

CHAPTER II

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CHAPTER II: COMPARISON OF ALTERNATIVES

An EA must include a reasonably range of alternatives. Alternatives to the Proposed Action should meet the purpose and need identified in Chapter I and address at least one of the significant issues. A No Action Alternative must also be included in the range of alternatives to serve as a baseline for comparison.

After considering the comments received during scoping, an interdisciplinary team identified 21 alternatives. Four alternatives were considered in detail (No Action, Proposed Action, Alternative 1, and Alternative 2), and their effects are described in Chapter III. The other 17 alternatives were not considered in detail, the reasons for which are explained at the end of this chapter.

The specific standards and monitoring requirements that would continue to be implemented if the No Action Alternative were selected are listed in the 1986 *Forest Plan*, as amended. Those that would be implemented (via the Proposed Action, Alternative 1, or Alternative 2) are listed in Appendix A of this EA.

ALTERNATIVES CONSIDERED IN DETAIL

NO ACTION ALTERNATIVE

This alternative is the continued implementation of the existing *Forest Plan* into the foreseeable future. Under this alternative, the *Forest Plan* would not be amended at this time. Threatened and endangered species' management and on-going and future site-specific projects would continue to be governed by existing *Forest Plan* goals, Forest-wide standards, Management Prescription (MP) allocations, and Zoological Area standards until the *Forest Plan* is amended or revision is completed (Appendix B, No Action Alternative Maps). Appendix E of this EA ("Conservation Plan for Federally Listed Threatened and Endangered Species") documents the MNF's efforts to meet ESA responsibilities and manage, protect, and aid in the recovery of endangered and threatened species of the MNF.

This alternative is presented to satisfy the NEPA requirement for a No Action Alternative as a basis for comparison. The No Action Alternative would not meet the purpose and needs identified for Indiana bat and WV northern flying squirrels as described on page 2 of Chapter I. It would be illegal to implement because it would violate the ESA.

Indiana bat

Mandatory Terms and Conditions that were identified in the USFWS' March 2002 *Biological Opinion* would not be adopted; therefore, the *Forest Plan* would not meet Forest Service responsibilities for the Indiana bat consistent with the ESA of 1973, as amended. The optional Conservation Recommendations the USFWS recommended for the Indiana bat in their 2002 *Biological Opinion* would not be adopted.

WV northern flying squirrel

The *Guidelines for the identification and management of WV northern flying squirrels* that were made part of the *Appalachian Northern Flying Squirrel's Recovery Plan (Updated)* in September 2001 would not be incorporated; thus, the *Forest Plan* would not meet Forest Service responsibilities for WV northern flying squirrels consistent with the squirrel's approved recovery plan.

Virginia big-eared bats

Specific guidance for the management of VA big-eared bats and their habitat would not be incorporated as recommended in the VA big-eared bat's "Measures to Minimize Potential Adverse Effects" section on page 76 of the *Revised Biological Assessment*.

Cheat Mountain salamander

Specific guidance for the management of Cheat Mountain salamanders and their habitat would not be incorporated as recommended in the Cheat Mountain salamander's "Measures to Minimize Potential Adverse Effects" section on page 39 of the *Revised Biological Assessment*.

Various threatened, endangered, and proposed species

No revisions would be made to Forest-wide threatened, endangered, and proposed species' standards to clarify the MNF's management practices and enhance the MNF's programmatic commitment to the management, protection, and recovery of threatened, endangered, and proposed species.

PROPOSED ACTION

This alternative was outlined for the public in February 2001. It responds to the purpose and need to incorporate into the *Forest Plan* new information regarding federally listed threatened and endangered species, primarily for the Indiana bat and WV northern flying squirrel.

The Proposed Action (like the existing *Forest Plan*) would result in a programmatic decision that would provide a framework for implementing future activities across the MNF. It would not make a decision about a particular action at a defined location; further analysis would be conducted before a site-specific project could be approved and implemented.

Proposed changes to the *Forest Plan*'s organization and/or management of threatened, endangered, and proposed species are summarized within the boxes provided on the following pages. Information is presented first by species, followed by the sections of the *Forest Plan* that would be modified. Existing *Forest Plan* direction is shown in plain text; existing text to be removed from the *Forest Plan* is shown with a ~~strike through~~; text to be added is shown in **bold**.

Indiana bats

Standards described on the following pages would ensure the *Forest Plan* complies with the ESA by addressing Mandatory Terms and Conditions of the 2002 *Biological Opinion*. They would aid in the recovery of the Indiana bat in the following ways:

- I. Increase acres managed expressly for protection and recovery of Indiana bats.
- II. Regulate vegetation and timber management specifically to benefit Indiana bats.
- III. Create Forest-wide Indiana bat standards for (1) reporting and documenting Indiana bat information, (2) consulting with the USFWS; and (3) monitoring and developing protection plans.
- IV. Administer other MNF management activities to avoid adverse effects to Indiana bats.

I. Increase acres managed expressly for protection & recovery of Indiana bats.

Forest Plan standards would be revised, and some would be added to increase the acres managed primarily for the protection and recovery of Indiana bats. Under existing land allocations, ~30 acres are managed specifically for the protection and recovery of Indiana bats (*Forest Plan*, Zoological Areas for Threatened and Endangered Bats, pp. 230-234). Forest-wide threatened and endangered species standards on pages 84-87 of the *Forest Plan* provide direction for the protection, management, and recovery of Indiana bats throughout the Forest; but no MPs are specifically designated for managing, protecting, and aiding in the recovery of Indiana bats.

Proposed land allocations (e.g. creation of MP 6.3 areas and expansion of existing Zoological Area boundaries for the Indiana bat) would ensure ~158,000 acres of the MNF would be managed expressly for the protection and recovery of Indiana bats.

The following standards are proposed to ensure the *Forest Plan* complies with mandatory Term and Condition #1 of the USFWS' March 2002 *Biological Opinion*. They also would address the need to provide specific guidance for the protection and enhancement of Indiana bats and their habitat.

Revisions to Forest-wide Standards

See Appendix A, pp. 5 and 7

- ✓ **The area of influence for Indiana bats is recognized as three distinct areas—hibernacula, key areas, and primary range. 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. Therefore, Forest wide, MP 6.3, MP 8.0, and Zoological standards for OA 838 will be used to manage Indiana bat populations”** (Forest-wide standard, #9 (b)).
- ✓ ~~Identified nursery colonies, hibernation sites, and corridors~~ **Hibernacula, maternity colonies, 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 MP 6.3 direction and standards. Forage habitat will be managed under Forest-wide riparian area standards, 2670 C and the following standards will also be used to manage these areas** (Forest-wide standard, #13 (c)(1)).

Addition of MP 6.3 Standards

See Appendix A, pp. 13 and 14

- ✓ **This prescription will emphasize the following: Management of the habitat most likely to be used as summer roosting and foraging habitat by Indiana bats. This habitat is referred to as the primary range of the Indiana bat** (MP 6.3 description of the primary purpose).
- ✓ **This management prescription (MP) is assigned to lands that exist within a five-mile radii of known Indiana bat hibernacula but that are not identified as hibernacula or key areas. MP 6.3 lands are considered to be the primary range of Indiana bats and will be managed to provide the basic habitat components needed by the Indiana bat over time** (MP 6.3 area description).
- ✓ **Management Prescription 6.3 Areas will be defined around known Indiana bat hibernacula. Areas may vary in size, but will extend no more than 5 miles in radius from hibernacula** (MP 6.3 description of the desired future condition).

✓ Opportunity areas will be defined as:

- ~~1) An area at least 200 feet in radius from the entrance of inhabited caves.~~
- ~~2) An area at least 200 feet in radius around a maternity colony of Virginia big-eared bat as long as the site is used.~~
- ~~3) A forested travel corridor 330 feet wide between cave entrances and foraging areas.~~
 - 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 colony for the Indiana bat, unless consultation with the USFWS on a site-specific basis indicates otherwise (Zoological Area standard, 1950).**

II. Regulate vegetation & timber management specifically to benefit Indiana bats.

Numerous *Forest Plan* standards would be revised or added to regulate vegetation and timber management activities for the benefit of Indiana bats. Vegetation and timber management activities would be restricted the least on lands outside a five-mile radius of Indiana bat hibernacula. Activities would be restricted the most near Indiana bat hibernacula and maternity roosts (see proposed standards for Indiana bat Zoological Areas in Appendix A and Timber Sale Program effects in Chapter III).

Existing Forest-wide threatened and endangered species standards (pp. 84-87 of the *Forest Plan*) provide general direction for the protection, management, and recovery of Indiana bats throughout the Forest. No MPs are specifically designated for the management, protection, and recovery of Indiana bats. Only ~30 acres of Zoological Areas are officially designated for the management, protection, and recovery of Indiana bats.

Proposed Forest-wide Indiana bat standards would provide specific guidance for the retention of quality roost trees in all cutting units throughout the Forest.

A new **MP (MP 6.3)** would be created to recognize a large management area (~156,000 acres) specifically for the protection and recovery of Indiana bats. MP 6.3 vegetation, timber, and wildlife standards would be created to dictate which vegetative activities would be allowed or prohibited within five-mile radii of Indiana bat hibernacula. For example, more shagbark hickory, snags, and culls would be retained and maintained within the cutting units of MP 6.3 areas than would be retained in cutting units of some existing MPs (e.g. MP 3.0 areas). Limits would be placed on the percentage of an area that could be harvested and the area that could be disturbed in a given time frame -- limits that are consistent with existing MP 6.1 standards but not consistent with other MP standards (e.g. MP 2.0 and MP 3.0). Standards would be created to identify the size of trees (diameter at breast height)(dbh) that would be retained or could be harvested in cutting units -- controls that aren't currently required in any existing MP area. Emphasis would be placed on the retention of older trees, more so than is required in some existing MPs (such as MP 3.0 areas).

Zoological Area standards would be changed to (1) ensure mature or old growth habitat would be developed and maintained near Indiana bat hibernacula; (2) expand the area of protection around known maternity sites from a 200-foot radius to a 2-mile radius; and (3) provide more specific guidance as to the vegetation and timber management activities that may occur within such important Indiana bat habitat. Less vegetation, timber, or wildlife management would be implemented in the Indiana bat's Zoological Areas than in MP 6.3 areas.

The following standards would ensure the *Forest Plan* complies with Term and Condition #1 of the USFWS' March 2002 Biological Opinion. Specific standards also are proposed to ensure compliance with Term and Condition #2, 4, 6, and 8. These standards would address the need to provide specific guidance for the protection and enhancement of Indiana bats and their habitat.

Revisions to Forest-wide Standards

See Appendix A, pp. 7 and 8

- ✓ **Retain all shagbark hickory trees in cutting units except where public safety concerns exist.** (Forest-wide Indiana bat standard, #13 (c)(3) to address Term and Condition #2 of the USFWS' March 2002 Biological Opinion).
- ✓ **Monitor snag retention in cutting units. If an average of less than 6 snags/acre with 9" dbh exists, manually create additional snags.** (Forest-wide Indiana bat standard, #13 (c)(4) to address Term and Condition #4).
- ✓ **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).** (Forest-wide Indiana bat standard, #13 (c)(5) to address Term and Condition #6).
- ✓ **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.** (Forest-wide Indiana bat standard, #13 (c)(7) to address Term and Condition #8).

Addition of MP 6.3 Standards

See Appendix A, pp. 13-21

- ✓ **Lands within MP 6.3 were previously allocated to MP 2.0 (managed for shade tolerant tree species using un-evenaged silviculture), MP 3.0 (managed for shade intolerant hardwood tree species using even-aged silviculture), MP 4.0 (managed primarily for conifer species), MP 6.1 (remote habitat for wildlife and a mix of forest products), and MP 7.0 (high density, recreation environment). These lands may continue to be subject to MP 2.0, 3.0, 4.0, 6.1, and 7.0 standards; however, MP 6.3 standards will override other standards (MP 6.3 Area Description).**
- ✓ **Emphasis will focus on management of the naturally occurring tree species composition to provide a continuous supply of suitable roost trees and preferred foraging habitat for Indiana bat. Normal forest management activities will be used to achieve vegetative diversity that will enhance the habitat of the Indiana bat. Management activities may contribute to a sustained yield of timber products (MP 6.3 desired future condition description).**
- ✓ **Management of vegetation that is less than 5" dbh may occur any time of the year (MP 6.3, 1900 vegetation standard, #1).**
- ✓ **Management of vegetation that is 5" dbh or greater may be implemented within the primary range of Indiana bats only to improve or enhance Indiana bat 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 (MP 6.3, 1900 vegetation standard, #2).**

- ✓ **To reduce the chance of “taking” a roosting Indiana bat, tree felling for large-scale activities (e.g. most timber sales, construction of collector and arterial roads, etc.) is prohibited within the primary range between April 1 and November 15. However, tree felling for small-scale activities (e.g. development of individual gas well pads, construction of local roads, road maintenance, etc.) may be allowed anytime of the year since such smaller disturbances are less likely to “take” a bat (MP 6.3, 1900 vegetation standard, #3).**
- ✓ **Snags and cull trees will be managed to keep them available in this prescription throughout the entire rotation (MP 6.3, 1900 vegetation standard, #4).**
- ✓ **Retain all known Indiana bat roost trees (MP 6.3, 1900 vegetation standard, #4 (a)).**
- ✓ **Retain all shagbark hickory trees, unless they create a safety hazard (MP 6.3, 1900 vegetation standard, #4 (b)).**
- ✓ **Retain all snags unless they create a safety hazard. If an average of less than 6 snags/acre with 9” dbh 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 (MP 6.3, 1900 standard, #4 (c)).**
- ✓ **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 (MP 6.3, 1900 standard, #4 (d)).**
- ✓ **Limit use of pesticides in these areas (MP 6.3, 2150 Pesticide Use, Management, and Coordination).**
- ✓ **Timber management practices may be implemented on National Forest lands within the primary range of Indiana bats only to improve or enhance Indiana bat habitat, to maintain or enhance natural vegetative communities on appropriate sites (see Forest-wide standards and guidelines 1900 – Vegetation), or for public safety (MP 6.3, 2400 Timber Management standard).**
- ✓ **To meet Indiana bat and other wildlife needs, seek to establish a balanced age class distribution. Normal rotation ages would be:**

<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 (MP 6.3, 2410 Timber Regulation).

- ✓ **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 (MP 6.3, 2410 Timber Regulation standard).**
- ✓ **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 (MP 6.3, 2460 Other than Commercial Sales standard).**
- ✓ **The even-aged silvicultural system generally will be used to create age class diversity and balance age classes over the long term. However, the un-evenaged silvicultural system may be used if deemed appropriate after a site-specific analysis (MP 6.3, 2470 Silvicultural Systems standard, #1).**
- ✓ **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 (MP 6.3, 2470 Silvicultural Systems standard, #2).**
- ✓ **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 (MP 6.3, 2470 Silvicultural Systems standard, #3).**

- ✓ **When designing regeneration harvest areas under the even-aged system, the following will be used to insure appropriate “leave trees” are retained for Indiana bat habitat (MP 6.3, 2470 Silvicultural Systems standard, #4):**
 - (a) Follow 1900 standards for snag and cull management.**
 - (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.**
 - (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.**
 - (1) Leave clumps should be retained at a rate of one-third an acre per five to eight acres of regeneration harvest area.**
 - (2) These clumps should be attached to the woodland edge by a corridor of trees, if possible.**
 - (3) Snag or cull clumps left along stream shade strips or seeps are preferred over isolated clumps or clumps along other edges.**
 - (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 (MP 6.3, 2470 Silvicultural Systems standard, #4).**
- ✓ **If individual and group selection harvests are implemented, insure that a component of large, over-mature trees, if available, remain in the immediate vicinity to provide suitable roosting habitat (MP 6.3, 2470 Silvicultural Systems standard, #5).**
- ✓ **Until a balanced age class distribution is achieved, regeneration harvests may occur anytime after age 70 and will emphasize stands originating after 1905 (MP 6.3, 2470 Silvicultural Systems standard, #6).**
- ✓ **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 (MP 6.3, 2470 Silvicultural Systems standard, #7).**
- ✓ **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 (MP 6.3, 2600 Wildlife Management standard, #1).**
- ✓ **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 (MP 6.3, 2600 Wildlife Management standard, #2).**
- ✓ **Maintain no more than 7.5 percent of the primary range in the 0-14 age class (woodland habitat) at any time (MP 6.3, 2600 Wildlife Management standard, #3).**
- ✓ **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 (MP 6.3, 2600 Wildlife Management standard, #5).**

Revisions to Zoological Area Standards

See Appendix A, pp. 30-32, and 34

- ✓ **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 (Zoological Area 1950 NEPA standard, #3).**
- ✓ **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 (Zoological Area 1900 Vegetation standard, #1).**

- ✓ **Management of vegetation 5” dbh or greater may be implemented within the key areas of Indiana bats or within two miles of their maternity colonies, but only to improve or enhance Indiana bat 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 (Zoological Area 1900 Vegetation standard, #2).**
- ✓ **Management of vegetation 5” dbh or greater may be implemented within the primary range of Indiana bats, but only to improve or enhance Indiana bat 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 OA 838 standards for 2400 (Timber Management) and 2670 (Threatened and Endangered Species that are related to vegetation management (Zoological Area 1900 Vegetation standard, #3).**
- ✓ **To reduce the chance of “taking” a roosting Indiana bat, tree felling for large-scale activities (e.g. most timber sales, construction of collector and arterial roads, etc.) is prohibited within key area and within two miles of maternity colonies between April 1 and November 15 (Zoological Area 1900 Vegetation standard, #4).**
- ✓ ~~Avoid~~ **Limit** use of pesticides in the ~~management areas~~ **opportunity area** (Zoological Area 2150 Pesticide Use, Management, and Coordination standard).
- ✓ ~~Vegetative treatments may be undertaken if coordinated with bat habitat requirements in the opportunity area. In travel corridors, the objective is to maintain or create an unbroken Forest canopy (Zoological Area, 2400 Timber standard).~~
- ✓ **Commercial timber harvests may occur within key areas and within two miles of maternity colonies only if used as a tool to enhance Indiana bat habitat (Zoological Area 2400 Timber standard).**
- ✓ Prohibit any construction or permanent type of activities **at cave entrances** unless created for the protection of ~~threatened or endangered~~ **Indiana** bats (Zoological Area, 2670 Threatened, Endangered, and Proposed Species Management standard, #2(h)).
- ✓ **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 ridgetops/side slopes around the cave (Zoological Area, 2670 Threatened, Endangered, and Proposed Species Management standard, #3(a)).**
- ✓ **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 (Zoological Area, 2670 Threatened, Endangered, and Proposed Species Management standard, #3(b)).**

III. Create Indiana bat standards for (1) reporting and documenting Indiana bat information; (2) consulting with the USFWS; and (3) monitoring and developing protection plans.

Existing standards do not spell out how management activities should be reported to the USFWS, or how Indiana bat use of the MNF should be monitored and documented. New standards are proposed to provide specific guidance for (1) reporting vegetation management activities to the USFWS; (2) monitoring and buffering possible maternity colonies of Indiana bats; (3) developing appropriate protection plans for newly discovered Indiana bat hibernacula; (4) determining when formal versus informal consultation with the USFWS is needed; and (5) ensuring the exemption of incidental take of Indiana bats is appropriately documented.

The following standards are proposed to ensure the *Forest Plan* complies with Terms and Conditions #2,7, 9, 10, and 11 of the USFWS' March 2002 *Biological Opinion*. They also would address the need to provide specific guidance for the protection and enhancement of Indiana bats and their habitat.

Revisions to **Forest-wide** Standards

See Appendix A, pp. 7-10

- ✓ **Each year, report quarterly to the USFWS the cumulative amount of acres involved in tree removal and prescribed burning** (Forest-wide Indiana bat standard #13 (c)(2) to address Term and Condition #2).
- ✓ **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** (Forest-wide Indiana bat standard #13 (c)(6) to address Term and Condition #7).
- ✓ **If any new Indiana bat hibernacula are discovered, the MNF shall develop an appropriate protection plan, which could include signs, fences, or gates** (Forest-wide Indiana bat standard #13 (c)(8) to address Term and Condition #9).
- ✓ **In addition to those projects allowed under the programmatic incidental take statement, specific projects may proceed without formal consultations if implemented during the hibernation period. These projects do not count against the annual allowable acres permitted under the programmatic incidental take statement** (Forest-wide Indiana bat standard #13 (c)(9) to address Term and Condition #10).
- ✓ **In addition to those projects allowed under the programmatic incidental take statement, specific projects may also proceed during the non-hibernation period without formal consultation if:**
 - (a) **They occur outside of the area surrounding known roost trees or capture sites, hibernacula, maternity colonies, key areas and primary ranges of the Indiana bat, and**
 - (b) **They are surveyed for Indiana bats according to protocols established by the USFWS, and**
 - (c) **No Indiana bats are detected.**
 - (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 mist netting under this standard must be completed within three years of the netting.**
 - (d) **These projects do not count against the annual allowable acres permitted under the programmatic incidental take statement** (Forest-wide Indiana bat standard #13 (c)(10) to address Term and Condition #10).
- ✓ **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*, 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** (Forest-wide Indiana bat standard #13 (c)(11) to address Term and Condition #11).

Revisions to **Monitoring** and **Evaluation** Standards

See Appendix A, p. 43

- ✓ **Continue to seek Indiana bat maternity sites and evidence of summer use on the MNF on a watershed basis using survey methods and frequencies that follow guidelines and protocols established by the USFWS, in consultation with the USFWS and the WVDNR (Monitoring and Evaluation).**

IV. Administer other MNF management activities to avoid adverse effects to Indiana bats.

It is the MNF's existing practice to ensure various natural resources are managed to avoid adverse effects to Indiana bats, but few standards specifically address the restrictions.

Proposed MP 6.3 direction and standards would incorporate standards to articulate the MNF's practice of avoiding adverse effects to Indiana bats during the implementation of prescribed fires and the management of recreation, wilderness, range, visual quality, special use, mineral, and transportation resources within five-mile radii of Indiana bat hibernacula. **Zoological Area** standards would be modified or added to accomplish this same goal near Indiana bat hibernacula and within two-mile radii of maternity colonies.

The following proposed standards would ensure the *Forest Plan* is compliant with Term and Condition #1 of the USFWS' March 2002 *Biological Opinion*. They also would address the need to provide specific guidance for the protection and enhancement of Indiana bats and their habitat.

Revisions to **Forest-wide** Standards

See Appendix A, p. 10

- ✓ **Burn plans for prescribed fires will be developed to ensure adverse effects to Indiana bats are avoided (Forest-wide Indiana bat standard #13 (c)(14)).**

Addition of **MP 6.3** Standards

See Appendix A, pp. 13-15, 17, and 21-22

- ✓ **A semi-primitive and nonmotorized type of recreational environment. When roads are open to motorized use, semi-primitive motorized experiences will be provided (MP 6.3 description of secondary purpose).**
- ✓ **The primary range of Indiana bats that occur within MP 5.0 (wilderness protection), MP 6.2 (no timber management and semi-primitive, non-motorized recreation areas), and MP 8.0 (preservation of special areas) are not reassigned to MP 6.3 because MP 5.0, 6.2, and 8.0 management do not generally conflict with Indiana bat management. However, MP 6.3 standards may be applied to Indiana bat primary ranges within MP 5.0, 6.2, and 8.0 areas to the extent that MP 6.3 standards are consistent with the Wilderness Act and the standards of MP 5.0, 6.2, and 8.0 (MP 6.3 Area Description).**
- ✓ **A system of roads and trails will provide access within the area for administrative and management purposes, including the transportation of forest products. Nonmotorized recreation opportunities will be provided by controlling public motorized vehicle use. Where roads are temporarily opened, semi-primitive motorized experiences will be provided (MP 6.3 Desired Future Condition)**
- ✓ **The permanent road system will be constructed to the lowest standard possible. The construction standards will protect the soil and water resource. Permanent road density will be influenced by terrain and the needs of the wildlife species in the Management Area. Most roads will be seeded to preferred wildlife food when not open for vehicle traffic (MP 6.3 Desired Future Condition).**

- ✓ **Facilities such as utility corridors or other special uses will be permitted, provided they are compatible with Indiana bat habitat management (MP 6.3 Desired Future Condition).**
- ✓ **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 (MP 6.3, 2200 Range Management standard).**
- ✓ **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 (MP 6.3, 2300 Recreation Management standard).**
- ✓ **The Indiana bat primary range will be managed to meet the same visual quality objectives identified for MP 6.1 areas (MP 6.3, 2380 Visual Management standard).**
- ✓ **Provide adequate water sources by creating or maintaining between 1 and 4 water sources per square mile within the primary range (MP 6.3, 2600 Wildlife Management standard #4).**
- ✓ **Special use permits may be issued within the primary range if they are compatible with Indiana bat management (MP 6.3, 2700 Special Use Management standard).**
- ✓ **Gas development within the primary range may be allowed when compatible with management objectives for Indiana bat (MP 6.3, 2800 Minerals and Geology standard #1).**
- ✓ **When minerals are privately owned, consultation with the USFWS will be undertaken to minimize adverse effects on habitat (MP 6.3, 2800 Minerals and Geology standard #2).**
- ✓ **Give high priority to controlling forest fires to prevent bat asphyxiation or significant changes to the vegetative cover (MP 6.3, 5100 Fire Management Standard #1).**
- ✓ **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 (MP 6.3, 5100 Fire Management Standard #2).**
- ✓ **Dynamiting may be permitted within the primary range if compatible with Indiana bat management (MP 6.3, 6760 Safety standard).**
- ✓ **Roads and trails leading to hibernacula may be blocked or obliterated to further discourage access (MP 6.3, 7700 Transportation system standard).**

Revisions to **Zoological Area** Standards Appendix A, pp. 30, 32-36 and 38

- ✓ **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 that are around cave entrances and mature stands near Indiana bat hibernacula, but only to the extent that they are consistent with the Wilderness Act or the standards for these three Management Areas (Zoological Area, 1950 NEPA standard #4).**
- ✓ **No new facilities will be constructed for public recreation use at hibernacula or within key areas (see 2670) (Zoological Area, 2300 Recreation standard).**
- ✓ **Provide adequate water sources by creating or maintaining between 1 and 4 water sources per square mile (Zoological Area, Threatened, Endangered, and Proposed Species Management standard #1).**
- ✓ ~~Prohibit special uses in the travel corridor that would be adverse to bat use (Zoological Area, 2700 Special Uses standard).~~
- ✓ **Special use permits will not be issued within Indiana bat hibernacula (Zoological Area, 2700 Special Uses standard #1).**
- ✓ **Special use permits may be issued within key areas and within two miles of maternity colonies only if they are compatible with Indiana bat management (Zoological Area, 2700 Special Uses standard #2).**

- ✓ Surface occupancy will not be permitted for mineral operations on ~~U.S.~~ **Federal minerals at cave entrances, within key areas, or within two miles of maternity colonies** (Zoological Area, 2800 Minerals and Geology standard #1).
- ✓ When minerals are privately owned, consultation with the ~~USDI~~ **USFWS** will be undertaken to minimize adverse effects on habitat (Zoological Area, 2800 Minerals and Geology standard #3).
- ✓ **Shot detonation and ground vibration generally will not be initiated within hibernacula, within key areas, or within two miles of maternity colonies** (Zoological Area, 2800 Minerals and Geology standard #4).
- ✓ ~~Give high priority to controlling forest fires to prevent bat asphyxiation or significant changes to the vegetative cover~~ (Zoological Area, 2670 Threatened and Endangered Species, #2(g) which would be deleted and moved to 5100 Fire standard).
- ✓ **Give high priority to controlling forest fires to prevent bat asphyxiation or significant changes to the vegetative cover** (Zoological Area, 5100 Fire Management standard #1).
- ✓ **Burn plans for prescribed fires will include a smoke management plan that minimizes the duration of smoke in the area, and maximizes smoke dispersion from the area** (Zoological Area, 5100 Fire Management, #2).
- ✓ Establish as high priority acquisition any caves inside the Monongahela Proclamation Boundary or Purchase Units, except commercially operated caves, that ~~is~~ **are** used by ~~either of these two endangered Indiana~~ bats (Zoological Area, 5400 Landownership standard).
- ✓ **Dynamiting generally will not be conducted within key areas or within two miles of a maternity colony** (Zoological Area, 6760 Safety standard, #2).
- ✓ Transportation ~~or utility~~ routes should avoid **hibernacula, key areas, and maternity sites**. ~~the opportunity area, if possible. Prohibit placement of new utilities or roads across opportunity areas without assessment~~ (Zoological Area, 7710 Transportation Planning standard #1).
- ✓ **Roads and trails leading to hibernacula may be blocked or obliterated to further discourage access** (Zoological Area, 7710 Transportation Planning standard #2).

Revisions to Appendices

See Appendix A, p. 44

- ✓ Within 1320 feet of caves used by the ~~INDIANA OR VIRGINIA BIG EARED BATS~~, construction and gas drilling and development will not be allowed when the caves are occupied by these bats. **See Zoological Area 2800 Minerals and Geology standards for guidelines applicable to Indiana bats** (Appendix K, page 17, #6).
- ✓ Consultation with the US Fish and Wildlife Service is mandatory prior to allowing gas development ~~near designated MA-8 bat caves~~ **within the opportunity areas established for Virginia big-eared bat and Indiana bat** (Appendix K).

WV northern flying squirrels

The following proposed changes to WV northern flying squirrels standards would meet the purpose and needs identified in Chapter I by helping ensure the *Forest Plan* complies with the ESA and is consistent with the *Appalachian Northern Flying Squirrels' Recovery Plan (Updated)*. WV northern flying squirrels would benefit from:

- I. Changing acres managed expressly for protection and recovery of WV northern flying squirrels;
- II. Regulating vegetation and timber management specifically to benefit WV northern flying squirrels;
- III. Administering other MNF management activities to avoid adverse effects to this species.

I. Changing the acres managed expressly for protection and recovery of WV northern flying squirrels.

Standards would be revised and added to the *Forest Plan* that would immediately change (from about ~59,000 acres to ~110,000 acres) the acres managed specifically for the protection and recovery of WV northern flying squirrels. Appendix X of the existing *Forest Plan* would be deleted entirely.

Existing standards ensure that as WV northern flying squirrels are positively identified in an area (as through capture), a ½-mile area around the capture site is recognized as “occupied” habitat; such habitat is labeled OA 832; and Zoological Area standards are implemented to protect and aid in the recovery of WV northern flying squirrels. Currently, Zoological Area OA 832 boundaries are based solely on the proximity to a capture site for WV northern flying squirrels, thus ½-mile radii may incorporate and protect habitat that is both suitable and unsuitable (i.e. areas that would not support WV northern flying squirrels because few or none of the habitat elements required by the species were present). Over time, more WV northern flying squirrels are likely to be captured and additional habitat designated for its protection. If all potentially suitable habitat as defined in Appendix X or in the 1990 *Appalachian Northern Flying Squirrels’ Recovery Plan* are proven occupied through continued and intensive survey efforts, substantially more acres (>100,000 acres) could be assigned to Zoological Area OA 832 -- even though a significant portion of these acres would be considered unsuitable habitat for the squirrel.

Proposed standards would alter the distribution and number of acres managed for WV northern flying squirrel (see Table A of this chapter and Proposed Action Maps in Appendix B). Under the direction of the squirrels’ amended recovery plan, about 150,000 acres of MNF lands would immediately be considered suitable habitat and all of it would be protected for WV northern flying squirrels.

The following standards would ensure the *Forest Plan* is consistent with the *Appalachian Northern Flying Squirrels’ Recovery Plan (Update)* of September 2001. They also would address the need to provide specific guidance for the protection and enhancement of this species and its habitat.

Revisions to Forest-wide Standards

See Appendix A, pp. 5 and 11

- ✓ **The area of influence for WV 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 (Forest-wide standard #9(c)).**
- ✓ ~~See Appendix X for interim standards (Forest-wide standard #13(g)).~~
- ✓ **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) (Forest-wide standard #13(g)).**

Revisions to Zoological Area Standards

Appendix A, pp. 39-40

- ✓ **Opportunity areas will be defined as within ½ mile of the confirmed location of the species. National Forest System (NFS) lands that provide suitable habitat characteristics consistent with the Guidelines for Habitat Identification and Management found in the Appalachian Northern Flying Squirrels Recovery Plan (Updated), unless consultation with the USFWS on a site-specific basis indicates otherwise (Zoological Area, 1950 NEPA standard #1).**

- ✓ **A map of suitable habitat will be produced, reviewed periodically, and refined collaboratively with USFWS and WVDNR as needed (Zoological Area, 1950 NEPA standard #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 (Zoological Area, 1950 NEPA standard #3).**

II. Regulating vegetation and timber management specifically to benefit WV northern flying squirrels.

Zoological Area standards would be revised or created to regulate vegetation and timber specifically for the protection or benefit of WV northern flying squirrels.

Existing Zoological Area standards do not specifically state that vegetation and timber management cannot be implemented within WV northern flying squirrel habitat, although this has been a common consequence. Proposed standards would specify when vegetation and timber management might be implemented within WV northern flying squirrel habitat. As under the No Action Alternative, vegetation management within WV northern flying squirrel habitat would be implemented on a limited basis. Proposed standards would restrict what and when such activities could occur, and timber outputs would be incidental (see Timber Sale Program effects in Chapter III).

The following proposed changes would ensure the *Forest Plan* remains consistent with the *Appalachian Northern Flying Squirrels' Recovery Plan (Update)* of September 2001. They also would address the need to provide specific guidance for the protection and enhancement of this species and its habitat.

Revisions to Zoological Area Standards

Appendix A, pp. 39 and 41

- ✓ **Vegetation management will be conducted only (1) to improve or enhance West Virginia northern flying squirrel habitat or (2) for public safety (Zoological Area, 1900 Vegetation standard #1).**
- ✓ **If a research permit under the Endangered Species Act section 10 is obtained, vegetation management activities may be allowed in suitable habitat to enhance the recovery of the subspecies and/or determine the affects of an activity on WV northern flying squirrel (Zoological Area, 1900 Vegetation standard #1(a)).**
- ✓ **Vegetation management for the preservation or enhancement of other threatened and endangered species may be implemented on a limited, case-by-case basis, after consultation with the USFWS (Zoological Area, 1900 Vegetation standard #1(b)).**
- ✓ **Commercial timber outputs will be incidental and subject to guidance under 1900 (Zoological Area, 2400 Timber standard).**

III. Administering other MNF management activities to avoid adverse effects to WV northern flying squirrels.

Existing standards provide little guidance for management of natural resources within WV northern flying squirrel habitat. Standards are proposed to articulate the Forest's existing practice of minimizing or preventing adverse effects to this species during the management of vegetation, minerals, recreation, etc. within suitable squirrel habitat. Proposed changes would ensure the *Forest Plan* remains consistent with the squirrel's updated recovery plan. They also would address the need to provide specific guidance for the protection and enhancement of this species and its habitat.

Revisions to Zoological Area Standards

Appendix A, pp. 39- 41

- ✓ Project activities in these areas will require consultation with ~~USDI, Fish and Wildlife Service~~ **USFWS**. WVDNR will be kept informed of activities (Zoological Area, 1560 Agencies standard).
- ✓ **Standards for Management Areas 2.0, 3.0, 4.0, 6.1, and 7.0 (areas from which OA 832 is derived) will continue to apply unless inconsistent with OA 832 standards for West Virginia northern flying squirrel** (Zoological Area, 1950 NEPA standard #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 West Virginia northern flying squirrel to the extent that they are consistent with the Wilderness Act or the standards for these three Management Areas** (Zoological Area, 1950 NEPA standard #5).
- ✓ ~~See also the interim standards and guidelines in the Plan Appendix.~~ (Zoological Area 2000 standard).
- ✓ **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** (Zoological Area, 2300 Recreation standard).
- ✓ **Special use permits may be issued if they are compatible with West Virginia northern flying squirrel management** (Zoological Area, 2700 Special Uses standard).
- ✓ **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** (Zoological Area, 2800 Minerals).
- ✓ **Road construction will not normally occur in suitable West Virginia northern flying squirrel habitat. Limited exceptions to this may be made for research related projects or other projects (e.g. related to gas well development, access to private lands, etc.) approved after consultation with the USFWS** (Zoological Area, 7700 Transportation standard).

Revisions to Monitoring and Evaluation Standards

Appendix A, p. 42

- ✓ Determine whether population trends of **WV northern flying squirrels** indicate that viable populations of all wildlife species are being maintained (Appendix A, Table 6, p. 42).

Revisions to Appendices

Appendix A, p. 44

- ✓ Threatened or Endangered, and sensitive flora and fauna and their habitat will be protected. See Plan forest-wide standards and guidelines 2670, special area Zoological Area standards and guidelines ~~namely Essential Habitat for T&E bats and Occupied Habitat for West Virginia Northern Flying Squirrel (VNFS), Plan Appendices X (VNFS) and Appendix U (Sensitive Plant and Animal Species);~~ and any recovery plans for T&E species (Appendix K, page 15 (16)).
- ✓ Appendix X would be deleted in its entirety.

Virginia big-eared bats

The following proposed changes would meet the purpose and needs identified in Chapter I by conveying additional guidance for the management of VA big-eared bats and their habitat (as described in the VA big-eared bat's "Measures to Minimize Potential Adverse Effects" section on page 76 of the *Revised Biological Assessment*). Proposed standards would also address the need to provide specific guidance for the protection and enhancement of this species and its habitat.

I. Clarifying management for the protection and recovery of VA big-eared bats.

Standards would be revised and some standards would be added to the *Forest Plan* to clarify the MNF's direction for management, protection, and recovery of VA big-eared bats. Existing standards ensure that ~40 acres are managed explicitly for the protection and recovery of threatened and endangered bats such as the VA big-eared bat (*Forest Plan*, pp. 230-234). Proposed standards would clarify MNF management for VA big-eared bats within the ~40 acres.

Revisions to Forest-wide Standards

See Appendix A, pp. 4 and 6

- ✓ **The area of influence for Virginia big-eared bat will be assigned to MP 8.0, Opportunity Area 837. Forest wide, MP 8.0, and Zoological standards for OA 837 will be used to manage Virginia big-eared populations** (Forest-wide standard #9(a)).
- ✓ Identified nursery colonies, hibernation sites, and corridors will be managed under **MP 8.0 and Zoological Area standards for Opportunity Area 837**. Forage habitat will be managed under Forest-wide riparian area standards, 2670 C (Forest-wide standard #10(b)(1)).
- ✓ **Before taking any actions on buildings that are within 6 miles of Virginia big-eared bat hibernacula or maternity sites, evaluate their potential to serve as roosting habitat and apply management protections as necessary** (Forest-wide standard #10(b)(2)).
- ✓ 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** (Forest-wide standard #10(b)(3)).
- ✓ **Burn plans for prescribed fires will be developed to ensure adverse effects to Virginia big-eared bats are avoided** (Forest-wide standard #10(b)(4)).

Revisions to Zoological Area Standards

Appendix A, pp. 23-24 and 26-28

- ✓ Project activities in these areas will require consultation with ~~USDI~~, **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 (Zoological Area, 1560 Agencies standard).
- ✓ **Vegetation management will be conducted within 200 feet of hibernacula 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), or (2) for public safety** (Zoological Area, 1900 Vegetation standard).
- ✓ Opportunity areas will be defined as
 - (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.

3) ~~A forested travel corridor 330 feet wide between cave entrances and foraging areas (Zoological Area, 1950 NEPA standard)-~~

- ✓ **Avoid Limit** use of pesticides in these management areas (Zoological Area, 2150 Pesticide Use, Management, and Coordination standard).
- ✓ Vegetative treatments may be undertaken if coordinated with bat habitat requirements in the opportunity area. ~~In travel corridors, the objective is to maintain or create an unbroken Forest canopy-~~ (Zoological Area, 2400 Timber standard).
- ✓ ~~Give high priority to controlling forest fires to prevent bat asphyxiation or significant changes to the vegetative cover-~~ (Zoological Area, 2670 Threatened, Endangered, and Proposed Species Management standard #8)(note: this existing standard is proposed for insertion into the fire section 5100).
- ✓ Prohibit any construction or permanent type of activities **within the opportunity area** unless created for the protection of ~~threatened or endangered~~ **Virginia big-eared bats** (Zoological Area, 2670 Threatened, Endangered, and Proposed Species Management standard #9).
- ✓ Prohibit special uses in the ~~travel corridor~~ **opportunity area** that would be adverse to bat use (Zoological Area, 2700 Special Uses standard #1).
- ✓ **Special use permits will not be issued for caves that harbor Virginia big-eared bats** (Zoological Area, 2700 Special Uses standard #2).
- ✓ Surface occupancy will not be permitted for mineral operations on ~~U.S. Federal~~ **U.S. 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** (Zoological Area, 2800 Minerals and Geology standard #1).
- ✓ **Shot detonation and ground vibration generally will not be allowed within the opportunity area** (Zoological Area, 2800 Minerals and Geology standard #2).
- ✓ **Give high priority to controlling forest fires to prevent bat asphyxiation or significant changes to the vegetative cover** (Zoological Area, 5100 Fire Management standard) (Note: this standard is the same as the standard that currently exists in the wildlife section 2670).
- ✓ Establish as high priority acquisition any caves inside the Monongahela Proclamation Boundary or Purchase Units, except commercially operated caves, that ~~is~~ **are** used by ~~either of these two endangered~~ **Virginia big-eared bats** (Zoological Area, 5400 Landownership standard).
- ✓ **Dynamiting generally will not be conducted within the opportunity area of a Virginia big-eared cave** (Zoological Area, 6760 Safety standard).
- ✓ Transportation ~~or utility routes~~ should avoid the opportunity area, ~~if possible. Prohibit placement of new utilities or roads across opportunity areas without assessment~~ (Zoological Area, 7710 Transportation Planning standard).

Revisions to Appendices

Appendix A, p. 44

- ✓ Within 1320 feet of caves used by the ~~INDIANA OR VIRGINIA BIG EARED BATS~~, construction and gas drilling and development will not be allowed when the caves are occupied by these bats. **See Zoological Area 2800 Minerals and Geology standards for guidelines applicable to Indiana bats** (Appendix K, page 17: (6)).
- ✓ Consultation with the US Fish and Wildlife Service is mandatory prior to allowing gas development ~~near designated MA 8 bat caves~~ **within the opportunity areas established for VA big-eared bat and Indiana bat.**

Cheat Mountain salamander

Proposed changes would meet the purpose and needs identified in Chapter I by conveying more specific guidance for the management of Cheat Mountain salamanders and their habitat, as described in the Cheat Mountain salamander's "Measures to Minimize Potential Adverse Effects" section on page 39 of the *Revised Biological Assessment*. Proposed standards would also address the need to provide specific guidance for the protection and enhancement of this species and its habitat.

I. Clarifying management for the protection and recovery of Cheat Mountain salamanders.

An existing *Forest Plan* standard would be edited so it (1) reflects current Cheat Mountain salamander survey information and (2) does not encourage the relocation of known populations (since relocation has not been proven effective for the management and protection of this species). Also, a proposed standard would explicitly require a 300-foot buffer be established around known Cheat Mountain salamander populations.

Revisions to **Forest-wide** Standards

See Appendix A, pp. 10-11

- ✓ 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 hardwoods some distance from spruce. It usually occurs above ~~3,400~~ 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. ~~where possible. Identified colonies may be relocated, but only if techniques currently under study are proven effective. Salamander sites will not be shown on maps.~~ (Forest-wide, #13(e)(1)).
- ✓ **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** (Forest-wide, #13(e)(2)).

Various threatened, endangered, and proposed species

The following proposed changes would meet the purpose and needs identified in Chapter I by conveying more specific guidance for the management of all threatened, endangered, and proposed species and their habitat. All species would benefit from:

- I. Clarifying management for the protection and recovery of threatened, endangered, and proposed species.
- II. Updating the list of threatened and endangered species found on the Forest.

I. Clarifying management for the protection and recovery of all threatened, endangered, and proposed species.

Existing Forest-wide standards, monitoring and evaluation standards, and appendices would be edited to clarify the MNF's practices for managing, protecting, and aiding in the recovery threatened, endangered, and proposed species. They would provide more specifics as to how existing standards or policies should be executed. For instance, direction on page 84 of the *Forest Plan* states: "Management of habitat critical to endangered and threatened wildlife and fish species is considered the first priority management activity." If taken literally, this standard does not clearly state that management of habitat essential to threatened, endangered, and proposed plants, mollusks, insects, etc. that exist on the MNF,

now or in the future, would be considered the first priority management activity. It also does not clearly indicate that habitat occupied by these species, not just habitat identified as “critical” under the ESA, would be protected. A proposed standard would explicitly state that all threatened, endangered, and proposed species and their habitat would be protected. See additional proposed changes on the following pages.

Revisions to Forest-wide Standards

See Appendix A, pp. 2-6

- ✓ Management of habitat ~~critical~~ **essential to** threatened, endangered, and **proposed wildlife and fish** species is considered the first priority management activity (Forest-wide standard #1).
- ✓ Forest personnel will work with State agencies and the **U. S. Department of the Interior**, Fish and Wildlife Service ~~U. S. Department of the Interior~~ (**USFWS**) in identifying **habitat essential for** ~~endangered,~~ threatened, **endangered**, and **proposed** species ~~critical habitat areas~~ (Forest-wide standard #2).
- ✓ 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 (Forest-wide standard #3).
- ✓ The **U.S. Department of Agriculture Forest Service (USDA) (USFS)** will participate in the development of recovery plans for all threatened, ~~and~~ endangered, and **proposed** species (Forest-wide standard #4).
- ✓ **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** (Forest-wide standard #7).
- ✓ **When activities are proposed in areas with a likelihood of occurrence for threatened, endangered, and proposed species, take one of the following actions:**
 - (a) **Redesign the proposed action to avoid the area, or**
 - (b) **Conduct on-sites 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**
 - (c) **Assume potential presence of threatened, endangered, and proposed species and proceed with action if appropriate mitigation or beneficial measures can be implemented, or**
 - (d) **In rare instances where adverse effects to threatened, endangered, and proposed species cannot be avoided, the Forest will consult with the USFWS** (Forest-wide standard #8).
- ✓ **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** (Forest-wide standard #9).
- ✓ **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** (Forest-wide standard #10).
- ✓ **Determine and implement appropriate habitat management techniques to maintain or enhance populations of threatened, endangered, and proposed species** (Forest-wide standard #11).
- ✓ **Project analyses will consider, as needed, ways of minimizing or eliminating threats to threatened, endangered, and proposed species due to non-native invasive species** (Forest-wide standard #12).
- ✓ **Additional Forest-wide standards to address the specific needs of threatened, endangered and proposed ~~or status unknown~~ species, are identified below with standards applicable to each.** (Forest-wide standard #13).

Revisions to **Monitoring and Evaluation** Standards

Appendix A, pp. 42-43

- ✓ Survey for new populations of threatened, endangered, and proposed species.
- ✓ Identify and monitor threats to known threatened, endangered, and proposed species' populations. Evaluate the effectiveness of protection and management programs; redirect efforts as necessary.
- ✓ Monitor existing populations and new sites of threatened, endangered, and proposed species.
- ✓ Monitor federally listed threatened, endangered, and proposed species to meet requirements outlined in any Biological Opinion issued by the USFWS for the MNF as a result of formal consultation.

Revisions to **Appendices**

Appendix A, p. 44

- ✓ No earth disturbance or vehicle use will be permitted at known locations of ~~running buffalo clover~~ **threatened, endangered, and proposed plant species** (Appendix K, page 17 (8)).

II. Update the list of threatened and endangered species found on the Forest.

Forest-wide standards would be modified to address past or future changes in the USFWS Threatened and Endangered Species List. For instance, the small whorled pogonia (*Isotria medeoloides*) and the VA spiraea (*Spiraea virginiana*) are threatened and endangered species of the MNF that are protected by direction on page 84 of the *Forest Plan*. They have not been listed as an existing *Forest Plan* standard since the small whorled pogonia was found on the MNF or the VA spiraea was recognized as threatened. Referencing the USFWS list in the *Forest Plan* as proposed would make it obvious the *Forest Plan* covers species that may be listed or found on the MNF now or in the future.

Revisions to **Forest-wide** Standards

See Appendix A, pp. 2-3

- ✓ The following federally listed threatened and endangered species are known to occur or may occur on the MNF (Forest-wide standard #5):

<u>Common Name</u>	<u>Scientific Name</u>
bald eagle	Haliaeetus leucocephalus
Cheat Mountain salamander	Plethodon nettingi nettingi
Indiana bat	Myotis sodalis
Virginia big-eared bat	Corynorhinus townsendii virginianus
West Virginia northern flying squirrel	Glaucomys sabrinus fuscus
running buffalo clover	Trifolium stoloniferum
shale barren rock cress	Arabis serotina
small-whorled pogonia	Isotria medeoloides
Virginia spiraea	Spiraea virginiana

- ✓ 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 (Forest-wide standard #6).

ALTERNATIVE 1

This alternative was developed to meet the purpose and need for action identified in Chapter 1 and to respond to Issue #2 on page 8 of Chapter I. Appendix A lists the standards that would be changed under Alternative 1, and Appendix B displays maps of Alternative 1. Alternative 1 was developed to minimize the long-term, adverse effects on the Forest's ability to provide vegetative diversity for wildlife (including the Indiana bat) and timber outputs in a manner consistent with *Forest Plan* Goals #XI for economic efficiency and Goal #XVI for protecting natural resources (in this case, water quality) from degradation (*Forest Plan*, pp. 39-40).

Alternative 1 is the same as the Proposed Action except it would (I) permit large-scale tree felling activities within five-mile radii of Indiana bat hibernacula any time of the year; and (II) incorporate the two, optional "Conservation Recommendations" identified in the USFWS's *Biological Opinion*.

I. Permit large-scale tree felling activities within five-mile radii of Indiana bat hibernacula any time of the year.

As under implementation of the existing *Forest Plan*, tree felling and associated activities could be implemented any time of the year as long as project-level analyses deem such activities would be compatible with Indiana bat management and consistent with Terms and Conditions of the 2002 *Biological Opinion* (Appendix A, pp. 15 and 32). MP 6.3 and Zoological Area standards are not proposed to restrict summertime, large-scale tree felling within 5-mile radii of Indiana bat hibernacula.

II. Incorporate the two, optional "Conservation Recommendations" identified in the USFWS's *Biological Opinion*.

Alternative 1 proposes to incorporate the conservation recommendations of the USFWS' March 2002 *Biological Opinion* as Forest-wide standards. Such measures would promote the development of an outreach program specifically about eastern woodland bats species and the retention or creation of small pools of water during road abandonment to provide drinking water for forest bats.

Existing information standards on pp. 53-54 of the *Forest Plan* encourage the implementation of public information and education programs but do not specify that such programs must be about Indiana bats. Proposed standards would specify that some of these programs must be focused on Indiana bat management.

Existing wildlife standards call for the maintenance of at least one permanent water source per so many square miles or acres (*Forest Plan*, pp. 122, 137, 148, and 177). Proposed standards would specify that pools of water would be retained or created during road abandonment work, as appropriate.

Revisions to Forest-wide Standards

See Appendix A, p. 10

- ✓ **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** (Forest-wide standard #13(c)(12)).
- ✓ **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** (Forest-wide standard #13(c)(13)).

ALTERNATIVE 2

Alternative 2 was developed to meet the purpose and need for action that was described on page 2 of Chapter I and address Issue #1 on page 8 of Chapter I. This alternative was designed to maximize roost tree protection and reduce potential for incidental “taking” of an Indiana bat more than any other alternative.

Alternative 2 differs from the Proposed Action in four ways. (I) MP 6.3 areas would not be created and ~158,000 acres would be designated as Zoological Areas to provide protection for Indiana bat hibernacula, key areas, land within two-mile radii of maternity colonies, AND primary range (Appendix A, pp. 5, 7, and 30)(maps in Appendix B display changes in land allocations). (II) Large-scale tree felling activities within five-mile radii of hibernacula could be implemented year round (Appendix A, p. 32). (III) Commercial timber harvests would be prohibited within five-mile radii of Indiana bat hibernacula and within two-mile radii of maternity colonies (Appendix A, 2400, #1, p. 32); only non-commercial methods of vegetation management could be used to create a variety of tree species, sizes, and age classes for Indiana bats and other wildlife (Appendix A, 1900, #3, p.31). (IV) Conservation Recommendations identified in the USFWS’s *Biological Opinion* would be incorporated (Appendix A, #13(c)(12) and #13(c)(13), p. 10).

I. Land within five-mile radii of Indiana bat hibernacula and within a two-mile radius of maternity colonies would be managed via Zoological Area standards.

Existing Zoological Area standards provide protection for Indiana bat habitat within 200-foot radii of Indiana bat hibernacula and maternity colonies, and 330-foot corridor to foraging areas.

Alternative 2 proposes to expand existing Zoological Area boundaries to five-mile radii around hibernacula and 2-mile radii around Indiana bat maternity colonies. The Zoological Areas would be labeled as OA 838 and managed via MP 8.0 and Zoological Area standards.

Revisions to Forest-wide Standards

See Appendix A, pp. 5 and 7

- ✓ **The area of influence for Indiana bats is recognized as three distinct areas—hibernacula, key areas, and primary range—all of which will be assigned to MP 8.0, Opportunity Area 838. Forest wide, MP 8.0, and Zoological standards for OA 838 will be used to manage Indiana bat populations (Forest-wide standard #9(b)).**
- ✓ ~~Identified nursery colonies, hibernation sites, and~~ **Hibernacula, maternity colonies, key areas, and the primary range of the Indiana bat will be managed under MP 8.0 and Zoological Area standards for Opportunity Area 838. ~~Forage habitat will be managed under~~ Forest-wide riparian area standards, 2670 C and the following standards also will be used to manage these areas (Forest-wide standard #13(c)(1)).**

Revisions to Zoological Area Standards

See Appendix A, pp. 30-31

- ✓ Opportunity areas will be defined as:

A 5-mile radius around hibernacula that contains the following elements: 1) hibernacula (caves and cave entrances); 2) key area (area near hibernacula that includes mature stands); 3: primary range (stands adjacent to key area, up to 5 miles radius from cave entrances); and/or

Land within two miles of a maternity colony for the Indiana bat, unless consultation with the USFWS on a site-specific basis indicates otherwise (Zoological Area standard, 2(a) and (b)).

- ✓ **OA 838 will not be created from MP 5.0, 6.2, or other 8.0 areas (Zoological Area NEPA standard, #4).**

II. Large-scale tree felling activities could be implemented year round.

Existing Forest Plan standards allow large and small-scale tree felling and associated activities to be implemented any time of the year, as long as project-level analyses deem such activities would be compatible with Indiana bat management and are consistent with Terms and Conditions of the 2002 *Biological Opinion* (Appendix A, pp. 15 and 32). Alternative 2 does not propose to restrict summertime, large-scale tree felling within 5-mile radii of Indiana bat hibernacula.

III. Commercial timber harvests would be prohibited within five-mile radii of Indiana bat hibernacula and within two-mile radii of maternity colonies.

Existing Forest-wide and MP standards do not prohibit commercial timber harvesting within Indiana bat habitat. Existing Zoological Area standards allow vegetation treatments to be undertaken within 200 feet of Indiana bat hibernacula if coordinated with bat habitat requirements in the Opportunity Area (OA)(*Forest Plan*, p. 231).

Alternative 2 does not propose to add timber management standards to the *Forest Plan* like the Proposed Action because it proposes to prohibit commercial timber harvests within 5-mile radii of Indiana bat hibernacula and within 2-mile radii of their maternity colonies (Appendix A, Zoological Area standards, 2400 #1, p. 32). Non-commercial methods could still be used, if a site-specific analysis deemed non-commercial methods were appropriate in a particular location.

Revisions to Zoological Area Standards

See Appendix A, p. 32

- ✓ **Commercial timber harvests may not occur within the primary range, key areas, or within two miles of maternity colonies** (Zoological Area 2400 Timber standard, #1).

IV. Conservation recommendations would be incorporated.

Like Alternative 1, Alternative 2 would incorporate the conservation recommendations of the USFWS' March 2002 *Biological Opinion* (see description of Alternative 1 for an explanation of existing standards).

Revisions to Forest-wide Standards

See Appendix A, p. 10

- ✓ **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** (Forest-wide standard #13(c)(12)).
- ✓ **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** (Forest-wide standard #13(c)(13)).

COMPARISON OF THE ALTERNATIVES

The following table displays the acres that would be designated to each MP under the various alternatives. See Appendix B for the maps that show the distribution of NFS acres by MP and Zoological Areas.

Table A. Acres assigned to each MP under the various alternatives.

Management Prescriptions/OA	Acres Assigned to Each MP by Alternative*			
	No Action	Proposed Action	Alternative 1	Alternative 2
1.1, Mineral extraction developments	0	0	0	0
2.0, Uneven-aged (shade tolerant)	17,000	14,000	14,000	14,000
3.0, Large trees for forest products	181,000	128,000	128,000	128,000
4.0, Conifer/Motorized	900	400	400	400
5.0, Wilderness	79,000	79,000	79,000	79,000
6.1, Remote Habitat/Mix of forest products	424,000	273,000	273,000	273,000
6.2, Semi-primitive, Non-motorized recreation	127,000	127,000	127,000	127,000
6.3, Indiana Bat (IBAT) primary range	NA	156,000	156,000	NA
7.0, High Density Developed Recreation	1,500	1,000	1,000	1,000
8.0, Special areas, excluding threatened and endangered species Zoological Areas	12,000	12,000	12,000	12,000
832, WV northern flying squirrel suitable habitat	59,000	110,000	110,000	110,000
Zoological Area of VA big-eared bat habitat	15	15	15	0**
Zoological Area where VA big-eared bat habitat overlaps with Indiana bat	25	25	25	40**
Zoological Area of Indiana bat habitat	3	2,500	2,500	158,000

*These GIS generated numbers are approximates; in most cases they have been rounded.

** Expansion of Indiana bat areas of protection would result in Indiana bat Zoological Areas overlapping with all VA big-eared bat Zoological Areas.

Table B on the following pages summarizes changes that would occur under the various alternatives. The specific standards that would be changed via the alternatives are described on pages 1-44 of Appendix A.

Table B. Comparison of the changes that would be made by the various alternatives.

Proposed Change		Comparison of changes to be made by the alternatives			
		No Action	Proposed Action	Alternative 1	Alternative 2
General Changes Applicable to More Than One Species	Would add, modify, and/or delete <i>Forest Plan</i> Standards.	No	Yes	Same as the PA EXCEPT — <ol style="list-style-type: none"> 1. Would implement Indiana bat “Conservation Recommendations” (Appendix A, p. 10). 2. Would not incorporate a standard that would impose a seasonal restriction on large-scale tree felling (Appendix A, pp. 15 & 32). 	Same as the PA EXCEPT – <ol style="list-style-type: none"> 1. Would designate the primary range of Indiana bats to Zoological Areas instead of MP 6.3 (Appendix A, pp. 5, 7, and 30). 2. Would implement Indiana bat “Conservation Recommendations” (Appendix A, p. 10). 3. Would not incorporate a standard that would impose a seasonal restriction on large-scale tree felling (Appendix A, p. 31). 4. Would prohibit commercial, timber harvests within the primary range, key areas, or within two-mile radii of maternity colonies of Indiana bat hibernacula (Appendix A, p.32).
	Would make minor edits to existing standards to clarify the Forest’s existing practices to manage threatened, endangered, and proposed species.	No	Yes	Yes, same as PA	Yes, same as PA

Table B. Comparison of the changes that would be made by the various alternatives.

		Comparison of changes to be made by the alternatives			
Proposed Change		No Action	Proposed Action	Alternative 1	Alternative 2
Indiana bats	Would Incorporate Mandatory Terms and Conditions that implement Reasonable and Prudent Measures of the USFWS's <i>Biological Opinion</i> .	No	Yes	Yes, same as PA	Yes, same as PA
	Would adopt the two, optional Conservation Recommendations of the USFWS's <i>Biological Opinion</i> .	No	No	Yes	Yes
	Extend Zoological Area protections to key areas (at least 150 acres of mature stands near Indiana bat hibernacula) and maternity colonies (land within two-mile radii of a known maternity site). Proposed standards would restrict certain activities within hibernacula, key areas, and near maternity colonies.	No Zoological Area protection for Indiana bat would only apply to hibernacula & maternity colonies, land within 200 feet around them, and a 330-foot foraging corridor from hibernacula to foraging habitat (<i>Forest Plan</i> , (p. 230).	Yes	Yes	Yes Plus, the primary range of Indiana bats would be designated as a Zoological Area.
	Would establish MP 6.3 standards for the management of Indiana bat primary range. This would increase the acres that would be specifically designated for Indiana bat management.	No	Yes	Yes, same as PA	No The primary range of Indiana bat would be designated as Zoological Areas.

Table B. Comparison of the changes that would be made by the various alternatives.

		Comparison of changes to be made by the alternatives			
Proposed Change		No Action	Proposed Action	Alternative 1	Alternative 2
Indiana bats	Would exceed protection mandated for the Indiana bat by the USFWS's <i>Biological Opinion</i> .	No	Yes Additionally, it would seasonally restrict large-scale tree felling activities within key areas, near maternity colonies, and the primary range of Indiana bats.	Yes However, it would not adopt seasonal restrictions. It would adopt USFWS' two conservation recommendations.	Yes Additionally, it would prohibit commercial timber harvests (within key areas, near maternity colonies, and in the primary range, regardless of the season) <u>and</u> adopt USFWS' two conservation recommendations.
	Would allow vegetation management (e.g. prescribed burning, tree girdling, small-scale tree felling, etc. to meet non-timber related objectives) within <u>key areas</u> and within two-mile radii of <u>maternity colonies</u> .	Yes	Yes, if needed for Indiana bat or public safety	Yes, same as PA	Yes, same as PA
	Would allow vegetation management (e.g. prescribed burning, tree girdling, small-scale tree felling, livestock grazing, etc. to meet non-timber related objectives) within the <u>primary range</u> to improve or enhance Indiana bat habitat, to maintain or enhance natural vegetative communities on appropriate sites, or for public safety.	Yes	Yes	Yes, same as PA	Yes However, the primary range would be designated as Zoological Areas instead of MP 6.3; and commercial vegetation management could <u>not</u> be implemented to maintain or enhance natural vegetative communities on appropriate sites.

Table B. Comparison of the changes that would be made by the various alternatives.

		Comparison of changes to be made by the alternatives			
Proposed Change		No Action	Proposed Action	Alternative 1	Alternative 2
Indiana bat	Would allow timber production as a secondary objective in Indiana bat primary range. Commercial tree harvesting would be allowed within the <u>key area</u> , within two-mile radii of <u>maternity colonies</u> , and in the <u>primary range</u> if it would not adversely affect the Indiana bat.	Yes	Yes, but only if conducted November 16 th – March 31st. Also, timber harvesting in key areas would likely be more restricted than in the primary range.	Yes, same as PA except no seasonal restriction on timber harvesting would be imposed at the programmatic level.	No. Commercial timber harvesting would be prohibited, regardless of the season.
	Would prohibit large-scale tree felling within <u>key areas</u> , within two-mile radii of <u>maternity colonies</u> , and in the primary range of Indiana bat hibernacula beginning April 1 through November 15.	No	Yes	No	No, but large-scale tree felling is not likely to occur under Alternative 2 because commercial timber harvests would be prohibited.
WV northern flying squirrels	Would change the standards used for identifying and managing WV northern flying squirrel habitat. It would delete Appendix X of the <i>Forest Plan</i> and adopt <i>Guidelines for Habitat Identification and Management</i> identified in the <i>Appalachian Northern Flying Squirrels' Recovery Plan (Updated)</i> .	No	Yes	Yes, same as PA	Yes, same as PA

COMPARISON OF THE ALTERNATIVES' EFFECTS

This section provides a summary of the effects of implementing each alternative.

Threatened & Endangered Species

The actions proposed under all action alternatives would promote the conservation and recovery of threatened and endangered species on the MNF (Biological Evaluation, Appendix G, p. 38). All alternatives would allow some activities that could result in disturbance to threatened and endangered species or their habitats. With the exception of the Indiana bat, the amount or scale of these activities (combined with the protective measures that have been, or are proposed for implementation) render these impacts discountable. Thus, the following determinations of effects have been made (Appendix G, p. 38). These determinations apply to all alternatives.

Bald eagle

May Affect, Not Likely To Adversely Affect.

Cheat Mountain salamander

May Affect, Not Likely To Adversely Affect.

VA big-eared bat

May Affect, Not Likely To Adversely Affect.
This determination is made for both the VA big-eared bat and its designated critical habitat.

WV northern flying squirrel

May Affect, Not Likely To Adversely Affect.

Running buffalo clover

May Affect, Not Likely To Adversely Affect.

Shale barren rock cress

May Affect, Not Likely To Adversely Affect.

Small-whorled pogonia

May Affect, Not Likely To Adversely Affect.

VA spiraea

No Effect.

Proposed Species and Habitat

No effect.
Currently there are neither species proposed for listing on the MNF nor any proposed critical habitat.

Indiana bat

May Affect, Likely To Adversely Affect.
No effects beyond those previously disclosed and addressed in the *Revised Biological Assessment* (USFS, 2001) and *Biological Opinion* (USFWS, 2002).

For the Indiana bat, the determination of May Effect, Likely to Adversely Effect is made as a result of large-scale tree removal activities (e.g. timber sales, road construction, minerals, and prescribed fire) that could occur in all alternatives. Tree removal either in the areas of influence for the Indiana bat or beyond (forest-wide) during the non-hibernation period (April 1 - November 15) may directly result in mortality (take) of an individual roosting Indiana bat, if a tree containing a roosting bat is removed either intentionally or felled accidentally. Even if a bat using a roost tree that is removed were not killed during the removal, the roosting bat would be forced to find an alternative tree, potentially expending a significant amount of energy that would result in harm or harassment of the individual. This also would constitute take (USFWS, 2002).

The determination of effects of *Forest Plan* implementation on Indiana bat is documented in the *Revised Biological Assessment*, and has been reviewed by the USFWS, which issued its concurrence with the *Revised Biological Assessment's* determinations in the form of a *Biological Opinion*. All action alternatives would amend the *Forest Plan* to include the Terms and Conditions contained within the *Biological Opinion*. These Terms and Conditions were identified by the USFWS as measures to minimize impacts to Indiana bat. Consequently, all action alternatives fall within the scope addressed

in the USFWS *Biological Opinion* and within the level of take identified in the Incidental Take Permit. The USFWS, as documented in the *Biological Opinion*, concluded that implementation of the *Forest Plan* with the mandatory Terms and Conditions was not likely to jeopardize the continued existence of the Indiana bat (USFWS, 2002). Based on the analysis of effects contained in the Biological Evaluation in Appendix G, the MNF has determined that the proposed *Threatened and Endangered Species Amendment to the Forest Plan* and its action alternatives would have no additional effects to Indiana bat that were not previously disclosed and evaluated during the programmatic consultation on the *Forest Plan*.

Sensitive Species

Implementation of all the alternatives, including the No Action, has some potential, however minor, to impact individuals of any given Regional Forester's Sensitive Species (Appendix G, p. 40). However, under all alternatives this would not lead to loss of viability or trend towards federal listing. All alternatives would be consistent with the Forest goal for RFSS management; they all would "protect sensitive and unique species until their populations are viable" (*Forest Plan*, p. 37). Some proposed standards could benefit RFSS. For example, some standards proposed for Indiana bat and WV northern flying squirrel management may concurrently protect or enhance habitats used by RFSS (e.g. caves, pools of water, mature forests, high elevation mixed deciduous and coniferous forests, etc). None of the alternatives is likely to reduce the protection afforded to habitat occupied by RFSS; but implementation of the action alternatives (especially Alternative 2) could result in fewer disturbances to RFSS habitat that exists within Indiana bat and WV northern flying squirrel habitat.

Management Indicator Species

All alternatives would maintain minimum viable populations of MNF management indicator species and all native wildlife species, including endangered and threatened species (Chapter III, pp. 33-34, 37, and 40). Under all action alternatives, the existing *Forest Plan* would be amended to incorporate the Terms and Conditions of the *Biological Opinion* and implement the *Appalachian Northern Flying Squirrels' Recovery Plan (Updated)*, thereby increasing the probability of persistence for the Indiana bat and WV northern flying squirrel. None of the alternatives would change the Forest's ability to sustain the mix of habitats needed across the MNF to maintain minimum viable population of all existing native vertebrate species and retain or improve habitat of management indicator species.

Forest Type & Age Class Diversity

Alternative 1 and the Proposed Action have very similar effects to the Forest's ability to manage forest type and age class diversity (Chapter III, pp. 45-46, 48, and 51). The Forest would still be able to manage for age class diversity on those acres available to commercial timber management.

New vegetation management standards for land in the primary range of Indiana bats would be very similar to vegetation management on lands currently assigned to MP 6.1. The effects of implementing the Proposed Action or Alternative 1 are expected to be similar to the No Action.

Alternative 2 would allocate the same amount of land in MP 8 as the Proposed Action and Alternative 1 would to MPs 8.0 and 6.3, but the proposed standards would place more acreage into an MP where active management is limited (no commercial timber harvest in Indiana bat primary range).

The Forest would still be able to actively manage the forest for desired stand conditions and ages while precluding or reducing active management in other areas.

Silvicultural Program

None of the alternatives would noticeably affect the Forest's ability to use silvicultural tools to achieve Forest Goals IV and VI and produce various outcomes on the land considered available for active vegetation management (Chapter III, pp. 53-54). The effects of each alternative to silvicultural options available are largely the same. The main difference among alternatives is the amount of land where active management (commercial timber harvest or other vegetation manipulation) would be precluded.

Forest Health

The action alternatives would have very similar effects to the health of the MNF and the Forest's ability to manage health issues. The effects of the alternatives would be minor, no tool to actively manage the Forest in response to forest health issues would be precluded (Chapter III, pp. 55-58). Alternative 2 would be the most restrictive because it would preclude use of commercial timber management as a possible action to reduce impacts of insect and disease outbreaks.

Prescribed Fire

In terms of impacts to the prescribed fire program, there would be no difference between alternatives or adverse effects to the Forest's ability to use prescribed fire as a vegetation management tool (Chapter III, pp. 59-60).

Air Quality

All of the alternatives would allow the MNF to achieve the Forest goal for air quality (*Forest Plan*, p. 40). They would not cause adverse or substantial changes to air quality (Chapter III, p. 60).

Soil & Water

All of the action alternatives, except possibly the Proposed Action, would allow the MNF to meet the *Forest Plan* soil and water protection goal. Only the Proposed Action has the potential to have adverse effects to soil and water resources (Chapter III, pp. 63-64). If large-scale vegetation management occurred within MP 6.3 areas under the seasonal restriction standard of the Proposed Action, there is a substantial risk for adverse impacts to soil and water. This effect would be contrary to the *Forest Plan* goal of protecting soil and water resources from damage or degradation.

Riparian & Aquatic Resources

None of the action alternatives would substantially change the ability to implement riparian treatments and restoration activities (in-stream habitat maintenance, hillslope stabilization, coal mine restoration activities, or soil and water improvements) that would benefit riparian and aquatic resources (Chapter III, pp. 66-67). Under the Proposed Action, harvesting timber within five-mile radii of Indiana bat hibernacula only during the winter (while Indiana bat's are hibernating) would cause thirty-seven 6th level Hydrologic Units (HUCs) with wild trout streams to be at increased risk for trout habitat degradation. This is due to the increased likelihood of harvesting during wet periods and subsequent risk of these streams receiving sediment during periods of water run-off (see Soil and Water effects). No HUCs would be at increased risk if the No Action Alternative, Alternative 1, or Alternative 2 were selected for implementation. This is because the No Action Alternative and Alternative 1 would allow timber harvesting within a five-mile radii of Indiana bat hibernacula during drier periods of the year, not just in the winter; and Alternative 2 would prohibit commercial timber harvests within a five-mile radii of Indiana bat hibernacula.

Transportation

Overall, none of the alternatives are expected to affect the Forest's ability to construct and maintain road developments that allow efficient management and safe public use of National Forest lands to the density and standards needed to meet resource objectives (Forest Goal XV, *Forest Plan*, p. 40).

Action alternatives may result in some areas being unavailable for road construction or reconstruction (roughly 6,000-7,000 acres). Proposed alternatives could affect the management of the MNF's transportation system by potentially increasing road construction, reconstruction, and maintenance costs within, or to access, MP 6.3 areas (Chapter III, p. 70).

For example, the seasonal restriction for tree felling under the Proposed Action could lead the Forest to harvest more timber in the winter, mostly via helicopter removal. To minimize the potential for soil erosion and sediment delivery to streams during the winter wet period, roads to the cutting units or helicopter-landing site would likely need to be built to higher standards (e.g. more rock, shorter distances between culverts, etc.). Such actions would increase the cost of constructing, reconstructing, and maintaining roads. These costs could accumulate such that transportation system costs from managing the 156,000 acres of MP 6.3 could be much higher than under the No Action Alternative.

Timber Sale Program

None of the alternatives would prevent *Forest Plan* timber goals from being achieved; or prevent projected outputs from being accomplished if all other conditions (e.g. markets, staffing, budgets, etc.) are favorable (Chapter III, pp. 74-80). All the alternatives would reduce the number of acres potentially available to be managed for timber production; but none of them would reduce the acres available and managed for timber production below the 331,000 acres that were identified as necessary to meet projected timber outputs. Differing ways of managing Indiana bat and WV northern flying squirrel habitat would cause variation between the alternatives' effects to the potential timber base. The effects of Cheat Mountain salamander, threatened and endangered plants, bald eagle, and VA big-eared bat management to the timber base would be the same under all alternatives.

The No Action Alternative would reduce the acres available for timber production the least; Alternative 2 would reduce it the most. The Proposed Action and Alternative 1, would reduce the pool of potential timber base the same amount, however, the Proposed Action would result in ~117,000 acres within five-mile radii of Indiana bat hibernacula largely becoming helicopter-required harvest areas because of the proposed timing restriction on felling operations. Alternative 1 would not impose a timing restriction on timber felling operations in Indiana bat primary ranges that could potentially affect the acres available for timber production. Because of this, as many as 117,000 acres within Indiana bat primary range would potentially be available to conventional harvesting operations – which could result in a substantial benefit to local companies as well as a substantial reduction in harvesting costs. Alternative 1 would maintain helicopter logging as a viable management tool, but would not force its use where it would otherwise be unnecessary. Alternative 2 would have the most affect on the pool of potential timber base because it would reduce the pool to ~344,000 acres.

Minerals

The action alternatives' standards for threatened and endangered species would not have noticeably different effects on Federally owned coal, Federal oil and gas available for leasing, exploration and development than the No Action Alternative (Chapter III, pp. 83-85). None of the alternatives would noticeably change the Forest's ability to manage mineral resources as they have been managed in the past.

Range

The *Forest Plan* goal for management of range resources may be met under any alternative. None of the alternatives would change the Forest's ability to manage range resources as they have been managed in the past (Chapter III, pp. 85-86). All existing allotments could continue to be used and would provide the same number of animal unit months as they have in recent years--unless future, site-specific conditions indicate that changes are necessary to resolve resource concerns or address increases or decreases in public demand.

Recreation

Regardless of the alternative selected, recreation use on the MNF is expected to continue to increase; existing facilities would continue to be maintained; and all opportunities that are currently available to MNF visitors would still be provided in the future (Chapter III, pp. 88-91). Also, the same miles of trail construction and reconstruction could be accomplished regardless of the alternative. The action alternatives could cause site-specific effects, but site-specific analysis would have to be done to determine impacts to individual sites.

Lands Management & Special Use Administration

Forest goals for the land adjustment and special uses programs could be met under any of the alternatives (Chapter III, pp. 92-95). Outputs for all alternatives would be similar to those that have been provided in the past (see "Affected Environment" for lands and special uses). Procedures for administering the Land Adjustment and Special Uses Programs would remain essentially the same under all alternatives, even though areas managed for Indiana bat and WV northern flying squirrels may be allocated differently or expanded. Similarly, criteria for evaluating effects of proposals on threatened, endangered, and sensitive species would stay the same under the proposed amendment. Individual land adjustment activities and special use proposals would continue to be evaluated on a project-by-project, site-specific basis. Under all alternatives, priority would be given to acquiring tracts of land that provide habitat for threatened and endangered species, and NFS lands that provide suitable habitat for threatened and endangered species would not normally be exchanged. In most cases, permits that expire periodically and require applications for renewal of activities would be renewed; this is because (1) many existing uses occur in areas that do not provide suitable habitat for threatened and endangered species, or (2) they utilize existing facilities such as Forest roads and trails and would have little direct effect on suitable habitat. Site-specific mitigation would be implemented as needed to minimize or prevent adverse impacts to threatened and endangered species.

Heritage Resources

Generally, the implementation of proposed standards under any of the alternatives are not expected to result in adverse effects to significant or potentially significant archaeological sites or affect the manner in which heritage sites are managed on the Forest (Chapter III, p. 95). However, cases may arise in which limited habitat (i.e., vegetation) may need to be altered or removed to protect archaeological or historic resources. In such cases, however infrequent, site-specific decisions will need to be made.

Special or Unique Areas

None of the alternatives would hinder the Forest's ability to manage or protect unique or special areas, and in the case of endangered bats and the WV northern flying squirrel, action alternatives would improve the Forest's ability to protect and manage for the recovery of these species (Chapter III, p. 96).

Scenery

None of the alternatives are expected to noticeably change the way the Forest manages visual quality or result in substantial adverse scenery effects (Chapter III, pp. 97-99). Visual quality standards would be met under all the alternatives. The major difference between the No Action Alternative and the action alternatives would be the change in number and location of acres that would be managed for late-successional vegetative species.

Wetlands and Floodplains

Implementing proposed standards is not likely to result in adverse effects to floodplains or wetlands or change the way in which such resources are managed (Chapter III, p. 99). Proposed measures that would prevent soil disturbing activities from being implemented would be beneficial in that fewer acres of wetlands or floodplains may be affected. Implementation of any of the alternatives would be compliant with Executive Order 11988 (floodplains) and Executive Order 11990 (wetlands).

Wild & Scenic Rivers

Regardless of the alternative selected, river segments that are potentially suitable for designation as Wild and Scenic Rivers would continue to be protected so as not to preclude their designation (*Forest Plan*, pp. 70-71) (Chapter III, pp. 100-101).

Wilderness

Regardless of the alternative selected, all ~79,000 acres of Wilderness would continue to be managed to protect wilderness attributes for future generations, provide a wilderness experience, and preserve natural ecosystems (*Forest Plan*, pp. 153-163). The Forest goal for Wilderness management and the projected output for Wilderness would be achieved under all alternatives (Chapter III, pp. 102-103).

Economics

In regards to economics, none of the alternatives would substantially alter the opportunities for employment or reduce payments to county governments from recent levels. This is because the acreage of MNF lands available for oil and gas leasing, commercial timber production, and recreation use would remain within levels anticipated under implementation of the *Forest Plan*, as amended (Chapter III, p. 103). Consequently, payments to counties are not expected to be substantially affected.

Environmental Justice

None of the alternatives would pose disproportionately high and adverse environmental, human health, or social effect on counties within the proclamation boundary of the MNF (see effects documented for other resources. All the alternatives would be consistent with Executive Order 12898 (Chapter III, p. 104).

ALTERNATIVES NOT CONSIDERED IN DETAIL

During the scoping period for the Proposed Action, several alternatives were suggested for evaluation. After considering them all, four alternatives were carried forward for detailed analysis. Such a limited range of alternatives was considered in detail because the decision space for this analysis is extremely constrained by law:

- Under the Endangered Species Act of 1973, threatened, endangered, and proposed species must be protected. The potential for “taking” an endangered or threatened species should be minimized and a decision made that will meet Forest Service responsibilities for threatened, endangered, and proposed species consistent with the Endangered Species Act of 1973 and the approved recovery plans of each species.
- The Multiple Use Sustained Yield Act of 1976, which states that National Forests will be managed for multiple uses, prevents the Forest from making a programmatic decision to prohibit timber harvesting or mineral development on all NFS lands unless it is required to ensure consistency with another law.

The following are the alternatives that the interdisciplinary team considered but did not pursue in detail.

1. Protect threatened and endangered species by prohibiting mineral extraction and removing the entire Monongahela National Forest from timber production. Develop an alternative that provides for the justifiable ecological restoration needs of the MNF while minimizing or eliminating the negative impacts associated with logging. Implement a Restoration Alternative that prohibits commercial harvest of timber and natural gas development but allows noncommercial restoration activities such as road obliteration and watershed restoration.

- The *Forest Plan* was developed to maintain or enhance species composition, structure, and function of central Appalachian ecosystems, while providing various goods and services to the American people. It strongly emphasizes the protection and conservation of wildlife habitat, but it also allows for providing various goods and services in the context of multiple use management.

In July 1985, consultation with USFWS was completed for the *Forest Plan*. Six species were covered in that consultation: Eastern cougar (*Felis concolor cougar*), American peregrine falcon (*Falco peregrinus anatum*), bald eagle, VA northern flying squirrel (now referred to as the WV northern flying squirrel), Indiana bat, and VA big-eared bat. The USFWS opinion indicated that *Forest Plan* implementation would not likely jeopardize continued existence of Eastern cougar, VA big-eared bat, and Indiana bat. Their opinion for peregrine falcon and bald eagle was that *Forest Plan* implementation would promote their conservation. Similarly, their opinion for VA northern flying squirrel was that implementation likely would not jeopardize its continued existence, and it may promote its conservation. Cheat Mountain salamander, shale barren rock cress, VA spiraea, running buffalo clover, and small-whorled pogonia were not included in this consultation because they were not listed species at that time.

The *Forest Plan* has been amended five times since it was approved. For amendments that could affect threatened and endangered 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 and concurred with MNF findings that these actions would not jeopardize threatened and endangered species.

More recently, using new information gained since 1986, the MNF completed an additional programmatic biological assessment on the effects of continued implementation of the 1986 *Forest Plan*, as amended on threatened and endangered species. This analysis, documented in the *Revised Biological Assessment* (USFS, 2001), concluded again that, with the exception of the Indiana bat, the continued implementation of the *Forest Plan* provides ample protection to threatened and endangered species and would result in either no effect or may affect, but not adversely affect threatened and endangered species found on the MNF. USFWS has concurred with these findings and concluded in their *Biological Opinion* that continued implementation of the *Forest Plan*, as amended to date, (including logging and mining activities) would not jeopardize any of the listed species. Additional protections needed for the Indiana bat identified in formal consultation with USFWS have been taken forward into this analysis.

A Forest-wide ban on timber harvesting and mineral development is not necessary to protect threatened, endangered, and proposed species. Not all acres of the Forest are occupied by, or provide potential habitat for, threatened, endangered, and proposed species (see Threatened and Endangered Species effects in Chapter III). Such restrictions may be appropriate for consideration in some areas of the Forest and have been carried forward in this analysis where appropriate, other areas could be analyzed at the project level as needed. Bans on these activities applied to the entire Forest would be inconsistent with Forest management policies, the Multiple Use Sustained Yield Act, and may not be in the best interest of some wildlife, including threatened, endangered, and proposed species, that may benefit from vegetation management.

2. Emphasize/prioritize threatened and endangered species by changing the Forest Plan's emphasis from even-aged management to uneven-aged management.

- Currently, some areas of the Forest are managed under even-aged management and some areas under uneven-aged techniques (single tree selection and group selection harvesting) as appropriate to site conditions and the purpose of and need for timber harvesting. These activities were described and the effects on threatened and endangered species fully analyzed in the *Revised Biological Assessment* (pp. 9-16 and 24-115). As part of this assessment, MNF biologists concluded that, although tree felling associated with either of these management techniques would have the potential to directly adversely effect the Indiana bat, the indirect effects of applying these silvicultural practices would not likely adversely effect Indiana bat habitat. Impacts to other threatened and endangered species were determined to have no effect or not likely to be adversely effect these species. USFWS concurred with these findings (USFWS correspondence 11/2001). Uneven-aged management is not precluded by any of the alternatives and may be used to maintain or improve conditions for the Indiana bat within the five-mile area of influence and in the general Forest areas that allow for timber harvest. However, uneven-aged management practices are not designed to regenerate the full range of forest types found on the MNF.

Most forested stands on the Forest are currently even-aged, and it is generally accepted that converting an even-aged stand to an uneven-aged one is very difficult and can degrade stand quality. In these even-aged stands, there may be a range of diameters, but this does not always correspond to a range of ages for all species. Stands consisting of different tree species with differing growth rates, further complicate the application of uneven-aged management – including management of the understories that have been shown to be important factor in providing preferred Indiana bat habitat. Under uneven-aged management if harvests remove large diameter trees, the trees that remain generally represent slower growing trees of the same age as the ones removed, not younger trees. These slow growers may not replace the larger

diameter trees and the preferred habitat elements that they provide. Even-aged management allows for the regeneration and establishment of shade intolerant and shade tolerant species and of species that are tolerant of some shade but require release to become dominant in the overstory. With the mix of tree species found on the Forest the application of uneven-aged management would tend to eliminate tree species requiring lots of sunlight in the early stages of development, such as most hard mast species. This may have long reaching and potentially negative effects on other threatened and endangered and numerous other wildlife species on the MNF. A decision to eliminate even-aged management of northern hardwood habitats from the MNF could affect the Forest's ability to achieve the existing Forest goal of improving "diversity of plants, animals, and stand conditions with an emphasis on the habitat needs for wild turkey, black bear, and associated species" (*Forest Plan*, p. 38).

Changing the *Forest Plan*'s emphasis from even-aged management to uneven-aged management has not been determined to be necessary for the protection and recovery of threatened and endangered species found on the Forest. This alternative is not ripe for decision at this time. Such a decision would require significantly greater, and different, analysis to be completed, analysis that is not required to make a decision regarding the purpose and need that was defined in Chapter I. This alternative could be addressed during the *Forest Plan* revision process currently underway; or it may be considered, as needed, in some areas of the Forest during project-level analyses. For example, it may be applied to Indiana bat primary range in order to "improve or enhance Indiana bat habitat, to maintain or enhance natural vegetative communities on appropriate sites (see Forest-wide standards and guidelines 1900 – Vegetation) or for public safety" (Appendix A, p. 15). Further, the USFWS stated: "After reviewing the current status of the Indiana bat, the environmental baseline of the action area, and the anticipated effects of the continued implementation of the 1986 *Forest Plan*, as amended, [which includes even-aged management (added)], it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the Indiana bat" (USFWS, 2002 *Biological Opinion*).

The proposed plan amendment is primarily needed because the existing *Forest Plan* does not contain standards that would minimize the "taking" of an individual Indiana bat and implement the "Terms and Conditions" of the 2002 *Biological Opinion* nor does the *Forest Plan* incorporate changes to the *Appalachian Northern Flying Squirrel's Recovery Plan (Updated)*.

With regard to the Indiana bat a full, well-integrated understanding of the needs of this endangered species is yet to be attained. Habitat use has been shown to vary greatly from flood plain and riparian forest, to upland forest, and even highly altered landscapes that include old fields and pastures (USFWS, 2002). Callahan et al. (1997) suggested that management practices, such as even-aged and uneven-aged management, could be used if they include provisions for snag retention and if oaks and shagbark hickories are favored. In eastern Kentucky on the Daniel Boone National Forest, MacGregor et al. (1999) has found that Indiana bats will avoid clearcuts but will use other forms of even-aged harvests for roosting. They reported that two-aged and shelterwood harvests could produce different amounts of male Indiana bat roosting habitat in autumn depending on the harvests' snag retention. Their suggested guidelines called for retention of all snags, hollow trees, live trees with large dead limbs and shagbark hickories. These guidelines produced stands with 15 times the number of roost trees when compared to conventionally managed two-aged and shelterwood harvests that retain only 5 snags/ha.

In 2002, Menzel et al. completed "A Review of the Forest Habitat Relationships of the Indiana Bat (*Myotis sodalis*)."

This report is intended to be a reference document for information about

the ecology and habitat use of the endangered Indiana bat (*Myotis sodalis*). They present a synthesis and critical review of existing literature on the use of hibernacula, roost trees, and foraging habitat. An extensive list of literature on all aspects of Indiana bat biology is provided. This report attempts to condense all existing knowledge on Indiana bats into one document that is useful to wildlife biologists and land managers to aid the decision making process regarding issues impacting Indiana bats. Upon completion of this review, they concluded that:

- Reported research on foraging and roosting habitat use during the pre-hibernation swarm and post-hibernation emergence is limited. Similarly, Indiana bat food habits during these critical periods are poorly documented.
- Indiana bat roost trees have been reported within forests above and below the canopy and among isolated trees or single trees in open areas such as wetlands, fields and pastures with correspondingly wide ranges in actual solar exposure from completely shaded to completely exposed.
- No quantitative studies exist that adequately describe forest stand species composition or stand structure surrounding occupied Indiana bat roosts. Forest cover around Indiana bat roosts ranges from close to 100% in the Appalachians to < 33% in the agricultural Midwest.
- Indiana bats use a wide variety of habitats for foraging. These habitats include riparian areas, upland forests, ponds, and fields. The effects of various timber harvest methods on Indiana bat foraging patterns remains unknown.

Additional research is needed to examine how various timber harvest methods (e.g., shelterwood, deferment, and clearcut harvests) affect the suitability of Indiana bat habitat on the MNF. However, anecdotal evidence suggests that Indiana bats may benefit from limited disturbance around potential roosting areas. Limited disturbance can create potential roost trees (Gardner et al., 1991) and open the canopy around potential roost trees (Gardner et al., 1991, Kurta et al., 1993). Currently, there is little evidence (with the exception of direct “take”) that, at the landscape scale, even-aged management as practiced on the MNF is detrimental to Indiana bat or that un-evenaged management Forest-wide would clearly benefit the bat.

With regard to WV northern flying squirrel, data and scientific information collected on this endangered species would indicate no clear need for the implementation of un-evenaged management or timber harvest of any kind at this time.

3. Modify standards and guidelines for all threatened and endangered species including bald eagles.

- Project-level analyses conducted on the MNF since 1986 and analyses documented in the *Revised Biological Assessment* have not identified a need to change standards for all species, including the bald eagle (USFWS Correspondence, 11/09/2001). Existing standards are considered adequate for most MNF species’ management. As stated in the USFWS’s correspondence 11/09/2001, “The Service [USFWS] believes that the BA [*Revised Biological Assessment*] adequately evaluates the results of the continued implementation of the LRMP [*Forest Plan*], with amendments, on the nine (9) federally listed species which occur on the MNF. The Service concurs with the BA’s determinations that continued implementation of the LRMP, with amendments, will not negatively impact the following eight (8) federally listed species. These determinations and species include a “No Effect” for the threatened Virginia spiraea, *Spiraea virginiana* and a “May Affect, Not Likely to Adversely Affect” for the threatened Bald eagle, *Haliaeetus leucocephalus*; the threatened Cheat Mountain salamander, *Plethodon nettingi*; the endangered Virginia big-eared bat, *Corynorhinus townsendii virginianus*; the endangered West Virginia northern flying squirrel; the endangered Running

buffalo clover, Trifolium stoloniferum; the endangered Shale barren rock cress, Arabis serotina; and Small whorled pogonia, Isotria medioloides. Therefore, no further Section 7 consultation under the ESA is required with the Service on these species at the programmatic level.”

4. Assign all threatened, endangered, and proposed species to MP 8.0. Develop an alternative that would assign the entire range of the Cheat Mountain salamander on the MNF to a special management area designation (e.g. Special Biological Area) with minimal disturbance allowed.

- As stated in the *Revised Biological Assessment*, existing *Forest Plan* direction is considered adequate to protect threatened, endangered, and proposed species found on the MNF except the Indiana bat and WV northern flying squirrel; and, as mentioned before, the USFWS concurred with the determinations in the *Revised Biological Assessment*. Action is proposed to address the needs of the Indiana bat and WV northern flying squirrel (see Chapter I “Purpose and Need” and description of alternatives in Chapter II and Appendix A).

5. Increase or decrease the acreage managed for the WV northern flying squirrel, and Indiana bat more so than the Proposed Action. For example, some asked that the area managed for the Indiana bat be extended up to 10 miles from known hibernacula. Others asked that the area managed be less than 5 miles of Indiana bat hibernacula.

- The MNF worked closely with the USFWS and the Northeast Research Station to identify the area and level of management needed for these species. MNF biologists have reviewed current manuscripts on Indiana bat and the proposed standards are based upon the best available scientific information regarding these species ecological requirements and designed to protect and enhance Indiana bat habitat. More detail regarding the scientific information used may be found in the *Revised Biological Assessment* (USFS 2001), the *Biological Opinion* (USFWS 2002), A Review of the Forest Habitat Relationships of the Indiana Bat (*Myotis sodalis*) conducted by the USFS Northeast Research Station (Michael A. Menzel, et al. 2001), the *Appalachian Northern Flying Squirrel’s Recovery Plan (Updated)*, *Developing a habitat model for the endangered Virginia northern flying squirrel (Glaucomys sabrinus fuscus) in the Allegheny Mountains of West Virginia* (Odum et.al. 2001), and other documents as cited in the EA.

The purpose of the areas of influence is to manage and conserve the habitat most likely to be used by the species for which it was established. In the case of Indiana bat it is the foraging habitat used by male Indiana bats in the summer, areas used for swarming in the fall, areas potentially used by females to rear young (maternity colonies) and caves used for wintering.

Research used to develop the *Revised Biological Assessment* and the *Biological Opinion* indicates that the habitat most likely to be used by male bats in the summer is an area within five miles or less of the hibernacula. Radio-tracking work on male bats from 1976 through the present (25 years) across the range of the Indiana bat has found that male bats, which stay near the hibernacula during the summer and fall, forage and roost within 1- 4.2 miles of the hibernacula. Local research conducted by Stihler (1995) documented Indiana bat captures of male bats at hibernaculum beginning in June, and female bats starting in mid-August. Stihler (1997) found that Indiana bat males foraged and day roosted near hibernacula (within 3.5 miles, or 5.6 km) throughout summer. In Kentucky, male Indiana bats have been found up to 2.6 miles (4.2 km) from the hibernacula during the summer. During the fall, males have been reported from 1.8 – 4.2 miles (2.5 – 6.8 km) from the caves in Missouri and Kentucky. Size of areas managed for maternity colonies have similarly been established based upon information established by Gardner et al., 1991; Humphrey et al., 1977; and other researchers.

Because this is a migratory species, females and males that leave the hibernacula area in the summer will be found in their summer ranges – usually much further than 10 miles from the hibernacula and generally beyond the MNF. The majority of known maternity colonies are in states west of WV, such as Ohio and Indiana. However, it is recognized that Indiana bats may be found on the MNF during the non-hibernating period. A five-mile zone around hibernacula is considered sufficient to protect those foraging and swarming areas used by Indiana bats during these periods. Extensive summer surveys throughout WV, especially in and around the MNF (*Revised Biological Assessment*, Appendix 6) have supported research findings. Therefore, it is believed that reducing the areas to be managed would not provide adequate protection for Indiana bat. It is also reasoned that increasing this area to 10 miles would provide little or no additional protection to Indiana bat while having the potential to appreciably affect other forest resources. It is also recognized that a few Indiana bats may be found on the MNF farther than five miles from hibernacula in the spring, summer or fall but the probability of this is considered to be much lower. To address this, Forest-wide standards protecting certain habitat elements have been proposed.

The areas of influence (“suitable habitat”) for WV northern flying squirrel have been based upon occurrence records, current information as reflected in the *Appalachian Northern Flying Squirrel’s Recovery Plan (Updated)* and research conducted by the NE Research Station (Menzel et.al., 2001). Reducing the areas to be managed would not provide adequate protection for WV northern flying squirrel, and local survey information and research indicates that increasing the size of the areas to be managed would not provide a greater degree of protection for this species (see WV northern flying squirrel and bat survey data in each District’s official records and the TES Data at the Supervisor’s Office). If subsequent data confirms the need for further protection, that need can be reflected in the suitable map generated collaboratively with, and reviewed periodically by USFWS and WVDNR.

6. Designate as old growth all NFS lands within five miles of Indiana bat hibernacula.

- Again, the MNF worked closely with the USFWS to establish standards that would provide appropriate habitat for Indiana bats. The best available scientific information indicates that maintaining old growth on all NFS lands within five miles of hibernacula would not meet all the habitat requirements of the Indiana bat (*Biological Opinion*, pp. 9-14).

Existing *Forest Plan* standards provide for five percent of OAs to be managed for old growth and provide this diversity element. Under all action alternatives, 20 percent of MP 6.3 areas would be set aside for old growth; and key areas (a minimum of 150 acres of mature forest near to Indiana bat hibernacula) and maternity colonies would be protected. If these areas don’t provide old growth requirements of Indiana bats at the time of their designation, they will as the stands become older.

Action alternatives would require that an area of influence, along with a management recovery strategy, be determined for each Indiana bat hibernacula. These management strategies are to be determined on a site-specific basis for each individual cave, and they could vary depending on the existing conditions within the area and the habitat needed to benefit the species. It would be premature to determine without a site-specific analysis that the entire area should be old growth.

In addition, current scientific information does not support a need for the entire area of influence for Indiana bats (five-mile radii around hibernacula) to be managed for old growth. No published reports indicate that old growth is required in the entire area of influence. In fact, doing so may be detrimental to this endangered species. Various studies as shown in Menzel et al. 2002 have shown that Indiana bats use a wide variety of habitats for swarming, summer

roosting, foraging, and maternity colonies (Garner et al. 1991; Callahan, 1997; Kurta et al., 1993; Whitaker and Hamilton 1998). Of 48 roosts that Gardner et al. (1991) found in forested habitats, 32 were in closed-canopy forests (> 80%); 12 were in intermediate-canopy forests (30-80%); and 4 were in open-canopy forests (< 30%). Other researchers have documented a wide array of stand canopy closures associated with roost trees. Callahan et al. (1997) even suggested that management practices, such as even-aged and uneven-aged management, could be used if they include provisions for snag retention and if oaks and shagbark hickories are favored. Forest cover around Indiana bat roosts ranges from close to 100% in the Appalachians to < 33% in the agricultural Midwest. Romme et al. (1995) suggests that the preferred summer foraging habitat for Indiana bats is a forest with 50 to 70 percent canopy closure. Other studies indicate that Indiana bats forage in a diversity of habitat types, including uplands, in forested habitats, along the forest/stream edge in riparian areas, and along the edge of the pastures and old fields. Researchers have observed Indiana bats foraging in areas that had been selectively harvested (Gardner et al., 1991; MacGregor pers. observ., June 1997).

Based upon a review of available forest data, a large amount of the MNF is above optimal canopy closure for Indiana bat foraging habitat, but other conditions make most of the Forest potential habitat. Except for removing potential roost trees, indirect effects of thinning and single tree selection generally could benefit Indiana bat. Opening up the canopy cover improves foraging as well as roosting conditions. However, these effects are short-term, because canopy closure occurs in approximately five to ten years after most thinning or selection cutting. A more long-term effect of thinning and single tree selection is increased residual growth, creating larger diameter and more suitable roost trees. Damage to residual trees during felling can improve the roosting quality and quantity of residual trees; cavities, dens, and crevices are more likely to develop due to resulting pathogen and insect attack at the injury point (USFS 2001).

Designating all NFS lands within five miles of Indiana bat hibernacula as old growth would not provide all the diversity elements required by the Indiana bat. Likewise, it would limit the Forest's ability to achieve the existing Forest goal of improving "diversity of plants, animals, and stand conditions" (*Forest Plan*, p. 38) and providing various goods and services in the context of multiple use management.

7. Prohibit or require seasonal restrictions on large-scale tree felling and commercial timber harvests within five miles of some Indiana bat hibernacula but not all of them.

- Following a comprehensive review of the winter, summer, and fall behavior and habitat requirements of the Indiana bat completed for the *Revised Biological Assessment* and the *Biological Opinion*, it was determined that Forest management activities should incorporate standards to protect all known and historic hibernacula regardless of the numbers of bats occupying these hibernacula. Research indicates that 1) Indiana bats are very loyal to their hibernacula, 2) Some males spend the summer near the hibernacula in WV, and 3) Indiana bats also tend to hibernate in the same cave in which they swarm (USFWS, 2002).

In addition, Recovery Actions specified in the Draft Indiana bat (*Myotis sodalis*) Revised Recovery Plan, also emphasize that current hibernacula should be protected and abandoned hibernacula should be restored, if it is feasible to do so. The Draft Recovery Plan asserts that previously occupied caves that have been abandoned or have severely reduced populations due to heavy disturbance or adverse modification will likely be recolonized if protected (USFWS, 1999).

Given this guidance and direction, the MNF agreed with USFWS's recommendation that *Forest Plan* standards be written so that the same protection or management of Indiana bat habitat

could be applied to all known hibernacula. It is recognized, however, that each hibernaculum is unique and some hibernacula may need additional protection to address site-specific circumstances. This later concern is carried through the analysis by establishing areas of influences around all known hibernacula but providing flexibility in the management of these areas by allowing certain activities to be implemented in some areas as long as they improve or enhance Indiana bat habitat.

8. Do not identify OAs, or designate MP 6.3 areas for NFS lands that surround privately owned caves. Only identify OAs and designate MP 6.3 areas for caves located on NFS lands. Develop OAs and designate MP 6.3 areas only for caves with Indiana bat numbers greater than ten. Eliminate from analysis caves that only have historical records older than 5 or ten years.

- The Forest considered the above alternatives but dismissed them from further discussion because USFWS recommended that all known Indiana bat caves be addressed, regardless of their location or number of bats they support. Proposed standards are directed at management of MNF lands, they would NOT apply to private lands. However, assigning an OA, or allocating MP 6.3, to NFS lands around privately-owned caves may help the Forest understand the implications of MNF management on Indiana bats that occupy caves on private land and adjust management as appropriate.

9. Change existing standards to address the conservation of species that are not thought to exist on the MNF at this time (such as the Eastern cougar, which at one time inhabited the Forest and for which the Forest currently provides habitat suitable for their reintroduction and recovery).

- Federal agencies are required to comply with provisions of the ESA of 1973, as amended. This includes a requirement to consult with the USFWS on projects that may affect species federally listed as threatened or endangered. In July 1985, consultation was completed for the *Forest Plan* and the USFWS opinion indicated that *Forest Plan* implementation likely would not jeopardize continued existence of Eastern cougar.

The MNF completed the *Revised Biological Assessment* to ensure that management decisions were being made with the most current and state-of-the science information concerning these species. A review of information indicated that, according to WVDNR records, the last confirmed occurrence of Eastern Cougar was 1887. WVDNR and USFWS consider this species extirpated from WV. Although there are a few reports of cougar on the MNF, these sightings are believed to be either misidentification or captive animals that have escaped or have been released (pers. comm. Stihler and Tolin, 2000). The MNF is in the historic range of the gray wolf but the last confirmed occurrence of this species was in 1900, and it too is considered extirpated from the state (Stihler pers comm, 1999). There is one recent record of gray bat (*Myotis grisescens*) in WV. This record is of only two bats from a winter bat count in Hellhole cave in 1991. At this time, the species is considered accidental in WV (Stihler pers comm, 2000).

Information from past and current research, combined with additional local survey data is refining our knowledge of habitat requirements for these species and their current status on the MNF. The Forest, in collaboration with USFWS, WV DNR, the Northeast Research Station, Universities, and other organizations, continues to conduct surveys and analyze new information regarding the status of species known or suspected to occur on the Forest. Despite extensive surveys throughout WV, particularly in and around the MNF, the status of these species remains unchanged. Additionally, there are no indications that existing standards are inadequate to protect these species should they be discovered to occur on the MNF. If these species are documented to occur on the Forest, or if additional species of the MNF become listed in the

future that are not adequately addressed by *Forest Plan* standards, the *Forest Plan* will be amended again at that time.

- 10. Change existing standards to address the conservation of all sensitive species** (such as those on the Regional Forester Sensitive Species list and those proposed for federal listing). **Increase protective measures for Regional Forester Sensitive Species.**
 - Existing standards are considered adequate to protect sensitive species (*Forest Plan*, p. 87, 2670 (B), 1-3), and changes to these standards are not ripe for decision. Conservation assessments for Regional Forester Sensitive Species are being pursued, as needed, to increase the Forest's understanding of species' habitat needs. Also, conservation strategies are being developed to identify ways of addressing their needs. Once these assessments and strategies are completed, the Forest will assess the adequacy of existing *Forest Plan* standards and guidelines. If needed, the Forest will recommend changes during the *Forest Plan* revision process, which was initiated in 2002. In the meantime, impacts to sensitive species will be evaluated as site-specific projects are proposed. If existing *Forest Plan* standards are found to be inadequate, site-specific mitigation will be implemented to eliminate or minimize project effects to these species.
- 11. Consider an alternative that addresses various steps and levels of monitoring, protection, and enhancement activities for threatened and endangered species.** Monitoring requirements added must be specific, time based, and quantifiable. The necessity for timely evaluation of monitoring data must also be stressed.
 - All action alternatives propose adding standards specific to threatened, endangered, and proposed species, but not necessarily in the detail suggested. Currently, the *Forest Plan* provides monitoring standards for several wildlife species, including three threatened and endangered species; and, even though not specifically identified or required by the *Forest Plan*, the Forest monitors other threatened and endangered species (see MNF's FY 2000 Annual Monitoring Report at fs.fed.us/r9/mnf/environmental/environmental_index.htm). The USFWS has concurred that existing *Forest Plan* direction for monitoring is sufficient for the protection of threatened and endangered species, except for the Indiana bat, for which changes are proposed in this assessment.
- 12. Remove threatened, endangered, and proposed protections on the entire MNF.**
 - This alternative would be inconsistent with the Endangered Species Act, National Forest Management Act, and Forest Service policy.
- 13. Do not add, delete, or modify standards for any threatened or endangered species except those required to protect and manage the Indiana bat and WV northern flying squirrel.**
 - Although proposed changes in Cheat Mountain salamander, VA big-eared bat, and threatened and endangered plants' standards are not necessary to comply with the ESA, the Forest felt it would be helpful to make changes that would clarify the Forest's responsibilities for these species, clarify existing standards, and incorporate into the *Forest Plan* management and/or mitigations that have been implemented at the project level.
- 14. Develop management strategies for threatened, endangered, and proposed species and reference them in the *Forest Plan* instead of changing the areas to be managed for Indiana bat and WV northern flying squirrel or creating a separate MP for the primary range of Indiana bats.**
 - It may be desirable to consider such an alternative during *Forest Plan* revision. However, the interdisciplinary team recommended, and the Responsible Official agreed, that the proposed Threatened and Endangered Species Amendment to the *Forest Plan* should be as consistent as possible with existing *Forest Plan* direction to minimize the potential for substantial changes to

commitments made during the 1980s planning process. Currently, the *Forest Plan* directs that OAs be identified for threatened and endangered bats and WV northern flying squirrels; therefore, the approach proposed in this amendment would be more consistent with existing *Forest Plan* direction than if OAs were not identified and only management strategies were referenced in the *Forest Plan*.

15. Do not add, delete, or modify standards for the Indiana bat and WV northern flying squirrel.

- As noted in the Purpose and Need section of Chapter I, the MNF must update standards for the WV northern flying squirrel to meet its ESA responsibilities and be consistent with the *Appalachian Northern Flying Squirrel's Recovery Plan (Updated)*. It also must update standards for the Indiana bat to meet its ESA responsibilities and be consistent with the "Terms and Conditions" that implement the USFWS's "Reasonable and Prudent Measures."

16. Develop management strategies for each hibernaculum on the Forest rather than identifying a separate MP 6.3 area.

- This would require a project level decision, which is beyond the scope of the programmatic decision to be made. Additional, site-specific information is needed before specific strategies for each hibernaculum can be finalized for the thousands of acres of Indiana bat habitat that exists on the MNF. Identifying MP 6.3 areas and associated standards and strengthening existing OA standards for the Indiana bat would allow the Forest to manage Indiana bat habitat until such information can be collected.

17. Implement the Proposed Action as outlined in February 2001 instead of adding standards that provide more specific guidance for threatened and endangered species management.

- Pursuing the February 2001 Proposed Action as written would not fully address the comments received from the public or explain the "Terms and Conditions" that were provided by the USFWS in their March 2002 *Biological Opinion*. Therefore, the Forest chose to add standards to the original Proposed Action that would provide more guidance for threatened and endangered species management.