWS and a site-specific analysis determines that there are no other reasonable alternatives. Also, see OA 838 standards for 2400 (Timber Management) and 2670 (Wildlife) that are related to vegetation management.</p> <p><i>Concern:</i> Need to delete OA and FSM references.</p>	<p>species habitat, b) Address public or worker safety concerns, or c) Achieve research objectives.</p> <p><i>Rationale:</i> Deleted outmoded OA and FSM references because OA no longer exists. Reworded for clarity and to include research as a potential reason for vegetation management. Other legal requirements such as access to landlocked private land override Forest Plan direction and do not need to be listed here.</p>
<p>OA 838 S&G – 1950 NEPA 1. Standards and Guidelines listed here are minimal. Others may be added as appropriate when designating each new opportunity area for these bats.</p> <p><i>Concern:</i> We shouldn't need new S&Gs each time we find a new hibernaculum or maternity colony. We may need site-specific mitigation, but that's already covered FW.</p>	<p>Deleted</p> <p><i>Rationale:</i> We may develop management plans with site-specific mitigation or project-related mitigation, but let's not infer that we will be creating new standards and guidelines for the Plan every time we find a new maternity site or hibernaculum. That could require a plan amendment every time we do.</p>
<p>OA 838 S&G – 1950 NEPA 2. Opportunity areas will be defined as: a. Indiana bat hibernacula (caves and an area at least 200 feet in radius from cave entrances and key areas (area near hibernacula that includes mature stands); and/or b. Land within two miles of a maternity site for the Indiana bat, unless consultation with the USFWS on a site-specific basis indicates otherwise.</p> <p><i>Concern:</i> This is not direction, just a definition.</p>	<p>Deleted</p> <p><i>Rationale:</i> There are no more Opportunity Areas. This is a definition, not direction, and has been incorporated into the glossary. Most of the Standards and Guidelines that apply to hibernacula mention the 200-foot buffer around the caves.</p>
<p>OA 838 S&G – 1950 NEPA 3. Standards for Management Areas 2.0, 3.0, 4.0, 6.1, and 7.0 (areas from which OA 838 may be derived) will continue to apply unless inconsistent with OA 838 standards for Indiana bat.</p> <p><i>Concern:</i> OA 838 is going away.</p>	<p>Deleted</p> <p><i>Rationale:</i> OA 838 no longer exists. Direction has been moved to FW. All FW direction overlays the MPs and allows MP direction to apply unless the FW direction is more restrictive.</p>
<p>OA 838 S&G – 1950 NEPA 4. OA 838 will not be created from MP 5.0, 6.2, or other 8.0 areas. OA 838 standards will be applied to MP 5.0, 6.2, or other 8.0 acres near hibernacula or within key areas but only to the extent that they are consistent with the Wilderness Act or the standards for these three Management Areas.</p> <p><i>Concern:</i> OA 838 is being eliminated.</p>	<p>Deleted</p> <p><i>Rationale:</i> OA 838 no longer exists. Direction has been moved to FW. . All FW direction overlays the MPs and allows MP direction to apply unless the FW direction is more restrictive.</p>
<p>OA 838 S&G – 2150 Pesticide Use 1. Limit use of pesticides in these areas.</p> <p><i>Concern:</i> Need to better define what we mean by "limit". Also, protections apply to more than just Indiana bat primary range.</p>	<p>Replaced by FW Vegetation Guideline VE23 – Where pest problems occur, the selection of corrective measures should take into account management objectives, effectiveness, safety, environmental protection, and cost.</p> <p>Replaced by FW Vegetation Guideline VE32 – During environmental analysis for pesticide use, other reasonable alternatives should be evaluated to achieve the purpose and need of the project.</p>

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	<p>Replaced by FW Vegetation Guideline VE34 – Use application techniques that provide proper pesticide placement on the target area or species. Low pressure spray equipment is preferred.</p> <p><i>Rationale:</i> “Limit use” doesn’t really provide much direction. Use is limited across the entire Forest, and limitations are covered by FW direction in Vegetation section. Any proposal for use in TEP habitat would have to undergo analysis and consultation with USFWS.</p>
<p>OA 838 S&G – 2300 Recreation No new facilities will be constructed for public recreation use at hibernacula or within key areas (see 2670).</p> <p><i>Concern:</i> Make FW. Change “will” to “shall” for consistency.</p>	<p>Replaced by FW TEP Species Standard TE42 – No new facilities shall be constructed for public recreation use at hibernacula or within key areas.</p> <p><i>Rationale:</i> Made FW, as OA 838 will no longer exist. Changed “will” to “shall” for consistency.</p>
<p>OA 838 S&G – 2400 Timber Commercial timber harvest may not occur within 200 feet of hibernacula. Commercial timber harvests may occur within key areas and within two miles of maternity sites only if used as a tool to enhance Indiana bat habitat.</p> <p><i>Concern:</i> We do not need a separate standard for commercial timber sales when we already have standards that address commercial-sized (5” dbh or greater) vegetation management in hibernacula, key areas, and primary range. Also, the 2-mile restriction for maternity sites does not allow for site-specific considerations. Maternity sites may not be used for the long term; changing the purpose of timber management is a long-term vegetation management strategy that seems ill-suited for managing a potentially short-term resource concern.</p>	<p>Covered by FW TEP Species Standard TE41 - Management of vegetation 5 inches dbh or greater may only be implemented within 200 feet of hibernacula or within key areas to:</p> <ul style="list-style-type: none"> d) Maintain or improve Indiana bat or other TEP species habitat, e) Address public or worker safety concerns, or f) Achieve research objectives. <p>Covered by FW TEP Species Standard TE25 – If a maternity site is discovered, establish a buffer centered on the site. The buffer, not to exceed a 2-mile radius, shall be determined by a combination of topography, known roost tree locations, proximity of permanent water, and a site-specific evaluation of the habitat characteristics associated with the colony. Protective measures for potential or confirmed maternity colonies shall be determined at a site-specific level in cooperation with USFWS and WVDNR.</p> <p>See also Standard TE29 for primary range.</p> <p><i>Rationale:</i> This combination of direction protects all of the important features while still allowing site-specific flexibility in protecting maternity colonies.</p>
<p>OA 838 S&G – 2670 TEP Species Management 1. Provide adequate water sources by creating or maintaining between 1 and 4 water sources per square mile.</p> <p><i>Concern:</i> This direction already exists and is better written in the Management Prescription areas. See MP example opposite. As written, this direction could compel us to go out a create water sources everywhere in key areas, hibernacula, and maternity colony buffers, whether or not we are conducting other resource management in the area. For cost efficiency, artificial</p>	<p>Replaced by MP 3.0 Goal 3015, MP 4.1 Goal 4131, MP 6.1 Goal 6134 - Maintain natural areas of standing water as wildlife watering sources. Create artificial water sources as needed in conjunction with other resource activities.</p> <p><i>Rationale:</i> The pools are provided for wildlife in general, not just bats. As far as “water sources” go, there are typically more than 1-4 natural streams, seeps, bogs, etc. per square mile right now, without us having to provide more.</p>

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water sources generally are constructed in conjunction with timber management.	
<p>OA 838 S&G – 2670 TEP Species Management 2. Hibernacula (Caves and an area at least 200 feet in radius from cave entrances).</p> <p><i>Concern:</i> The first sentence is description, not direction.</p>	<p>Deleted</p> <p><i>Rationale:</i> This is a definition, not direction. OA 838 will no longer exist.</p>
<p>OA 838 S&G – 2670 TEP Species Management a. Public entrance into caves used as hibernacula for Indiana bat will be prohibited from September 1 to May 15.</p> <p><i>Concern:</i> Need to make FW.</p>	<p>Replaced by FW TEP Species Standard TE43 - Public entry into hibernacula shall be prohibited from September 1 to May 15.</p> <p><i>Rationale:</i> Made FW. Tightened wording. However, we recently realized that the wording of TE43 is too inflexible to accommodate our current management strategy of leaving minor hibernacula open. Therefore, for the final plan we intend to reword TE43 as follows: Prohibit public entry into caves and mines used as major hibernacula from September 1 to May 15. Minor hibernacula that harbor very few individuals in most years may remain open to the public if the Forest, USFWS, and WVDNR agree that public entry would be extremely unlikely to cause harm or mortality of Indiana bats.</p>
<p>OA 838 S&G – 2670 TEP Species Management b. Entry into caves during the closed periods for scientific study and observation will be permitted by written approval of the Forest Supervisor and permit from the USDI, USFWS, or equivalent.</p> <p>No major concerns; could tighten the wording a little. Can convert this to a FW standard that applies to all caves that are closed for whatever reason.</p>	<p>Replaced by FW TEP Species Standard TE07 – Cave entry during closed periods for scientific study and observation may be permitted by Forest Supervisor’s written approval and permit from USFWS or delegated authority.</p> <p><i>Rationale:</i> Minor wording changes for clarity and ease of reading. Converted to a FW standard that applies to all caves that are closed for whatever reason.</p>
<p>OA 838 S&G – 2670 TEP Species Management c. Gates or fences installed at cave entrances will allow free entry and exit by the bats and will not restrict normal airflows.</p> <p><i>Concern:</i> Change “will” to “shall” for consistency. Make FW as this is just a repeat of VBEB direction.</p>	<p>Moved to FW TEP Species Standard TE08 - Gates or fences installed at cave entrances shall allow free entry and exit by TEP species and shall not restrict normal airflows.</p> <p><i>Rationale:</i> OA 838 will no longer exist. Changed “will” to “shall” for consistency.</p>
<p>OA 838 S&G – 2670 TEP Species Management Gate installation that disturbs a cave feature or floor must have an archaeological survey prior to disturbance.</p> <p><i>Concern:</i> Need to move to FW.</p>	<p>Moved to FW TEP Species Standard TE09 - Gate installation that disturbs a cave feature or floor must have an archaeological survey prior to disturbance.</p> <p><i>Rationale:</i> OA 838 will no longer exist.</p>
<p>OA 838 S&G – 2670 TEP Species Management Gate installation must conform to requirements of applicable State laws and regulations.</p> <p><i>Concern:</i> Do not need to say we will follow state law.</p>	<p>Deleted</p> <p><i>Rationale:</i> Unneeded. We have to follow any applicable state laws and regulations.</p>
<p>OA 838 S&G – 2670 TEP Species Management</p>	<p>Replaced by FW TEP Species Standard TE10 - Gates</p>

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<p>f. Gates and fences will be monitored and maintained. Frequency of monitoring should be scheduled based on past cave visits, vandalism history, access, and other conditions of potential gate disturbances. A schedule of at least once a month is recommended. Maintenance and repair of gates should be undertaken within reasonable time from vandalism discovery during the period of closure (generally within two weeks).</p> <p><i>Concern:</i> The “at least once a month” schedule is not very likely given our current level of staffing and budget.</p>	<p>and fences shall be monitored and maintained. Base monitoring frequency on past cave visits, access, and potential for disturbance.</p> <p><i>Rationale:</i> The appropriate frequency of monitoring and maintenance can be determined through criteria listed above without tying monitoring frequency to an arbitrary interval that we may not be able to meet.. Moved to FW because OA 838 will no longer exist.</p>
<p>OA 838 S&G – 2670 TEP Species Management Prohibit any construction or permanent type of activities at cave entrances unless created for the protection of Indiana bats, protection of other cave resources, or for public safety.</p> <p><i>Concern:</i> This is already covered elsewhere.</p>	<p>Deleted</p> <p><i>Rationale:</i> We have already described the construction and activities that we want to see restricted in FW standards and guidelines TE40 through TE53, each of which is discussed elsewhere in this document.</p>
<p>OA 838 S&G – 2670 TEP Species Management 3. Key Area</p> <p>a. Protect the surface surrounding each Indiana bat hibernacula by maintaining mature stands near hibernacula that include a minimum of 150 acres. When available, this area should include 20 acres of old growth forest or potential old growth and an additional 130 acres of mature forest. As appropriate, the area should include the area around the cave entrance, area above the known cave entrance, foraging corridor, and ridge tops/side slopes around the cave.</p> <p><i>Concern:</i> This is more of a description than direction.</p>	<p>Replaced by FW TEP Species Guideline TE51 – A key area should be contiguous and located as close to the cave as possible. Where available, this area should include 20 acres of late successional forest, and an additional 130 acres of mid-to-late successional or late successional forest.</p> <p><i>Rationale:</i> Rewrote description as a guideline because we need some flexibility in determining these areas based on site-specific conditions. Protection is provided in standards and guidelines noted below.</p>
<p>OA 838 S&G – 2670 TEP Species Management b. Construction or other permanent activities generally will be prohibited in key areas unless needed to protect or enhance habitat for Indiana bats or for public safety.</p> <p><i>Concern:</i> “Generally will be prohibited” is weak direction. We are maintaining or improving habitat in other similar direction. OA 838 is going away.</p>	<p>Replaced by FW TEP Species Standard TE44 – Construction or other permanent activities may only occur in key areas if they maintain or improve habitat or provide for public safety.</p> <p><i>Rationale:</i> Rewrote for clarity and consistency. Made FW, as OA 838 will no longer exist.</p>
<p>OA 838 S&G – 2700 Special Uses 1. Special use permits will not be issued within Indiana bat hibernacula.</p> <p><i>Concern:</i> Change “will” to “shall” for consistency.</p>	<p>This standard was unintentionally omitted in the proposed plan. We intend to include it in the final plan as follows: Special use permits shall not be issued within Indiana bat hibernacula unless it can be demonstrated that they will not adversely affect the Indiana bat or its habitat.</p> <p><i>Rationale:</i> Changed “will” to “shall” for consistency.</p>
<p>OA 838 S&G – 2700 Special Uses 2. Special use permits may be issued within key areas and within two miles of maternity sites only if they are compatible with Indiana bat management.</p> <p><i>Concern:</i> Needs to be FW. “Compatible with IB management” is a little vague.</p>	<p>Replaced by FW TEP Species Standard TE45 - Special use permits occurring within key areas and within two miles of maternity sites may be authorized but shall be evaluated on a case-by-case basis.</p> <p><i>Rationale:</i> Made FW and rewrote for clarity. However, as written, it eliminates the vague term “compatible”</p>

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	without substituting anything in its place. We plan to rewrite this standard as follows in the final plan: Special use permits occurring within key areas and within 2 miles of maternity sites may be authorized if they are compatible with Indiana bat population maintenance or recovery.
<p>OA 838 S&G – 2800 Minerals and Geology 1. Surface occupancy will not be permitted for mineral operations on Federal minerals at hibernacula, within key areas, or within two miles of maternity sites.</p> <p><i>Concern:</i> Prohibition within 2 miles of maternity sites seems excessive. Need to clarify that this applies to proposed new mineral operations and not existing operations. Needs to be FW.</p>	<p>Replaced by FW TEP Species Standard TE49 - Surface occupancy for proposed federal mineral operations shall not be allowed at hibernacula or within key areas.</p> <p>Replaced by FW TEP Species Guideline TE52 - Surface occupancy for proposed federal mineral operations within 2 miles of maternity sites should be evaluated on a case-by-case basis.</p> <p><i>Rationale:</i> Made FW. Separated out the maternity site direction. Surface occupancy that far from a site should be analyzed for effects, because there may not be any. Clarified that this applies to proposed operations.</p>
<p>OA 838 S&G – 2800 Minerals and Geology 2. When minerals are privately owned, consultation with the USFWS will be undertaken to minimize adverse effects on habitat.</p> <p><i>Concern:</i> Use of the word “consultation” in connection with private minerals is incorrect. Private mineral development is not a federal action, thus Section 7 consultation does not apply. Privately owned mineral direction should apply to all TEP species, not just VBEB, and we have to work with the permitting agencies to develop mitigation.</p>	<p>Replaced by FW TEP Species Standard TE06 – When proposed exploration or development of privately owned mineral rights may adversely affect TEP species or habitat, the Forest shall work with state and federal mineral operation permitting agencies to mitigate adverse effects.</p> <p><i>Rationale:</i> This FW direction addresses private minerals in a more accurate way. We do not have control over operations to any extent where we can avoid or minimize effects, so we work with the permitting agencies to mitigate effects where possible.</p>
<p>OA 838 S&G – 2800 Minerals and Geology Shot detonation and ground vibration generally will not be initiated within hibernacula, within key areas, or within two miles of maternity sites.</p> <p><i>Concern:</i> Need to tie this to seismic exploration. Change to FW. “Generally will not” is weak direction. We do not know that ground vibration 2 miles from a maternity site will have an adverse effect.</p>	<p>Replaced by FW TEP Species Standard TE46 – Seismic exploration may be allowed within hibernacula, within key areas, or within 2 miles of maternity sites if analysis can demonstrate it would not have an adverse impact on bat populations or habitat.</p> <p><i>Rationale:</i> Clarified that this activity is tied to seismic exploration, and that exploration is allowed if adverse effects can be avoided. Made FW.</p>
<p>OA 838 S&G – 5100 Fire Management 1. Give high priority to controlling forest fires to prevent bat asphyxiation or significant changes to the vegetative cover.</p> <p><i>Concern:</i> Not sure this is needed on the MNF, as fire suppression is pretty much a high priority everywhere.</p>	<p>Deleted</p> <p><i>Rationale:</i> See concern comments opposite. Also, we average less than 10 wildfires a year, and we’d like to introduce more prescribed fire into bat habitat to improve foraging habitat, so we don’t want to give the impression that fire is a huge threat.</p>
<p>OA 838 S&G – 5100 Fire Management Burn plans for prescribed fires within the primary range will include a smoke management plan that minimizes the duration of smoke in the area, and maximizes smoke dispersion from the area.</p>	<p>Replaced by FW Fire Management Standard FM12 - A prescribed burning plan must be prepared and approved prior to using prescribed fire as a management tool. The plan shall address protection or maintenance of TEP species and habitat, cultural resources, watershed resources, air quality, private property, and other</p>

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<p><i>Concern:</i> This is already covered in FW direction. Plus, all burn plans are supposed to be designed to minimize smoke duration and maximize dispersion.</p>	<p>resources or investments as needed or appropriate.</p> <p><i>Rationale:</i> Revised FW version covers all TEP species and clarifies that mitigation for TEP species or habitats may be needed or appropriate in any burn plan.</p>
<p>OA 838 S&G – 5400 Landownership Establish as high priority acquisition any caves inside the Monongahela Proclamation Boundary or Purchase Units, except commercially operated caves that are used by Indiana bats.</p> <p><i>Concern:</i> Worded awkwardly and not really a standard or guideline. Not really needed, either.</p>	<p>Deleted</p> <p><i>Rationale:</i> We don't really need this because we have established priorities for land acquisition under the Lands section, and 2 of the first 3 priorities are for T&E habitat and caves.</p> <p>FW Lands Guideline LS05 – Acquisitions of land and interests in lands should be guided by the following criteria:</p> <ul style="list-style-type: none"> a) Lands with water frontage such as lakes, rivers, and streams, b) Lands needed for protection of TEP fish, wildlife, or plant species, c) Other environmentally sensitive lands, such as important wetland and riparian areas and cave resources...
<p>OA 838 S&G – 6760 Safety 1. Dynamiting during maternity or hibernation periods could create a severe stress on these bats. Prohibit dynamiting near caves when the blast exceeds a peak particle velocity of .02 inches per second at the site of the bat colonies. Several formulae are provided here to assist blasters determine safe limits. The formulae are taken from the 1977, Blasters Handbook published by DuPont.</p> <p><i>Concern:</i> This piece of direction and the piece below are reversed compared to the same direction for VBEB. Needs to be generalized to cover all explosives, not just dynamite. Too much focus on process details rather than the outcome we're trying to achieve, which is no adverse effects.</p>	<p>Replaced by FW TEP Species Standard TE47 - Explosives shall not be used within hibernacula, key areas, or active maternity sites, unless analysis can demonstrate that this activity will not have an adverse effect on bat populations or habitat. Explosives outside of this area shall not be used when such use has potential to damage the cave or disturb the bat.</p> <p><i>Rationale:</i> These formulae are just tools, not direction. The rewritten standard focuses on achieving no adverse effect. This is consistent with how direction has been rewritten for VBEB.</p>
<p>OA 838 S&G – 6760 Safety 2. Dynamiting generally will not be conducted within two miles of a maternity colony.</p> <p><i>Concern:</i> Need a little more flexibility here. Low level use of explosives a mile or more away, on the other side of a ridge, would not likely have any adverse effect.</p>	<p>Replaced by FW TEP Species Standard TE47 - Explosives shall not be used within hibernacula, key areas, or active maternity sites, unless analysis can demonstrate that this activity will not have an adverse effect on bat populations or habitat. Explosives outside of this area shall not be used when such use has potential to damage the cave or disturb the bat.</p> <p><i>Rationale:</i> The rewritten standard focuses on achieving no adverse effect. This is consistent with how dynamiting direction has been rewritten for VBEB bat areas.</p>
<p>3. When distance from blast site to the bat colony is known and the weight of the dynamite is needed:</p> $W = \frac{(R^{1.6} \times V)^{1.25}}{(160)}$	<p>Deleted</p> <p><i>Rationale:</i> These formulae are just tools, not direction, and the most desirable tools or process may change over time. They also apparently apply only to dynamite without acknowledging that other explosives could be</p>

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	used. The mineral permittee may use formulae such as these to meet the intent of Standard TE47, but he should be allowed to use other equivalent or acceptable methods as well. Use of dynamite is not nearly as common a practice as it once was, with the advent of other technologies.
<p>4. When pounds of dynamite is known and the distance from blast site to colony is needed:</p> $R = \frac{(160 \times W^{.8})^{.63}}{(V)}$	<p>Deleted</p> <p><i>Rationale:</i> These formulae are just tools, not direction, and the most desirable tools or process may change over time. They also apparently apply only to dynamite without acknowledging that other explosives could be used. The mineral permittee may use formulae such as these to meet the intent of Standard TE47, but he should be allowed to use other equivalent or acceptable methods as well. Use of dynamite is not nearly as common a practice as it once was, with the advent of other technologies.</p>
<p>5. When peak particle velocity is needed and distance from colony to blast site and pounds of dynamite are known:</p> $V = 160 \frac{(R)^{-1.6}}{(W^{1/2})}$ <p>or</p> $V = 160 \frac{(R)^{.63}}{(W^{.8})}$ <p>Where: V = peak particle velocity in inches per second. R = distance between blast site and colony site in the cave. W = Maximum pounds of dynamite (or its equivalent) per delay period of eight (8) milliseconds or more.</p> <p><i>Concern:</i> These formulae are just tools, not direction. And no one but a blaster would even know what they are.</p>	<p>Deleted</p> <p><i>Rationale:</i> These formulae are just tools, not direction, and the most desirable tools or process may change over time. They also apparently apply only to dynamite without acknowledging that other explosives could be used. The mineral permittee may use formulae such as these to meet the intent of Standard TE47, but he should be allowed to use other equivalent or acceptable methods as well. Use of dynamite is not nearly as common a practice as it once was, with the advent of other technologies.</p>
<p>OA 838 S&G – 7710 Transportation Planning Transportation routes should avoid hibernacula, key areas, and maternity sites.</p> <p><i>Concern:</i> Need to specify that this applies to new routes, rather than existing routes. Otherwise, this standard could commit us to relocating all routes within or near these features. Suggest using a guideline for key areas and maternity sites, which might change over time based on habitat changes (key areas) or changes in bat use (maternity colonies, and a standard for hibernacula, which are likely to see continuous bat use over the long term. This could provide us with a little more flexibility to deal with needed improvements or non-discretionary actions in areas that bats may be using in the future.</p>	<p>Replaced by FW TEP Species Standard TE48 - New road or trail construction shall be prohibited within hibernacula.</p> <p>Replaced by FW TEP Species Guideline TE53 - New road or trail construction should avoid key areas and maternity sites.</p> <p><i>Rationale:</i> Clarified that this direction applies to new routes, not every existing or past route. Also separated into a standard for hibernacula, and a guideline for key areas and maternity sites, which could be anywhere.</p>
<p>OA 838 S&G – 7710 Transportation Planning Roads and trails leading to hibernacula may be blocked or obliterated to further discourage access.</p>	<p>Replaced by FW TEP Species Standard TE48 – New road or trail construction shall be prohibited within hibernacula.</p>

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<p><i>Concern:</i> Need to replace phrases like “may be blocked” and “further discourage”. This is weak direction. We already have the authority and ability to make these sorts of decisions at the site level without plan direction, but if we really want to reduce road or trail-related impacts, we need direction restricting new road or trail construction.</p>	<p><i>Rationale:</i> See concern comments, opposite. The T&E Amendment direction was not needed as much as direction regarding new road or trail construction.</p>
<p>Occupied Habitat for WV Northern Flying Squirrel (Opportunity Area 832)</p>	<p>Replaced by FW TEP Species WV Northern Flying Squirrel <i>Rationale:</i> Opportunity Area 832 is going away.</p>
<p>OA 832 General Important habitat for West Virginia Northern Flying Squirrels (<i>Glaucomys sabrinus fuscus</i>) will be managed to protect and enhance the population until it becomes viable.</p> <p><i>Concern:</i> This should be covered FW for all TEP species, rather than having to say it for each species.</p>	<p>Replaced by FW TEP Species Goal TE01 - Provide habitat capable of contributing to the survival and recovery of species listed under the ESA. Provide habitat that may help preclude Proposed species from becoming listed.</p> <p>See also all standards for WVNFS habitat.</p> <p><i>Rationale:</i> Goal TE01 says much the same thing as the Amendment but in a more positive and proactive statement about what we want to do and why. Specific protections are provided by standards applied to its habitat.</p>
<p>OA 832 S&G – 1500 External Relations 1. A map of suitable habitat will be collaboratively produced with by USFS, USDI Fish and Wildlife Service (USFWS) and West Virginia Division of Natural Resources (WVDNR). This map will be based on the best scientific and commercial data available and will include all verified capture sites of West Virginia northern flying squirrel. This map may be reviewed periodically and will be refined when USDA Forest Service (USFS) biologists determine that suitable habitat may be present in a project or analysis area and may be affected.</p> <p><i>Concern:</i> Needs to be reworded somewhat to reflect that the map has already been produced, and is going to be used to determine suitable habitat. Needs to be FW.</p>	<p>Replaced by FW TEP Species Standard TE60 - Suitable habitat shall be determined using the map collaboratively produced by the Forest, USFWS, and WVDNR. This map shall be reviewed during watershed or project analysis and refined when Forest, USFWS, and WVDNR biologists determine that suitable habitat is or is not be present. All verified capture sites shall be included in the suitable habitat map.</p> <p><i>Rationale:</i> Reworded to reflect that the map has already been produced. Changed “will” to “shall” since this is a standard. Made FW as OA 832 will no longer exist.</p>
<p>OA 832 S&G – 1500 External Relations Project activities in these areas will require consultation with USFWS. WVDNR will be kept informed of activities.</p> <p><i>Concern:</i> Consultation requirements are established by the ESA and its implementing regulations, not by the Forest Plan. Consultation should be based largely on the potential effects of the activity rather than the area in which it occurs.</p>	<p>Covered in the Introduction to the FW TEP Species section - Section 7 consultation will occur at the project level for all proposed actions that may affect these species or their habitat.</p> <p><i>Rationale:</i> This statement covers our consultation requirement without appearing to supplement or change the consultation process as it is defined by ESA regulations. We do not have to repeat it for each individual species, MP, or OA.</p>
<p>OA 832 S&G – 1900 Vegetation 1. On a limited, case-by-case basis, vegetation management in suitable habitat will be conducted only after consultation with the USFWS, and:</p> <ol style="list-style-type: none"> a. for public safety, or b. under an Endangered Species Act Section 10 	<p>Replaced by FW TEP Species Standard TEP 61 - Suitable habitat shall be considered occupied. Vegetation management activities in suitable habitat shall only be conducted after consultation with the USFWS, and:</p> <ol style="list-style-type: none"> a) Under an Endangered Species Act Section 10 research permit to determine the effects of an

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<p>research permit to determine the affects of an activity on West Virginia northern flying squirrel and to determine activities that would contribute to the recovery of the species, or</p> <p>c. to improve or enhance West Virginia northern flying squirrel habitat, or</p> <p>d. for the preservation, or enhancement of other threatened and endangered species habitat, or</p> <p>e. when part of allowed activities where project level analysis results in a no effect or may affect, not likely to adversely affect determination (for example activities allowed under OA 832 standards 2300, 2800.</p> <p><i>Concern:</i> Need to delete or change reference to OA standards, which will no longer be in an OA. Need to clarify that management under item c (habitat improvement) must be preceded by item b (research to establish effective habitat management methods). Need to include management to address safety concerns.</p>	<p>activity on WVNFS or to determine activities that would contribute to the recovery of the species, or</p> <p>b) To improve or maintain WVNFS or other TEP species habitat after research has demonstrated the beneficial effects of the proposed management, or</p> <p>c) When project-level assessment results in a no effect or may affect, not likely to adversely affect determination , or</p> <p>d) To address public safety concerns.</p> <p><i>Rationale:</i> Deleted reference to OA standards, which will no longer be in an OA. Added introductory statement to explain that suitable habitat is considered occupied. Added management for safety and clarified relationship between research and subsequent habitat enhancement.</p>
<p>OA 832 S&G – 1950 NEPA</p> <p>1. Opportunity areas will be defined as: National Forest System lands that provide suitable habitat characteristics consistent with the Guidelines for Habitat Identification and Management found in the Recovery Plan for Appalachian Northern Flying Squirrels, unless consultation with the USFWS on a site-specific basis indicates otherwise.</p> <p><i>Concern:</i> Opportunity Area 832 is going away.</p>	<p>Deleted</p> <p><i>Rationale:</i> There will be no Opportunity Areas. This is a definition, not direction. The definition of suitable habitat has been included in the glossary.</p>
<p>OA 832 S&G – 1950 NEPA</p> <p>2. All mapped suitable habitat will be considered as potentially occupied by the West Virginia northern flying squirrel, and emphasis will be placed on protecting this habitat.</p> <p><i>Concern:</i> This is written more as information than direction and does not seem appropriate as a stand-alone standard/guideline. Suggest incorporating into other direction. Also, “protecting” is a somewhat vague term for the management strategy we would like to apply to WVNFS habitat in order to promote recovery.</p>	<p>Incorporated into FW TEP Species Standard TEP 61</p> <p>- Suitable habitat shall be considered occupied. Vegetation management activities in suitable habitat shall only be conducted after consultation with the USFWS and...</p> <p>c) To improve or maintain WVNFS or other TEP species habitat after research has demonstrated the beneficial effects of the proposed management...</p> <p><i>Rationale:</i> Incorporated this direction into an existing standard. Rewrote for consistency and to emphasize that we want to maintain or improve the habitat to benefit the species, not just “protect” it.</p>
<p>OA 832 S&G – 1950 NEPA</p> <p>3. Standards for Management Areas 2.0, 3.0, 4.0, 6.1, and 7.0 (areas from which OA 832 may be derived) will continue to apply unless inconsistent with OA 832 standards for West Virginia northern flying squirrel.</p> <p><i>Concern:</i> OA 832 is being converted to FW direction.</p>	<p>Deleted</p> <p><i>Rationale:</i> OA 832 will no longer exist. Direction has been moved to FW. All FW direction overlays the MPs and allows MP direction to apply unless the FW direction is more restrictive.</p>
<p>OA 832 S&G – 1950 NEPA</p> <p>4. OA 832 will not be created from MP 5.0, 6.2, or other 8.0 areas. OA 832 standards will be applied to MP 5.0, 6.2, or other 8.0 acres that provide suitable habitat for</p>	<p>Deleted</p> <p><i>Rationale:</i> OA 832 will no longer exist. Direction has been moved to FW. All FW direction overlays the MPs</p>

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<p>West Virginia northern flying squirrel to the extent that they are consistent with the Wilderness Act or the standards for these three Management Areas.</p> <p><i>Concern:</i> OA 832 is being converted to FW direction.</p>	<p>and allows MP direction to apply unless the FW direction is more restrictive.</p>
<p>OA 832 S&G – 2300 Recreation No new developed facilities (such as visitor centers and campgrounds) will be constructed. Smaller facilities (such as foot trails, trailheads, picnic sites, ¼ acre vistas) may be constructed if compatible with West Virginia northern flying squirrel management.</p> <p><i>Concern:</i> Need to clarify what we mean by “compatible.” Needs to be FW.</p>	<p>Replaced by FW TEP Standard TE62 for WVNFS suitable habitat - New developed recreation facilities, such as visitor centers and campgrounds, shall not be constructed in suitable habitat. Smaller facilities--such as foot trails, trailheads, picnic sites, ¼ acre vistas--may be constructed if they result in a no effect or may affect, not likely to adversely affect determination.</p> <p><i>Rationale:</i> Replaces “compatible with WVNFS management” with solid measuring criteria that we can show we meet in a project-level BA. Made FW.</p>
<p>OA 832 S&G – 2400 Timber Commercial timber outputs will be incidental and subject to guidance under 1900.</p> <p><i>Concern:</i> This is already covered under Vegetation above in greater detail. Not sure why we need to say this here. FSM or FSH 1900 guidance does not have to be repeated or referenced.</p>	<p>Covered under FW TEP Species Standard TEP 61 - Suitable habitat shall be considered occupied. Vegetation management activities in suitable habitat shall only be conducted after consultation with the USFWS, and:</p> <ul style="list-style-type: none"> e) Under an Endangered Species Act Section 10 research permit to determine the effects of an activity on WVNFS or to determine activities that would contribute to the recovery of the species, or f) To improve or maintain WVNFS or other TEP species habitat after research has demonstrated the beneficial effects of the proposed management, or g) When project-level assessment results in a no effect or may affect, not likely to adversely affect determination , or h) To address public safety concerns. <p><i>Rationale:</i> Standard TE61 ensures that any timber outputs will be incidental to habitat management Timber harvest that does occur will be subject to all the laws, regulations, policies, and plan direction that we have to follow.</p>
<p>OA 832 S&G – 2700 Special Uses Special use permits may be issued if they are compatible with West Virginia northern flying squirrel management.</p> <p><i>Concern:</i> Need to replace vague commitment to be “compatible with WVNFS management”. Needs to be FW.</p>	<p>Replaced by FW TEP Species Standard TE63 - Special use permits may be authorized within WVNFS suitable habitat if the uses do not adversely affect WVNFS populations or habitat.</p> <p><i>Rationale:</i> Replaces “compatible with WVNFS management” with solid measuring criteria that we can show we meet in a project-level BA. Made FW.</p>
<p>OA 832 S&G – 2800 Minerals Development of federal gas would generally be allowed as long as (1) it remains within the limits projected in the 1991 Environmental Assessment Oil and Gas Leasing and Development and (2) if protection measures for West Virginia northern flying squirrel are developed through consultation with the USFWS prior to Forest Service approval of operations.</p>	<p>Replaced by FW TEP Species Standard TE64 - Development of federal gas and oil is generally allowed as long as: (1) it remains within the limits projected in the 1991 Environmental Assessment Oil and Gas Leasing and Development, and (2) protection measures for WVNFS are developed through consultation with the USFWS prior to Forest Service approval of operations.</p> <p><i>Rationale:</i> Slight wording changes for clarification.</p>

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<i>Concern:</i> Needs slight wording changes for clarification.	Made FW.

See also the Monongahela National Forest Proposed Land and Resource Management Plan, Chapter II, for the entire Forest-wide direction, desired conditions, and links.

Attachment:

**Region 9 Guidelines for Developing Forest Plan Management
Direction**

**Region 9 Core Planning Team
December 14, 2004**

Ted Geier, Regional Planning Hydrologist

Lead Author

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INTRODUCTION

The National Forest Management Act of 1976 (NFMA) requires each national forest to develop a forest plan that sets the rules, expectations, and sideboards for managing the forest. According to the implementing regulations (36 CFR 219.11), each forest plan must provide *management direction* that guides forest management throughout the planning cycle. Well-written management direction provides clear, concise, and easily implemented guidance to the field while poorly written direction can be cumbersome, confusing and contradictory.

The following guidelines were based on law, regulations, planning documents, and consultation with planners in Regions 1, 2, 4, 8, 9 and 10. They are designed to be consistent with the 1982 planning rule and the proposed revision of the planning rule (2003).

PRINCIPLES FOR DEVELOPING MANAGEMENT DIRECTION

Because the forest plan will be in place for many years and govern large areas, it should provide a strategic management framework that supports project-level decision making. Several principles should be observed:

1. The forest plan provides *strategic, programmatic* guidance. Site-specific, project-level guidance is more appropriate for technical guides or other sources that can be referenced in the forest plan.
2. Management direction should be integrated across program areas rather than simply compiled from various resource groups. Goals, objectives, standards and guidelines that have been developed independently by different specialists could be confusing, contradictory or unimplementable if not synthesized and integrated. Both the Forest Leadership Team (FLT) and the Interdisciplinary Team (IDT) should work to ensure this integration occurs within the planning process.
3. Forest plan management direction should maximize flexibility at the project level while meeting the intent of laws, regulations, and other legal authorities.
4. Forest plan management direction should be consistent with -- but not quote or explicitly repeat -- existing laws, regulations, executive orders, policies, or other higher-level direction. It is not appropriate to subject higher-level direction to public review and comment in the forest planning process. In addition, the forest plan might have to be amended if the quoted direction changes during the planning cycle.
5. In general, the forest plan should focus on *what* is to be done rather than the technical details of *how* to do it. It should emphasize the type of management practices that will be implemented on the ground rather than procedural guidance. The management direction prescribed by the forest plan falls into six general categories commonly called the "six forest plan decisions". These include:
 - Decision 1: Forest-wide multiple use goals and objectives (36 CFR 219.11).

Principles for Developing Management Direction

- Provide strategic rather than project-level guidance.
- Integrate management direction across program areas.
- Maximize flexibility at the project level.
- Do not repeat existing or higher-level direction (*e.g.*, laws, regulations, policy).
- Describe *what* is to be done, not *how* it is to be done based on the 6 forest plan decisions.

- Decision 2: Forest-wide standards and guidelines (36 CFR 219.13 to 219.27).
- Decision 3: Management area direction (36 CFR 219.11).
- Decision 4: Lands suited/not suited for timber production or other resource uses (36 CFR 219.14 and 219.16).
- Decision 5: Monitoring and evaluation requirements (36 CFR 219.11(d)).
- Decision 6: Wilderness recommendations to Congress (36 CFR 219.17).

Decisions (1) through (3) relate most directly to management *actions* on the ground. They focus on planned, permissible, and prohibited activities on National Forest land. Decisions (4) and (6) are broader land use designations, similar to zoning ordinances. Decision (5) sets forth monitoring and evaluation requirements that help determine if the forest plan is working and if it needs to be changed.

MANAGEMENT DIRECTION DEFINITIONS

This paper focuses on the management direction contained in Decisions (1) through (3) above. The 1982 planning rule states that every forest plan shall contain:

1. Forest multiple-use *goals* and *objectives* that include a description of *desired future condition* of the forest or grassland (36 CFR 219.11b), and
2. Multiple-use *prescriptions* and associated *standards and guidelines* for each management area including proposed and probable management practices (36 CFR 219.11c).

Types of Forest Plan Management Direction

- Goals
- Objectives
- Prescriptions
- Standards
- Guidelines

Five basic types of management direction – goals and desired future conditions, objectives, management prescriptions, standards and guidelines – are described in the planning regulations. Each has a unique role in defining the playing field and sideboards for forest management. In general:

- ❑ *Goals and desired future conditions* are broad statements of the **desired characteristics** of the forest resources that can be either forest-wide or specific to a Management Area.
- ❑ *Objectives* describe **time-specific courses of action** that move the resource toward the desired condition and can provide impetus for management programs.
- ❑ *Standards and guidelines* are **permissions or limitations pertaining to management practices** that modify the way they are implemented on the ground.
- ❑ *Prescriptions* are a set of **goals, objectives, standards and guidelines, and proposed/ probable management practices** that apply to a specific Management Area.

The regulatory definitions described below should be used when developing management direction.

Goals and Desired Conditions: According to the 1982 planning rule, a goal is “a concise statement that describes a desired condition to be achieved sometime in the future” (36 CFR 219.3). Goals address forest priorities and issues. They are broad and general in scope with no specific timeframe, and can be developed for the entire forest or for specific management areas (MA’s) as shown in the following examples:

- Goal (1): Promote ecosystem health and conservation using a collaborative approach to sustain the nation’s forests and watersheds
- Goal (2): Contribute to the conservation and recovery of federally listed threatened and endangered species and their habitats.

Goals/ Desired Conditions

Develop a narrative description, stated in a user-friendly manner, of what a specific area will be like when all the objectives, standards and guidelines for the

- Goal (3): Remove sources of weed seed and propagules to prevent new infestations and the spread of existing weeds.

Goals should also reflect the agency's national strategic plan, and it is helpful to make explicit connections between forest plan goals and national goals. The above examples reflect the Forest Service Strategic Plan goal to "provide ecological conditions to sustain viable populations of native and desired non-native species and to achieve objectives for Management Indicator Species (MIS)/focal species" (2000 USDA Forest Service Strategic Plan Revision, Goal 1b).

Desired Conditions: Goals and desired conditions are very similar. The 1982 rule states that goal statements should "include a description of a desired future condition of the forest or grassland." DC's can be written as separate statements or as part of the goal statement. In either case, they set the context for goals and other management direction by providing a broad, user-friendly snapshot of what the forest or management area will look like when goals, objectives, standards and guidelines have been met. Desired conditions can apply to the present and/or the future and do not consider costs. For example:

- DC (1): Vegetative conditions that have been degraded or diminished in quality or geographic extent by past management are restored to conditions representative of natural vegetation communities.
- DC (2) Aquatic and terrestrial wildlife habitats are diverse, healthy, productive and resilient.
- DC (3): Undesirable Non-Native Invasive Species (NNIS) populations are appreciably reduced or eliminated within the National Forest.

Objectives: According to the 1982 regulations, an objective is "a concise, time-specific statement of measurable planned results that responds to pre-established goals (36 CFR 219.3)." Objectives are specific steps to accomplish forest plan goals. They must have a specific timeframe for attainment, which is assumed to correspond to the 10-15 year life of the plan unless otherwise stated. Objectives must also be measurable because attainment tracking is a required element of [forest plan monitoring](#).

Objectives
Time-specific, measurable actions needed to achieve goals.

To be measurable without being overly-prescriptive, objectives should be written as either a directional trend or a general range. For example, an objective corresponding to goal (1) above could be written as follows:

- Directional Trend:** Increase the acres of pine communities over 2004 levels. (The life of the planning cycle is the implied timeframe).
- General Range:** Increase the acres of pine communities by 10% to 15% over 2004 levels. (The life of the planning cycle is the implied timeframe).

Similarly, the following objective corresponding to Goal (2) above could be written as follows:

- Directional Trend:** Within 10 years, increase suitable goshawk foraging habitat over 2004 levels.
- General Range:** Within 10 years, increase suitable goshawk foraging habitat by 10% to 30% over 2004 levels.

Stating the objective in terms of directional trends or general ranges retains the strategic character of the forest plan while still providing measurable, planned results. Where adequate baseline data exist for monitoring and making comparisons, the R9 planning team recommends using a general range when developing objectives.

Objectives are measurable, but they should not be stated as standards. They are budget-dependent and subject to forces beyond agency control. For example, a major wildfire could nullify a vegetation objective. Therefore, do not use language that could legally mandate the attainment of an objective. Avoid precise floors (“increase red pine *by a minimum of 20%*”) and explicit ceilings (“allow *no more than 10%* increase in targeted NNIS species”). The exact value is very precise and should be avoided in most cases. In this example, a 10% increase in NNIS is virtually impossible to measure and could arguably require counting every plant on the forest. Avoid language that could unintentionally transform an objective into an unattainable, legally-mandated standard.

Objectives do not prescribe the management practices or precise steps for their accomplishment. According to the regulations, “an objective forms the basis for further planning to define the precise steps to be taken and the resources to be used achieving identified goals (36 CFR 219.3)”. The general practices used to achieve objectives are outlined in “proposed and probable management practices” (36 CFR 219.11(c)), and the specific steps for attainment should be developed during implementation. The following examples, which correspond to the above objectives, may be more appropriate for project-level planning than forest planning:

1. Use even-age management to provide 500 to 750 acres of white pine regeneration within a particular area. (Unless you have good data, project-level analysis could show that other species are better-suited for that area).
2. Retain at least 20 conifer trees per acre (15” to 25” dbh) on each harvest unit as foraging habitat for goshawk. (This objective could easily prove unattainable).

In addition to being too site-specific, item (2) above is stated as a standard rather than an objective. This is not recommended because a standard is legal requirement rather than a desirable target (see *Standards* below). Since objectives are only desirable targets, do not assume their attainment in the forest plan NEPA document.

Finally, attainment of all objectives stated in the forest plan should be a reasonable expectation. To accomplish this, it is critical that the interdisciplinary team and the FLT evaluate proposed objectives across all resources to ensure they are reasonable and can be accomplished within stated timeframes and budgetary constraints.

Standards: Standards are mandatory permissions and limitations needed to achieve the goals and objectives of the plan. *They are applicable to all foreseeable management situations: deviation from them requires amendment to the forest plan.* Standards can be developed for forest-wide application or for specific management areas. They should be easily implemented and comply with all applicable laws, regulations, executive orders, and policies. The implementation of standards should not depend on future plans, analysis, or accomplishments that may never occur. In addition, the standard itself should not attempt to regulate factors beyond management control (*e.g.*, water temperature, pH), but it can regulate activities when certain conditions exist. Because standards must be monitored (36 CFR 219.12(k)), they should be written in such a way that compliance could be verified. For example:

1. Even-age harvest methods are not permitted in mature northern hardwood forest types.
2. Maintain a minimum 330-foot no-harvest zone around known northern goshawk nests.
3. No pesticides that are toxic to aquatic organisms shall be used for control of NNIS.

Guidelines: Guidelines are permissions and limitations that should be implemented in most situations. They can be forest-wide or Management Area specific. *Deviation from a guideline does not require forest plan amendment, but the rationale must be disclosed in the project decision documents.* If a

Standards
Develop permissions or limitations that must be implemented to achieve goals and objectives.

management practice does not entail sufficient risk to be addressed in the effects analysis, it is probably not necessary to develop guidelines for that practice. Because guidelines must be monitored (36 CFR 219.12(k)), they should be written in such a way that compliance could be verified. For example:

1. Where feasible, use uneven-age management to promote the re-establishment of northern hardwood forest types.
2. Where practicable, maintain a selective-cut buffer that extends up to 150 feet beyond the 330-foot no harvest zone around known northern goshawk nests.
3. Where feasible, avoid the use of chemical herbicides to control NNIS.

Guidelines

Develop permissions and limitations, that *should be implemented in most cases* to achieve goals and objectives.

Management Prescriptions: Management prescriptions consist of “management practices and intensity selected and scheduled for application on a specific area to attain multiple-use and other goals and objectives” (36 CFR 219.3). The “management practices” are defined as “specific activities, measures, courses of action, or treatments” (36 CFR 219.3).

Prescriptions

Develop a specific set of management activities for each Management

In practice, a management prescription usually provides a complete set of goals, objectives, standards and guidelines for a specific Management Area including a discussion of “*proposed and probable management practices*” that will occur over the planning cycle (36 CFR 219.11(c)). In some situations, however, management prescriptions can have a forest-wide scope. For example, some forests have grouped all of their watershed or riparian management direction into a “Prescription”. This is a convenient way to locate management direction in one place, but it does not necessarily imply that all watersheds or riparian resources on the forest are formal Management Areas. The approach and terminology used in the forest plan should be agreed to by the FLT and IDT.

RECOMMENDATIONS FOR DEVELOPING MANAGEMENT DIRECTION

Each element of management direction plays a unique role in the forest plan and should be used in accordance with the following recommendations:

RECOMMENDATION (1): Develop all management direction using the appropriate definitions.

The Forest Leadership Team (FLT) and the Interdisciplinary Team (IDT) should agree early on definitions of desired conditions, goals, objectives, standards and guidelines. The definitions provided in this paper are consistent with the 1982 planning rule and strongly recommended. Avoid the juxtaposition of different types of management direction. For example, goals and objectives are often presented as standards or guidelines to ensure implementation on every project. This can be confusing and even counterproductive because the regulations require compliance with *all* management direction. The way goals and objectives are written determines how universally they must be applied. For example, an objective of restoring 10 miles of fish habitat over 15 years would not require stream restoration with every project, just that 10 miles of restoration be accomplished somewhere on the forest within the timeframe. On the other hand, a forest-wide goal to “maintain or restore natural vegetation (composition, structure and function) in all riparian areas” pertains to the entire forest and arguably applies to every project where riparian areas are present. These types of prescriptive goals should not be presented as standards or guidelines, which typically limit management activities (a typical standard might be “no commercial harvest within 100 feet of Class I streams”). The IDT should carefully write management direction using the appropriate definitions to meet the management need.

Use the Appropriate Definitions consistently throughout the planning process.

It is also important to ensure the use of appropriate definitions consistently throughout the planning process. Personnel changes in the IDT and other factors can cause lapses in institutional memory. For this reason, the IDT and FLT should work to ensure that the agreed-upon definitions are used consistently throughout the planning process.

RECOMMENDATION (2): Develop management direction focused on key issues. Management direction should consist of concise statements that embody Forest Service priorities while addressing key issues identified in the AMS and NOI.

Develop management direction focused on key issues.

RECOMMENDATION (3): Tailor management direction to the need.

Every type of management direction does not have to be used in every situation. For example, objectives may be necessary only when a management *action* is needed to achieve a goal or desired condition (e.g., vegetative or habitat restoration). Similarly, goals that simply maintain or protect a particular condition can often be achieved exclusively through the use of standards and guidelines rather than by developing objectives and management prescriptions. Well written elements of management direction work together to provide clear, concise, easily implemented guidance to field personnel.

Use the type of Management Direction suited to the need.

RECOMMENDATION (4): Develop integrated management direction across all resource areas. It is critical that the management direction from each resource group be well-integrated *across* disciplines. Simply stated, management direction should be streamlined, non-redundant, and non-contradictory across resource areas. For example,

Integrate Management Direction across all Resource Areas.

direction from one resource group should not repeat or unnecessarily overlap with direction from another resource group. A well-written standard in one resource area can often meet similar objectives in other resource areas and eliminate the need for repetition. Similarly, standards from one resource area should not contradict or nullify standards from another resource area. The forest IDT should develop the appropriate combination of management direction for their forest, and the FLT should actively oversee the process to ensure that the direction is appropriate for the forest and integrated across resource areas.

RECOMMENDATION (5): Do not plan to plan. The forest plan includes six decisions that are designed to provide management direction for project level implementation. Processes such as mid-level analysis are part of program management, but **do not** fall within the scope of the six forest plan decisions. These types of analyses, once completed, can be used for programmatic direction and amending the forest plan, but should not be part of the forest plan management direction.

Do not Plan to Plan.

RECOMMENDATION (6): Develop management direction that can be cost-effectively evaluated. Forest plan compliance must be monitored. Develop goals, objectives, standards and guidelines for which attainment and/or compliance can be easily evaluated. Consider the following standard:

1. Design and construct all stream crossings and in-stream structures to promote ecosystem health. *Ecosystem health is vague and difficult to measure.*
2. Design and construct all stream crossings and other instream structures to pass a 25-year peak flow and to provide for the unhindered passage of aquatic organisms. *This standard is easier to measure. Attainment can be assessed based on hydraulic design specifications and fish passage requirements found in manual, handbook or procedural guides.*

Develop management direction that can be cost-effectively evaluated.

RECOMMENDATION (7): Develop standards and guidelines that are not budget-dependent. Compliance standards and guidelines is mandatory regardless of budget levels. Desired conditions, goals and objectives are more flexible because attainment can be accelerated or delayed based on available resources. State all budget-dependent direction as goals, desired conditions or objectives rather than standards and guidelines.

Develop standards and guidelines that are not budget-dependent.

RECOMMENDATION (8): Do not repeat/quote existing higher-level direction or lists. The policies and procedures embodied in the forest plan often change within a shorter time frame than the plan itself. To minimize the need for plan amendment, cite existing guidance when necessary, but *do not* repeat or quote existing direction that may change before the end of the planning cycle. For example, a forest plan might have to be amended if it quotes the Unified Federal Policy (UFP) and the wording of the UFP is subsequently modified.

A second reason to avoid repetition of existing direction is that the proposed forest plan is subject to public review and becomes legally binding when finalized. It is not appropriate or meaningful to subject existing laws, regulations, executive orders, policies, or other higher-level direction to public debate during the plan revision process. The following approach is suggested:

Do not repeat/quote higher-level direction or lists that may change.

1. Use general statements similar to the following: “The forest plan will follow all applicable laws, executive orders, manual/ handbook guidance, and other appropriate guidance.”
2. Do not repeat the Directive System in the forest plan (see RF letter dated 31-Jan-02).
3. Put the following types of information into manual supplements, handbooks, technical guides or compendiums.
 - a. specific policy guidance (e.g., the Unified Federal Policy (UFP).
 - b. procedural requirements (e.g., FSM, FSH)
 - c. design specifications (e.g., engineering guides/manuals).
 - d. analytical tools and processes (e.g., the Roads Analysis Process (RAP)).

Lists that are subject to change during the planning cycle should be incorporated by reference rather than transcribed directly into the plan. Examples include the Regional Forester’s Sensitive Species (RFSS) list, Threatened and Endangered Species (T&E) list, and the EPA 303d Water Quality Impaired list. If the list is transcribed into forest plan, any change in any of these lists could trigger the need for a plan amendment. Conversely, a change in a list that is only referenced by the plan would not necessarily trigger an amendment.

RECOMMENDATION (9): Develop standards and guidelines that will influence the effects analysis. Standards and guidelines are designed to achieve desired conditions, goals and objectives in the forest plan (see definitions). They are usually mitigation measures that minimize or negate the effects of a management action or land use. *The effects analysis is based on the premise that all standards will be implemented.* Therefore, standards should be designed such that the outcome of the effects analysis would be different if they were not implemented. Because guidelines are not mandatory in every situation, the effects analysis should not rely quite as heavily on guidelines to mitigate effects.

Develop standards that will influence the effects analysis.

RECOMMENDATION (10): When feasible, use one common set of standards and guidelines for all alternatives. Standards and guidelines are management requirements for achieving the goals and objectives of the forest plan. They are often based on technical or scientific information that has been interpreted and applied by resource professionals. Varying the standards and guidelines among alternatives can be confusing to the public. It can also weaken the plan by subjecting its scientific and technical underpinnings to public debate. It is more desirable to focus public attention on the desired condition, goals, and objectives of each alternative rather than on the technical means for accomplishing them. To the extent possible, determine the appropriate standards and guidelines for managing the resource and keep them consistent across alternatives. Clearly document the discussion and rationale in the effects analysis and/or project files.

When feasible, use one common set of standards and guidelines for all alternatives.