

DECISION NOTICE
AND
FINDING OF NO SIGNIFICANT IMPACT

For

**Amending the Nantahala and Pisgah
Land and Resources Management Plan –**

**Changing the List of Management Indicator Species, the Species
Groups to be Monitored, and Associated Changes to Forest Plan
Direction**

June, 2005

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1. INTRODUCTION

This Decision Notice (DN) and Finding of No Significant Impact (FONSI) documents my decision Amending the Nantahala and Pisgah Land and Resources Management Plan (Forest Plan or the Plan) and changing the list of management indicator species (MIS), the list of species groups to be monitored as a part of the overall Forest monitoring plan, and associated changes to Forest Plan direction.

I have reviewed the Environmental Assessment (EA) for this plan amendment. I have considered the comments received during scoping. I have given serious thought to and weighed the potential tradeoffs from the alternatives to come to a reasoned choice for how to proceed.

2.0 DECISION

It is my decision to select Alternative 3. This will amend the Forest Plan as described below:

CHANGES TO THE MIS LIST, SPECIES GROUP MONITORING, AND ASSOCIATED PLAN DIRECTION

Alternative 3 has 18 MIS and 9 species groups to be monitored. The 18 MIS include 2 mammals, 6 birds, 4 plants, and 6 fish. The species groups include 5 animal species groups and 4 plant species groups.

Alternative 3 is described in detail below:

PREVIOUS PLAN LANGUAGE	NEW PLAN LANGUAGE (Alt. 3)
<p>From page III-22, Botanical, Wildlife, and Fish Resource Management:</p> <p><u>General Direction:</u> “1. Use Management Indicator Species (MIS) for monitoring populations and habitat conditions for all existing native vertebrates (see Chapter III of the accompanying EIS for a list of species).</p> <p><u>Standard:</u> “a. Use additional MIS for project level analysis as necessary in order to respond to specific issuers or concerns.”</p>	<p><u>General Direction:</u> “1. Use the following Management Indicator Species (MIS) to help indicate effects of plan implementation on fish and wildlife resources:</p> <p>Mammals: Black bear, white-tailed deer Birds: Pileated woodpecker, ovenbird, rufous-sided towhee, pine warbler, acadian flycatcher, ruffed grouse Fish: Wild brook trout, wild brown trout, wild rainbow trout, blacknose dace, smallmouth bass, largemouth bass Plants: Ginseng, ramps, Fraser fir, Carolina hemlock.”</p> <p><u>Standard:</u> “Select MIS from the forest-wide MIS list for use in project-level analysis as appropriate to help indicate project effects on fish and wildlife resources.”</p>

PREVIOUS PLAN LANGUAGE	NEW PLAN LANGUAGE (Alt. 3)
<p>From page III-23, Botanical, Wildlife, and Fish Resource Management (continued)</p> <p><u>General Direction:</u> “3. Maintain viable populations of existing native and desired non-native vertebrate species in the planning area. Protect the following community types when identified as unique in the botanical or wildlife analysis; caves and rare plant communities including bogs, rock cliffs, granitic domes, high elevation rocky summits, barrens and glades, balds, boulder field forests and seeps (Refer to the Supplemental EIS, Appendix L for descriptions of these communities).</p>	<p><u>General Direction:</u> “3. Maintain viable populations of existing native and desired non-native vertebrate species in the planning area. Protect the following community types when identified as unique in the botanical or wildlife analysis; caves and rare plant communities including bogs, rock cliffs, rock outcrops, granitic domes, high elevation rocky summits, barrens and glades, balds, boulder field forests and seeps (Refer to the Supplemental EIS, Appendix L for descriptions of these communities).</p>
<p>From page IV-6: Direction” Use Management Indicator Species (MIS) for monitoring populations and habitat conditions</p>	<p>Direction: Use Management Indicator Species (MIS) to help indicate effects of plan implementation on fish and wildlife resources:</p>
<p>From page D-2: Monitor Management Indicator Species populations and habitat.</p>	<p>Monitor management indicator species to help indicate effects of plan implementation on fish and wildlife resources.</p>
<p>From D-7: Over the next five years, a system of permanent points will be established representing all land type associations on the Pisgah and Nantahala National Forests. These permanent points will be used to survey for the following plants and animals: Breeding birds (including cowbirds) Salamanders Aquatic invertebrates Invasive exotic plants Rich cove plants</p> <p>The following species will be monitored bait station or game data: Black bear Eastern wild turkey White-tailed deer</p> <p>Species and habitat components may be added or subtracted from this list as the system is established and feasibility questions are answered. Any changed to this list will be described in the Annual Monitoring and Evaluation Report.</p>	<p>*See replacement Table D-3 below.</p>
	<p>**Add Table D-4 below.</p>

Table D-3. Species groups to be monitored (NOT MIS):

SPECIES GROUP	MONITORING METHOD	WHY MONITORED
Aquatic Invertebrates	Stream surveys	To evaluate stream health and diversity
Freshwater Mussels	Stream surveys	To detect the presence of several Threatened, Endangered, and Sensitive mussel species
Breeding Birds	Point counts (sight & sound)	As a part of the Region 8 landbird conservation strategy
Bats	Mist netting and/or Anabat (sound detection)	To detect presence of Threatened, Endangered, and Sensitive species and evaluate diversity
Rich Cove Plants	Surveys	To evaluate species diversity, habitat relationships, and forestwide distribution
Non-native Invasive Plants	Transects	Some invasives are a threat to native species
Salamanders	Surveys	To evaluate species diversity, habitat relationships, and forestwide distribution
Pine-Oak Heath	Surveys	To evaluate changes to community composition and structure
Oak Plant Communities	Surveys	To evaluate changes to community composition and structure

Table D-4. Management Indicator Species:

INDICATOR	REASONS FOR SELECTION
Black bear	Helps indicate the effects of management on old forest communities, hard mast, and large contiguous forest areas with low levels of human disturbance.
White-tailed deer	Helps indicate the effects of management on permanent grass/forb habitat, and ability of national forests to provide public hunting opportunities.
Pileated woodpecker	Helps indicate the effects of management on abundance of snags.
Ovenbird	Helps indicate the effects of management on species associated with large areas of contiguous mature deciduous forest.
Rufous-Sided (Eastern) Towhee	Helps indicate the effectiveness of management at maintaining early successional (0-10 years) habitat .
Pine warbler	Helps indicate the effects of management on species associated with xeric yellow pine forests.
Acadian flycatcher	Helps indicate the effects of management on species associated with riparian forests.
Ruffed grouse	Helps indicate the effects of management on species associated with early successional habitat (11-20 years), soft mast producing species, and ability of national forests to provide public hunting opportunities.
Wild brook trout	Helps indicate the effects of management on a portion of coldwater streams, and ability of national forests to provide public fishing opportunities.
Wild brown trout	Helps indicate the effects of management on a portion of coldwater streams, and ability of national forests to provide public fishing opportunities.
Wild rainbow trout	Helps indicate the effects of management on a portion of coldwater streams, and ability of national forests to provide public fishing opportunities.

Table D-4. Management Indicator Species (continued):

INDICATOR	REASONS FOR SELECTION
Blacknose dace	Helps indicate the effects of management on species associated with lower trophic levels of cold water streams.
Smallmouth bass	Helps indicate the effects of management on lower-elevation, warmwater stream communities.
Largemouth bass	Helps indicate the health of reservoir fisheries, and ability of national forests to provide public fishing opportunities.
Ginseng	Helps indicate effectiveness of management at maintaining mixed mesophytic plant communities, i.e. Rich Coves, and for maintaining sustainable ginseng harvests.
Ramps	Helps indicate the effects of management on northern hardwood forests communities.
Fraser fir	Helps indicate effectiveness of management at maintaining fir-dominated communities at high elevations.
Carolina hemlock	Helps indicate effectiveness of management at maintaining Carolina hemlock communities.

3.0 REASONS FOR MY DECISION

In 1994, many units within the Forest Service were expanding their lists of MIS, expecting to use them for various illustrative purposes outside the literal requirements of the regulations. Forest Plan Amendment 5 (1994) incorporated this thinking and expanded the Forests' MIS list from 20 species to 63 species plus 7 species assemblages. This approach proved problematic. Critical scientific review has identified limits to the application and usefulness of the MIS concept. For example: there are often only loose relationships between indicator species populations and habitat quality; effects to indicator species may have limited value in predicting effects to other species; and tracking forest structural features as indicators may provide more meaningful information than tracking indicator species. In addition to these scientific criticisms, recent court rulings have refined our understanding of legal requirements related to MIS. This legal clarification adds to the need to take a hard look at the species selected as MIS.

After over a decade of implementing the MIS list developed in conjunction with Forest Plan Amendment 5, this lengthy list of MIS has not served to provide additional information to forest managers commensurate with the analysis effort required by MIS regulatory requirements. Due to the required documentation, having several MIS for the same habitat is an inefficient use of valuable and limited human resource assets. There is a need to streamline the MIS list for the Nantahala and Pisgah National Forests for the following reasons:

- To reduce redundancy. Some MIS are redundant in that several MIS are representing identical communities and habitats. This redundancy is using limited resources for analysis activities that are not providing substantial additional information on effects to communities and habitats.
- To select species that better represent a specific habitat. Species that are habitat generalists may not make good representatives for specific habitats when a more habitat-specific species can be selected.

- To remove from the list MIS whose population trends cannot be tied to management. For some species, population trends are difficult to establish, and population fluctuations are due to a combination of factors and events, many of which may be unrelated to national forest management.
- To increase the efficacy of the MIS list by removing species associated with protected special habitats. Forest Plan direction and standards provide protection for several “special habitats” such as balds, bogs, rock cliffs, and others. In these cases, MIS serve no useful purpose for analyzing the effects of management.
- To remove from the list MIS that are actually multi-species assemblages and therefore inappropriate as MIS. Multi-species assemblages, or “species groups” are more appropriately utilized for monitoring purposes separately from MIS legal requirements.

Species group monitoring, which is separate from MIS requirements, is a way to evaluate what’s happening with whole groups of plants and animals. In addition to changing the MIS list, this amendment would place more emphasis on species group monitoring, which is an approach I expect to provide additional meaningful information in the long run.

I have considered the tradeoffs associated with any possible loss of species-by-species information. As a decision-maker, I am most concerned with impacts of our actions on forest communities. These impacts can be analyzed without need of analyzing effects to any particular individual species such as a MIS. I am also very concerned with any impacts to Threatened, Endangered, or Sensitive species, and these are analyzed in every project environmental assessment, regardless of MIS status. Separate analysis for several individual species occupying the same habitat or using the same habitat components is not providing more or better information upon which to base a decision – it is basically providing very similar information repeated over and over again and is therefore redundant. It makes our environmental analyses more voluminous but not more insightful.

4.0 SCOPING, PUBLIC INVOLVEMENT, AND PUBLIC COMMENTS

After initial internal scoping, USDI Fish and Wildlife Service, North Carolina Wildlife Resources Commission, and North Carolina Division of Environment and Natural Resources personnel were contacted in regard to this amendment beginning in late November 2004 and continuing through January 2005. Following this, a scoping letter was mailed to approximately 300 individuals and organizations on the Nantahala/Pisgah Forest Plan mailing list in late January 2005. The letter was also posted on the National Forests in North Carolina website. A legal notice was published in the newspaper of record, the Asheville Citizen-Times, on February 1, 2005. The scoping letter had offered interested parties an opportunity to meet and discuss the amendment, and on February 10,

2005, Forest Service personnel met with representatives of four organizations. Telephone contact was made with several other interested parties.

Ten scoping comments were received from individuals and organizations, including other agencies. Numerous comments questioned the selection of one species versus another, questioned whether the list of species retained would be adequate, or had other concerns. All these comments were summarized and responded to individually in Appendix C of the EA – Response to Scoping Comments.

From the scoping comments two significant issues were identified: lack of consistency in the retention or non-retention of species, and concern with the oak plant communities. In response to the significant issues Alternative 3 was developed – which I have selected to implement. A letter with this alternative, summarized comments, and responses was sent to the ten respondents in late April 2005. The letter also offered additional opportunity to meet and discuss the amendment. Follow-up phone calls were made to make commenters aware of our additional alternative and ensure we had accurately captured their concerns. Based on these discussions, I determined the issues and concerns had been adequately described and addressed.

5.0 ALTERNATIVES CONSIDERED

A total of three alternatives were analyzed in detail. Alternative 3 as described in section 2.1 in the EA is the alternative selected for implementation. Alternatives 1 and 2 are briefly described below, along with my rationale for not selecting them.

Alternative 1 – No Action: This alternative proposed no change to the MIS list or species group monitoring.

Rationale for Not Selecting This Alternative: Leaving the MIS list with 63 species and 7 multi-species assemblages is simply unacceptable from the standpoint of efficient use of resources. Selecting this alternative leaves us with inappropriate indicators and unnecessary redundancy. It does not meet the propose and need for the proposal as described in the EA.

Alternative 2: This was the proposed action as scoped. It reduced the list of MIS to 18 species and called for monitoring 7 species groups.

Rationale for Not Selecting This Alternative: While Alternative 2 does meet the purpose and need for the proposal, there exists a level of redundancy and inconsistency among the retained MIS somewhat higher than in Alternative 3 (see Table 2.2 – Comparison of Alternatives in the EA). In addition, red oak, while an important species for many reasons and retained as an MIS in Alternative 2, may not entirely serve the

purposes of MIS. The oak plant community monitoring included in the selected alternative (Alt. 3) may be a more meaningful approach for providing managers useful information.

6.0 FINDINGS REQUIRED BY LAWS AND REGULATIONS

1. This amendment does not change any Forest Plan goals, objectives, desired conditions, management prescriptions, land allocation, timber suitability, or type or amount of outputs of good or services provided. In particular, it does not change the habitat objectives for maintaining viable populations as identified in the Final Supplement to the Final Environmental Impact Statement (Volume II) for Forest Plan Amendment 5. The scope of this decision is limited to adding or deleting management indicator species, adding species groups to be monitored, and associated wording changes in the Forest Plan. Neither the timing of this decision, the location, nor size of the area affected are grounds for considering this to be a significant amendment, since this amendment has no impact to forest resources. Therefore, this would not be a significant amendment to the Forest Plan (EA Chapter III pg. 40).
2. This amendment will meet all requirements of the Endangered Species Act and all agreements with the State Natural Heritage Program, in that there would be no impacts to Threatened, Endangered, and Sensitive species or critical habitat for these (EA Appendix A).
3. The amendment is reasonable and feasible. Implementation of some new monitoring protocols for the new species groups will be needed; however the Forest has the requisite expertise and access to additional external expertise.
4. There are no irreversible or irretrievable resource commitments (EA Chapter III pg. 19) and no loss of long-term productivity (EA Chapter III, pg. 39) since this is essentially a procedural amendment to the Forest Plan and has no ground disturbing effect.

7.0 FINDING OF NO SIGNIFICANT IMPACT

I have determined that this Plan Amendment is not a major federal action, individually or cumulatively, and will not have a significant impact on the quality of the human environment. Therefore, an environmental impact statement will not be prepared. I have considered both context and intensity in my determination, based on environmental analysis documented in the Environmental Assessment.

CONTEXT

This Plan Amendment changes the list of MIS, changes the list of species groups to be monitored apart from MIS, and makes associated wording changes in Forest Plan direction. The outcomes anticipated from this amendment are: there would be less redundancy in the environmental assessments for projects; and there would be changes in the amounts and types of field data collected for forest-wide monitoring purposes. It would not have direct, indirect, or cumulative effects on any forest resource.

INTENSITY

Both beneficial and adverse impacts are considered. There will be no significant effects as a result of the action (EA Chapter III). The nature of the impacts of this proposal has to do with the availability of certain information, the analysis presented to inform decision makers, and the type of monitoring activities that will occur in the future.

The actions will have no discernible effects on the public health and safety (EA Chapter III, pg. 38). Any activities related to the changes in monitoring will be similar to other forest related outdoor activities such as hiking or nature study.

The actions will not have any detrimental effects on any unique characteristics of the geographic area such as historical and cultural resources, prime farm lands, rangelands, parklands, wetlands, wild and scenic rivers, or ecologically critical areas (EA Chapter III pp. 20-22, & 38).

Based on public involvement and analysis, the effects on the quality of the human environment are not highly controversial (EA pp. 6-8 and Appendix C).

The actions do not involve highly uncertain, unique, or unknown environmental risks to the human environment (EA throughout Chapter III). No direct, indirect, or cumulative effects would occur to any forest resource.

This amendment will change the nature of the analysis of effects in future project environmental assessments, and will change some forest-wide monitoring activities. These changes should provide less redundancy in environmental assessments and should provide additional baseline information for Forest Plan revision.

The cumulative effects of the proposed actions have been analyzed and no significant effects are anticipated (EA pp. 19, 20, 22, 27, 33, 36, 38).

This action does not adversely affect cultural resources listed or eligible for listing in the National Register of Historic Places and will not cause loss or destruction of significant scientific, cultural, or historical resources (EA pg. 38).

This amendment will have “no effect” on Threatened or Endangered Species and “no impacts” on Sensitive Species. The amendment will not result in a trend to federal listing or cause a loss of viability of any Sensitive species (EA Appendix A).

This action does not threaten to lead to violation of federal, state, or local laws imposed for the protection of the environment, since there will be no direct, indirect, or cumulative effects on any natural resource.

8.0 APPEAL RIGHTS

This decision is subject to appeal pursuant to 36 CFR 217. Any appeal of this decision must be fully consistent with 36 CFR 217.9, “Content of a notice of appeal.” Written appeals, including attachments, should be sent to USDA Forest Service, Southern Region, ATTN: Appeals Deciding Officer, 1720 Peachtree Road, N.W., Suite 811 N, Atlanta, Georgia 30309-9102. Appeals must be postmarked or received within 45 days after the date this notice is published in *The Asheville Citizen-Times*. Appeals may be faxed to (404) 347-5401. Hand-delivered appeals must be received within normal business hours of 8:00 a.m. to 4:30 p.m. Appeals may also be mailed electronically in a common digital format to appeals-southern-regional-office@fs.fed.us.

For further information on this decision, contact Ruth Berner, Forest Planner, as (828) 257-4862.

9.0 EFFECTIVE DATE

Amendment 17 will become effective on October 1, 2005.

JOHN F. RAMEY
Forest Supervisor
National Forests in North Carolina

Date



United States
Department of
Agriculture

Forest
Service

June, 2005



Environmental Assessment

**Amending the Nantahala and Pisgah
Land and Resources Management Plan –**

**Changing the List of Management
Indicator Species, Changing the List of
Species Groups to be Monitored, and
Associated Forest Plan Direction**

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ABSTRACT:

In January 2005, the National Forests in North Carolina proposed to amend the Land and Resource Management Plan for the Nantahala and Pisgah National Forests to change the current list of management indicator species (MIS) and the list of species groups to be monitored as a part of the overall Forest Monitoring Plan. The proposed amendment would streamline the MIS list to 2 mammals, 7 birds, 5 plants, and 4 fish. Eight species groups would be listed for monitoring separately from the MIS requirements. "Rock outcrops" would be added to the list of special habitats in Nantahala/Pisgah Forest Plan Amendment 5.

Two alternatives to the proposed action are considered. Alternative 1 – no action – would keep the MIS list as it is and not make the other Forest Plan changes. Alternative 3 – developed in response to scoping – would delete one bird and one plant MIS, list 6 fish MIS, and add the species group "oak plant communities" to the species group monitoring.

No alternative has any effect on the species population trends or other aspects of the environment, since this amendment simply changes the MIS list and the monitoring requirements in the plan.

CHAPTER 1 – PURPOSE AND NEED

1.1 Proposed Action

In January 2005, the National Forests in North Carolina (NFsNC) proposed to amend the Land and Resource Management Plan (“Forest Plan”) for the Nantahala and Pisgah National Forests (“the Forests”) to change the current list of management indicator species (MIS) and change the list of species groups (separate from MIS) to be monitored. The original Forest Plan published in 1987 contained 5 mammals, 6 birds, 5 fish, 3 plants, and one invertebrate as MIS. The list of MIS was modified and expanded for Forest Plan Amendment 5 (1994) to 8 mammals, 17 birds, 11 fish, 4 amphibians, 23 plants, and 7 multi-species assemblages. Since that time, the effectiveness of these MIS has been reviewed, and it has been determined that the list needs to be updated again. The proposed amendment would streamline the list to 2 mammals, 7 birds, 5 plants, and 4 fish. In addition, eight species groups would be monitored, not as MIS, but as a part of the overall Forest Plan monitoring plan. Minor modifications to the language in the Forest Plan would be made to: 1) change the language related to MIS on pages III-22, IV-6 and D-2; 2) add “rock outcrops” to the list of community types to be protected on page III-23; modify Table D-3 to include additional species groups; and add Table D-4 [See details in Chapter 2, Alternative 2.]

1.2 Purpose and Need for the Proposed Action

MIS were established during the development of the Forest Plan in compliance with the 1982 planning regulations (36 C.F.R. 219.19). These regulations require that certain species be selected “in order to estimate the effects of each alternative on fish and wildlife populations....” Further, “these species shall be selected because their population changes are believed to indicate the effects of management activities.” Each Forest Plan alternative also had to establish objectives for the maintenance and improvement of habitat for the MIS.

After almost a decade of implementing the Forest Plan with the current MIS list, there is a need to amend the MIS for the Nantahala and Pisgah National Forests for the following reasons:

- To reduce redundancy. Some MIS are redundant in that several MIS are representing identical communities and habitats. This redundancy is using limited resources for analysis activities that are not providing substantial additional information on effects to communities and habitats.
- To select species that better represent a specific habitat. Species that are habitat generalists may not make good representatives for specific habitats when a more habitat-specific species can be selected.
- To remove from the list MIS whose population trends cannot be tied to management. For some species, population trends are difficult to establish, and population fluctuations are due to a combination of factors and events, many of which may be unrelated to national forest management.
- To increase the efficacy of the MIS list by removing species associated with protected special habitats. Forest Plan direction and standards provide protection

- for several “special habitats” such as balds, bogs, rock cliffs, and others. In these cases, MIS serve no useful purpose for analyzing the effects of management.
- To remove from the list MIS that are actually multi-species assemblages and therefore inappropriate as MIS. Multi-species assemblages, or “species groups” are more appropriately utilized for monitoring purposes separately from MIS legal requirements.

By the time of Forest Plan Amendment 5 in 1994 many units within the Forest Service were expanding their lists of MIS, expecting to use them for various illustrative purposes outside the literal requirements of the regulations. Amendment 5 incorporated this thinking and expanded the Forests’ MIS list from 20 species to 63 species plus 7 species assemblages. This approach proved problematic. Critical scientific review has identified limits to the application and usefulness of the MIS concept (Andelman and Fagan 2000, Hannon and McCallum 2003). For example: there are often only loose relationships between indicator species populations and habitat quality; effects to indicator species may have limited value in predicting effects to other species; and tracking forest structural features as indicators may provide more meaningful information than tracking indicator species. In addition to these scientific criticisms, recent court rulings have refined our understanding of legal requirements related to MIS. This legal clarification adds to the need to take a hard look at the species selected as MIS.

Because our plan was developed under the 1982 regulations, MIS requirements still apply. When our Forest Plan is revised (currently scheduled to be started in the fall of 2007) we will incorporate the current regulatory language that does not use the MIS concept. Given this timing, Plan revision would not resolve the MIS situation for another five years. Based on the limited usefulness of MIS, the limited resources we have to devote to monitoring, and the length of time until the Plan is revised, streamlining our MIS list now is the most prudent course of action.

1.3 Decision To Be Made

The decision to be made is whether to amend the Forest Plan by selecting the Proposed Action or an alternative. The scope of the decision is limited to adding or deleting management indicator species and editing associated Forest Plan direction, adding to the list of protected special habitats, and modifying the list of species groups to be monitored outside the MIS framework.

1.4 Public Involvement

USDI Fish and Wildlife Service, North Carolina Wildlife Resources Commission, and North Carolina Division of Environment and Natural Resources personnel were contacted in regard to this amendment beginning in late November 2004 and continuing through January 2005. A scoping letter was mailed to approximately 300 individuals and organizations on the Nantahala/Pisgah Forest Plan mailing list in late January 2005. The letter was also posted on the National Forests in North Carolina website. A legal notice was published in the newspaper of record, the Asheville Citizen-Times, on February 1,

2005. The scoping letter had offered interested parties an opportunity to meet and discuss the amendment, and on February 10, 2005, Forest Service personnel met with representatives of four organizations – Southern Environmental Law Center, Southern Appalachian Biodiversity Project, Western North Carolina Alliance, and Southern Appalachian Forest Coalition. Telephone contact was made with several other interested parties.

Ten scoping comments were received from individuals and organizations, including other agencies. All the comments received were summarized and a written response formulated. In response to comments another alternative was developed - Alternative 3. A letter with this alternative, summarized comments, and responses was sent to the ten respondents in late April 2005. The letter also offered additional opportunity to meet and discuss the amendment. Follow-up phone calls were made to make commenters aware of our additional alternative and ensure we had accurately captured their concerns.

1.5 Significant Issues Related to the Proposed Action

1. Lack of consistency in the retention or non-retention of species,
2. Concern with the oak plant communities.

In response to these issues we developed Alternative 3. Alternative 3 modifies Alternative 2 to address these issues as follows:

- To be consistent with the logic that species groups are not appropriate as MIS, the “wild trout” MIS would be replaced by breaking out the three wild trout species separately: wild brook trout, wild brown trout, and wild rainbow trout (the “wild designator is to distinguish from stocked trout).
- To be consistent with the desire to eliminate redundancy, eastern wild turkey would be eliminated from the MIS list. It is an indicator for hard mast, grass/forb openings, and a demand species. Black bear is also a retained indicator for hard mast, and white-tailed deer is also a retained indicator for grass/forb openings. Black bear and white-tailed deer are also both demand species and would be retained in Alternative 3 in lieu of wild turkey. Wild turkey, however, remains a species emphasized in our wildlife management activities. We will continue our partnerships to provide wild turkey habitat improvements to support the population.
- To address the concern for oak communities, red oak would be eliminated from the MIS list and “oak plant communities” would be added to the Monitoring Plan Table D-3 – Species Group Monitoring. This approach would be more meaningful since there is no general agreement on which single oak species is most appropriate to include on the MIS list.

1.6 Other Issues

Numerous comments questioned the selection of one species versus another, questioned whether the list of species retained would be adequate, or had other concerns. All these

comments have been summarized and responded to individually by: 1) providing explanatory information and/or elaborating on the logic of our selection, or 2) suggesting an alternative approach to addressing the concern outside this amendment process. See Appendix C – Response to Scoping Comments.

CHAPTER 2 - ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 Alternatives Considered in Detail

Alternative 1: No Action

The No Action Alternative would retain the current list of 63 species and 7 species groups as MIS. Rock outcrops would not be added to the list of protected special habitats. Amendment 5 Table D-3 would not be modified, and related Plan direction would remain unchanged. The current MIS and their associated habitats are shown in Table 2-1. The current Plan language is shown in the description of Alternative 2, side-by-side with the proposed new language.

Table 2-1. Current list of MIS and associated habitat components

Species	Habitat Components Represented
Black Bear	Old Forest Communities, Hard mast-producing species, Mixed Pine/hardwood forest types, Contiguous forest areas with low disturbance, Den trees (>36 dbh), Downed woody debris- all sizes
Carolina northern Flying Squirrel	Fraser Fir Forests, Red Spruce/Fraser fir, Northern hardwood forests
White Tailed Deer	Early-successional (0-10), Hard mast- producing species, Mixed pine/hardwood forest types
Raccoon	Alluvial Forests, Snags and dens (>22 dbh)
Rabbit	Early successional (0-10), Permanent grass/forb openings
Gray Squirrel	Hard mast-producing species , Mixed pine/hardwood forest types, Small snags and dens
Bobcat	Early successional (0-10)
Mink	Alluvial Forests
Bats	Caves, Old Forest Communities
Pileated Woodpecker	Old Forest Communities, Snags and dens (>22 dbh), Downed woody debris – all sizes
Golden Crowned Kinglet	Fraser Fir Forests, Red Spruce/Fraser Fir Forests, Carolina Hemlock bluff forests
Veery	Large Contiguous Forest Areas
Solitary (Blue headed) Vireo	Red Spruce/Fraser fir Forests, Northern Hardwood Forests, Cove Forests, Large Contiguous forests
Northern Parula Warbler	Large Contiguous Forest Areas
Ovenbird	Large Contiguous Forest Areas
Yellow-Bellied Sapsucker	Small snags and dens
Rufous-Sided (Eastern) Towhee	Early-successional (0-10), Early successional (11-20)
White-breasted Nuthatch	Small snags and dens
Cedar Waxwing	Soft mast-producing species
Pine Warbler	Yellow pine mid-successional forests
Raven	Open rock outcrops and cliffs
Field Sparrow	Early successional (0-10)

Species	Habitat Components Represented
Eastern Wild Turkey	Hard mast-producing species, Mixed pine/hardwood forest types, Contiguous forest areas with moderate disturbance, Permanent grass/forb openings
Ruffed Grouse	Early successional (0-10), Early successional (11-20), Downed woody debris
Peregrine Falcon	Open rock outcrops and cliffs
Eastern Meadowlark	Permanent grass/forb openings
Green Salamander	Shaded rock outcrops and cliffs
Jordan's Salamander	Shaded rock outcrops and cliffs
Spotted Salamander	Mountain ponds and ephemeral pools
Blue Ridge two-lined salamander	Alluvial Forests
Brook, Brown and Rainbow Trout, sculpin	Coldwater streams
Largemouth Bass, Bluegill	Reservoirs
Blacknose Dace	Coldwater streams
Freshwater mussels	Warmwater streams
Smallmouth Bass, white/redhorse suckers	Coolwater streams, Warmwater streams
Spotfin Chub	Warmwater streams
Aquatic Invertebrates	Streams
Index of Biotic Integrity	Streams
Red Oak	Oak and oak/hickory forests
White Oak	Oak and oak/hickory forests
Buckeye	Cove forests
Basswood	Cove forests
Black Cherry	Cove Forests
Hickory (All Species)	Oak and oak/hickory forests
White Pine	White Pine forests
Pitch and Table Mountain Pine, turkey beard	Xeric yellow pine forests
Fraser Fir	Spruce-Fir forests
Carolina hemlock	Carolina hemlock bluffs
Ginseng	Coves
Mountain oat-grass	Grassy balds and open rock outcrops
Catawba rhododendron	Heath balds
Golden saxifrage, umbrella leaf, mountain lettuce	Forested seep wetlands
Prairie dropseed, slender wheatgrass	Barrens and glades
Alumroot, saxifrage	Shaded rock outcrops
Biltmore sedge, wretched sedge	Open rock outcrops
Sphagnum spp.	Mountain bogs
Twisted stalk	Northern hardwood forests
Lung lichen	Old forest communities
Grapes	Soft mast producing species
Non-native invasive plants	N.A. – represents a potential threat to all communities

Alternative 2: Proposed Action

Alternative 2 has 18 MIS and 8 species groups to be monitored. The 18 MIS include 2 mammals, 7 birds, 5 plants, and 4 fish. The species groups include 5 animal species groups and 3 plant species groups.

The following changes would be made to the Nantahala/Pisgah Land and Resource Management Plan – Amendment 5:

EXISTING LANGUAGE (Alternative 1)	PROPOSED NEW LANGUAGE (Alt. 2)
<p>From page III-22, Botanical, Wildlife, and Fish Resource Management:</p> <p><u>General Direction:</u> “1. Use Management Indicator Species (MIS) for monitoring populations and habitat conditions for all existing native vertebrates (see Chapter III of the accompanying EIS for a list of species).</p> <p><u>Standard:</u> “a. Use additional MIS for project level analysis as necessary in order to respond to specific issues or concerns.”</p>	<p><u>General Direction:</u> “1. Use the following Management Indicator Species (MIS) to help indicate effects of plan implementation on fish and wildlife resources:</p> <p>Mammals: Black bear, white-tailed deer Birds: Pileated woodpecker, ovenbird, rufous-sided towhee, pine warbler, acadian flycatcher, eastern wild turkey, ruffed grouse Fish: Wild trout, blacknose dace, smallmouth bass, largemouth bass Plants: Red oak, ginseng, ramps, Fraser fir, Carolina hemlock”</p> <p><u>Standard:</u> “Select MIS from the forest-wide MIS list for use in project-level analysis as appropriate to help indicate project effects on fish and wildlife resources.”</p>
<p>From page III-23, Botanical, Wildlife, and Fish Resource Management (continued)</p> <p><u>General Direction:</u> “3. Maintain viable populations of existing native and desired non-native vertebrate species in the planning area. Protect the following community types when identified as unique in the botanical or wildlife analysis; caves and rare plant communities including bogs, rock cliffs, granitic domes, high elevation rocky summits, barrens and glades, balds, boulder field forests and seeps (Refer to the Supplemental EIS, Appendix L for descriptions of these communities).</p>	<p><u>General Direction:</u> “3. Maintain viable populations of existing native and desired non-native vertebrate species in the planning area. Protect the following community types when identified as unique in the botanical or wildlife analysis; caves and rare plant communities including bogs, rock cliffs, rock outcrops, granitic domes, high elevation rocky summits, barrens and glades, balds, boulder field forests and seeps (Refer to the Supplemental EIS, Appendix L for descriptions of these communities).</p>
<p>From page IV-6: Direction” Use Management Indicator Species (MIS) for monitoring populations and habitat conditions</p>	<p>Direction: Use Management Indicator Species MIS to help indicate effects of plan implementation on fish and wildlife resources.</p>
<p>From page D-2: Monitor Management Indicator Species populations and habitat.</p>	<p>Monitor management indicator species to help indicate effects of plan implementation</p>

EXISTING LANGUAGE (Alternative 1)	PROPOSED NEW LANGUAGE (Alt. 2)
	on fish and wildlife resources.
<p>From D-7: Over the next five years, a system of permanent points will be established representing all land type associations on the Pisgah and Nantahala National Forests. These permanent points will be used to survey for the following plants and animals: Breeding birds (including cowbirds) Salamanders Aquatic invertebrates Invasive exotic plants Rich cove plants</p> <p>The following species will be monitored bait station or game data: Black bear Eastern wild turkey White-tailed deer</p> <p>Species and habitat components may be added or subtracted from this list as the system is established and feasibility questions are answered. Any changed to this list will be described in the Annual Monitoring and Evaluation Report.</p>	<p>*See replacement Table D-3 below.</p>
	**Add Table D-4 below.

***Table D-3. Species groups to be monitored (NOT MIS).**

SPECIES GROUP	MONITORING METHOD	WHY MONITORED
Aquatic Invertebrates	Stream surveys	To evaluate stream health and diversity
Freshwater Mussels	Stream surveys	To detect the presence of several Threatened, Endangered, and Sensitive mussel species
Breeding Birds	Point counts (sight & sound)	As a part of the Region 8 landbird conservation strategy
Bats	Mist netting and/or Anabat (sound detection)	To detect presence of Threatened, Endangered, and Sensitive species and evaluate diversity
Rich Cove Plants	Surveys	To evaluate species diversity, habitat relationships, and forestwide distribution
Non-native Invasive Plants	Transects	Some invasives are a threat to native species
Salamanders	Surveys	To evaluate species diversity, habitat relationships, and forestwide distribution
Pine-Oak Heath	Surveys	To evaluate changes to community composition and structure

[NOTE: The “Species groups to be monitored” are **not** MIS.]

****Table D-4. Management Indicator Species**

INDICATOR	REASONS FOR SELECTION
Black bear	Helps indicate the effects of management on old forest communities, hard mast, and large contiguous forest areas with low levels of human disturbance.
White-tailed deer	Helps indicate the effects of management on permanent grass/forb habitat and ability of national forests to provide public hunting opportunities.
Pileated woodpecker	Helps indicate the effects of management on abundance of snags.
Ovenbird	Helps indicate the effects of management on species associated with large areas of contiguous mature deciduous forest.
Rufous-Sided (Eastern) Towhee	Helps indicate the effectiveness of management at maintaining early successional (0-10 years) habitat.
Pine warbler	Helps indicate the effects of management on species associated with xeric yellow pine forests.
Acadian flycatcher	Helps indicate the effects of management on species associated with riparian forests.
Eastern wild turkey	Helps indicate the effects of management on species associated with hard mast or permanent grass/forb openings, and ability of national forests to provide public hunting opportunities.
Ruffed grouse	Helps indicate the effects of management on species associated with early successional habitat (11-20 years), soft mast producing species, and ability of national forests to provide public hunting opportunities.
Wild trout	Helps indicate the effects of management on cold water stream communities and ability of national forests to provide public hunting opportunities.
Blacknose dace	Helps indicate the effects of management on species associated with lower trophic levels of cold water streams.
Smallmouth bass	Helps indicate the effects of management on lower-elevation, warmwater stream communities.
Largemouth bass	Helps indicate the health of reservoir fisheries and ability of national forests to provide public fishing opportunities.
Red oak	Helps indicate effectiveness of management at maintaining Oak-Hickory plant communities and High Elevation Red Oak plant communities.
Ginseng	Helps indicate effectiveness of management at maintaining mixed mesophytic plant communities, i.e. Rich Coves, and for maintaining sustainable ginseng harvests.
Ramps	Helps indicate the effects of management on northern hardwood forests communities.
Fraser fir	Helps indicate effectiveness of management at maintaining fir-dominated communities at high elevations.
Carolina hemlock	Helps indicate effectiveness of management at maintaining Carolina hemlock communities.

Alternative 3: Developed in Response to Significant Issues

Alternative 3 has 18 MIS and 9 species groups to be monitored. The 18 MIS include 2 mammals, 6 birds, 4 plants, and 6 fish. The species groups include 5 animal species groups and 4 plant species groups. This alternative responds to the consistency issue by removing eastern wild turkey and separating out the three wild trout species. Removing eastern wild turkey reduces redundancy in indicators of hard mast-producing species and permanent grass/forb openings. Separating out the “wild trout” listing into its three

component species responds to the consistency issue regarding the avoidance of multi-species groups as MIS. Removing red oak from the MIS list in favor of adding “oak plant communities” to the species groups to be monitored separately from MIS requirements responds to the concern that no single oak is appropriate to represent all oak communities.

Alternative 3 makes the following changes to the Alternative 2 MIS list:

ADD to the Alternative 2 MIS list: wild brook trout, wild brown trout, wild rainbow trout.

ELIMINATE from the Alternative 2 MIS list: wild trout, eastern wild turkey, red oak.

Alternative 3 is described in detail below:

EXISTING LANGUAGE (Alternative 1)	PROPOSED NEW LANGUAGE (Alt. 3)
<p>From page III-22, Botanical, Wildlife, and Fish Resource Management:</p> <p><u>General Direction:</u> “1. Use Management Indicator Species (MIS) for monitoring populations and habitat conditions for all existing native vertebrates (see Chapter III of the accompanying EIS for a list of species).</p> <p><u>Standard:</u> “a. Use additional MIS for project level analysis as necessary in order to respond to specific issuers or concerns.”</p>	<p><u>General Direction:</u> “1. Use the following Management Indicator Species (MIS) to help indicate effects of plan implementation on fish and wildlife resources:</p> <p>Mammals: Black bear, white-tailed deer Birds: Pileated woodpecker, ovenbird, rufous-sided towhee, pine warbler, acadian flycatcher, ruffed grouse Fish: Wild brook trout, wild brown trout, wild rainbow trout, blacknose dace, smallmouth bass, largemouth bass Plants: Ginseng, ramps, Fraser fir, Carolina hemlock”</p> <p><u>Standard:</u> “Select MIS from the forest-wide MIS list for use in project-level analysis as appropriate to help indicate project effects on fish and wildlife resources.”</p>
<p>From page III-23, Botanical, Wildlife, and Fish Resource Management (continued)</p> <p><u>General Direction:</u> “3. Maintain viable populations of existing native and desired non-native vertebrate species in the planning area. Protect the following community types when identified as unique in the botanical or wildlife analysis; caves and rare plant communities including bogs, rock cliffs, granitic domes, high elevation rocky summits, barrens and glades, balds, boulder field forests and seeps (Refer to the Supplemental EIS, Appendix L for</p>	<p><u>General Direction:</u> “3. Maintain viable populations of existing native and desired non-native vertebrate species in the planning area. Protect the following community types when identified as unique in the botanical or wildlife analysis; caves and rare plant communities including bogs, rock cliffs, rock outcrops, granitic domes, high elevation rocky summits, barrens and glades, balds, boulder field forests and seeps (Refer to the Supplemental EIS, Appendix L for descriptions of these</p>

EXISTING LANGUAGE (Alternative 1)	PROPOSED NEW LANGUAGE (Alt. 3)
descriptions of these communities).	communities).
From page IV-6: Direction" Use Management Indicator Species (MIS) for monitoring populations and habitat conditions	Direction: Use Management Indicator Species MIS to help indicate effects of plan implementation on fish and wildlife resources:
From page D-2: Monitor Management Indicator Species populations and habitat.	Monitor management indicator species to help indicate effects of plan implementation on fish and wildlife resources.
<p>From D-7: Over the next five years, a system of permanent points will be established representing all land type associations on the Pisgah and Nantahala National Forests. These permanent points will be used to survey for the following plants and animals: Breeding birds (including cowbirds) Salamanders Aquatic invertebrates Invasive exotic plants Rich cove plants</p> <p>The following species will be monitored bait station or game data: Black bear Eastern wild turkey White-tailed deer</p> <p>Species and habitat components may be added or subtracted from this list as the system is established and feasibility questions are answered. Any changed to this list will be described in the Annual Monitoring and Evaluation Report.</p>	<p>*See replacement Table D-3 below.</p>
	**Add Table D-4 below.

Alternative 3 Table D-3. Species groups to be monitored (NOT MIS):

SPECIES GROUP	MONITORING METHOD	WHY MONITORED
Aquatic Invertebrates	Stream surveys	To evaluate stream health and diversity
Freshwater Mussels	Stream surveys	To detect the presence of several Threatened, Endangered, and Sensitive mussel species
Breeding Birds	Point counts (sight & sound)	As a part of the Region 8 landbird conservation strategy
Bats	Mist netting and/or Anabat (sound detection)	To detect presence of Threatened, Endangered, and Sensitive species and evaluate diversity
Rich Cove Plants	Surveys	To evaluate species diversity, habitat relationships, and forestwide distribution
Non-native Invasive Plants	Transects	Some invasives are a threat to native species
Salamanders	Surveys	To evaluate species diversity, habitat

		relationships, and forestwide distribution
Pine-Oak Heath	Surveys	To evaluate changes to community composition and structure
Oak Plant Communities	Surveys	To evaluate changes to community composition and structure

Alternative 3 Table D-4. Management Indicator Species:

INDICATOR	REASONS FOR SELECTION
Black bear	Helps indicate the effects of management on old forest communities, hard mast, and large contiguous forest areas with low levels of human disturbance.
White-tailed deer	Helps indicate the effects of management on permanent grass/forb habitat, and ability of national forests to provide public hunting opportunities.
Pileated woodpecker	Helps indicate the effects of management on abundance of snags.
Ovenbird	Helps indicate the effects of management on species associated with large areas of contiguous mature deciduous forest.
Rufous-Sided (Eastern) Towhee	Helps indicate the effectiveness of management at maintaining early successional (0-10 years) habitat .
Pine warbler	Helps indicate the effects of management on species associated with xeric yellow pine forests.
Acadian flycatcher	Helps indicate the effects of management on species associated with riparian forests.
Ruffed grouse	Helps indicate the effects of management on species associated with early successional habitat 11-20, soft mast producing species, downed woody debris, and ability of national forests to meet public demand for hunting.
Wild brook trout	Helps indicate the effects of management on a portion of coldwater streams, and ability of national forests to provide public fishing opportunities.
Wild brown trout	Helps indicate the effects of management on a portion of coldwater streams , and ability of national forests to provide public fishing opportunities.
Wild rainbow trout	Helps indicate the effects of management on a portion of coldwater streams, and ability of national forests to provide public hunting opportunities.
Blacknose dace	Helps indicate the effects of management on species associated with lower trophic levels of cold water streams.
Smallmouth bass	Helps indicate the effects of management on lower-elevation, warmwater stream communities.
Largemouth bass	Helps indicate the health of reservoir fisheries and ability of national forests to provide public fishing opportunities.
Ginseng	Helps indicate effectiveness of management at maintaining mixed mesophytic plant communities, i.e. Rich Coves, and for maintaining sustainable ginseng harvests.
Ramps	Helps indicate the effects of management on northern hardwood forests communities.
Fraser fir	Helps indicate effectiveness of management at maintaining fir-dominated communities at high elevations.
Carolina hemlock	Helps indicate effectiveness of management at maintaining Carolina hemlock communities.

2.2 Comparison of Alternatives

Table 2.2 compares how each alternative meets the purpose and need and the significant issues for the proposal.

Table 2.2 Comparison of Alternatives

Comparison Factor	Alternative 1	Alternative 2	Alternative 3
Purpose and Need:			
Reducing redundancy	Contains redundancies for most habitat components. Contains nine terrestrial demand species.	Contains redundancies for a few habitat components (large contiguous forest areas, early successional, grass/forb, hard mast). Contains four terrestrial demand species.	Contains less redundancy than Alternative 2.
Selecting species that better represent a habitat than those in the current MIS list	Not applicable.	Replaces indicators of northern hardwood forests and riparian forests.	Replaces indicators of northern hardwood forests and riparian forests
Removing MIS whose population trends cannot be tied to management.	Contains MIS whose population trends cannot be tied to management.	Removes eastern meadowlark –a species clearly not affected by national forest management.	Removes eastern meadowlark –a species clearly not affected by national forest management.
Removing MIS associated with protected special habitats to improve efficiencies.	Contains indicators of protected special habitats.	Removes all indicators of protected special habitats.	Removes all indicators of protected special habitats.
Removing multi-species assemblages from the list of MIS.	Contains multi-species assemblages as MIS	Retains no multi-species assemblages as MIS except “wild trout.”	Retains no multi-species assemblages as MIS.
Significant Issues:			
Consistency of choices for MIS selected for retention	Not applicable	Some inconsistent selections, i.e., retains some redundancy and a multi-species assemblage.	Retains less inconsistency than Alt. 2 in that it lessens redundancy and lists only individual species.
Adequately addresses oak communities	Contains red oak and white oak as MIS. Oaks not included in species group monitoring.	Contains red oak as MIS. Oaks not included in species group monitoring.	No oak on MIS list; however, “oak plant communities” become one of the “species groups” to be monitored separately from MIS requirements.

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CHAPTER 3 - ENVIRONMENTAL CONSEQUENCES

The proposed amendment to the Forest Plan evaluated in this environmental assessment represents an administrative decision that produces no direct, indirect, or cumulative environmental effects on the forest resources and entails no irreversible or irretrievable commitments of resources on any site. This amendment would make changes to the list of MIS available for use in analyzing the effects of alternatives presented in future project-level environmental assessments or environmental impact statements. This amendment would also make changes to the Monitoring Plan for the Nantahala and Pisgah National Forests by changing the MIS list, changing the list of species groups to be monitored, and making related wording changes in the text of Forest Plan direction. The nature of the impacts of this proposal has to do with the availability of certain information, the analysis presented to inform decision makers, and the type of monitoring activities that would occur in the future.

3.1 Biological Resources

Neither retention of the current MIS list (Alternative 1) nor shortening the list (Alternatives 2 & 3) would have any direct, indirect, or cumulative effect to any MIS species population trends, trends in their associated habitat, or any other biological resource since changing the list does not affect conditions in the forest. Changing the species selected to indicate the effects of management on a particular community has no effect on the community itself. Neither would retention of the current list of species groups to be monitored apart from the MIS (Alt. 1) or adding to that list (Alts. 2 & 3) have any effect on the species groups being monitored or any other biological resource. For terrestrial species groups and aquatic vertebrates, species would be field identified and would not be removed from their habitat. Aquatic invertebrates typically *are* removed from the field for identification; however, this does not substantively impact aquatic invertebrate populations since they exist in such high numbers, and monitoring removes comparatively tiny numbers of individuals from minute portions of waterbodies. Changing these lists *would* affect data collection and analyses that feed into the Forest planning process, the monitoring and evaluation reports, and project environmental assessments. For example, if a species is dropped from the MIS list, population trend information for that species would likely not be included in the annual monitoring and evaluation report. Likewise, population trend information for that species would not be needed for project environmental analysis. For another example, monitoring additional species groups would likely increase the baseline information available for Forest Plan amendments and revisions.

Further evaluation of environmental consequences is presented in this section organized by broad categories of species and their functions.

Effects to Rare Plant Communities and Special Habitats: grassy balds, health balds, forested seep wetlands, mountain bogs, mountain ponds and ephemeral pools, barrens and glades, shaded rock outcrops, open rock outcrops, cliffs, caves, and white pine forests.

Alternative 1 (no action) retains one or more MIS for each of the rare plant communities and special habitats listed above. Alternatives 2 and 3 do not retain the MIS associated with these. The reasoning is that since Forest Plan direction is to *protect* special habitats, that tracking individual MIS is not necessary and is inefficient. Protection can take many forms, for example: closure orders restricting access to sites such as some rock cliffs; avoidance, i.e., marking protected areas such as wetlands to avoid during management activities; active restoration such as using prescribed fire to restore barrens or grazing to restore balds; barriers or physical devices such as bars across cave entrances. The intent of protection is to maintain the physical conditions that support the whole biological community of the special habitat.

Neither retaining (Alternative 1) nor eliminating (Alternatives 2 & 3) MIS associated with rare plant communities and unique habitats would affect the level of protection or monitoring for these communities. No alternative would directly, indirectly, or cumulatively affect either the communities themselves or the environment in general.

Rare plant communities are important components of the biodiversity of the Nantahala and Pisgah National Forests. With the help of conservation partners, much of the Forests has been surveyed to locate and describe these unique plant communities. When they are found, they are mapped and protected. Many of these communities provide habitat for sensitive and/or federally listed species, the presence of which provides extra protection and monitoring for these communities. Surveys for these habitats are conducted prior to any management activities and none of the alternatives considered would change this. When found, these special communities' locations are then reported to the N.C. Natural Heritage Program for inclusion in their database. Removing from the MIS list species associated with the above-listed rare plant communities and unique habitats (as Alternatives 2 and 3 would do) would result in no loss of information and does not imply that these communities and the species that they support are no longer of interest or importance. The Forest Service, in partnership with the state Natural Heritage Program, and other agencies and organizations, will continue to monitor and conserve these special communities on the Nantahala and Pisgah National Forests.

Many of the important sites that support rare plant communities and other unique habitats on the Nantahala and Pisgah National Forests are assigned to their own Management Area (MA 13) and are protected by Forest Plan direction that govern activities there. Some additional sites are protected by inclusion in Wilderness (MA7) or Wilderness Study areas (MA6). Management Area 13 (Special Interest Areas) is to be managed "to protect, and where appropriate, foster public use and enjoyment of unique scenic, geological, and botanical or zoological attributes." Wildernesses are managed to perpetuate the naturalness of the area, and Wilderness Study Areas are managed to

protect wilderness attributes. Management Area 13 includes the following sites that provide protection for these rare plant communities:

- **Grassy balds:** Roan Mountain, Big Bald Mountain, Fork Ridge – Mount Hardy, Craggy Mountain, Joyce Kilmer Memorial Forest at Stratton Bald.
- **Heath Balds:** Scaly Mountain and Catstairs, Whiteside Mountain, Standing Indian, Linville gorge, Fork Ridge – Mount Hardy, Mount Pisgah, Black Mountains, Craggy Mountain, Roan Mountain.
- **Forest Seep Wetlands:** Cullasaja Gorge, Scaly Mountain and Catstairs, Standing Indian, Fork Ridge – Mount Hardy, Black Mountains, Roan Mountain.
- **Mountain Bogs:** White Oak Stamp, Nantahala river Bogs, Fork Ridge – Mount Hardy, Pink Bed Bogs.
- **Barrens & glades:** Buck Creek serpentine barrens.
- **Shaded Rock outcrops:** Bonas Defeat Gorge with gneissic rock cliffs, Whitewater Falls, Camp Branch Falls, Dismal Falls, Looking Glass Rock, Cullasaja Gorge, Walking Fern Cove, Santeetlah Creek Bluffs, Nantahala Gorge.
- **Open Rock Outcrops:** Scaly Mountain and Catstairs, Cole Mountain-Shortoff Mountain, Slick Rock, Whiteside Mountain, Paint Rock, Looking Glass Rock, Cullasaja Gorge, Bonas Defeat, Ellicott Rock-Chattooga River.
- **Mountain ponds and ephemeral pools (vernal pools):** Linville Gorge, Nantahala River Bogs.
- **Caves:** Nantahala Gorge, Ellicott Rock-Chattooga River.
- **White Pine Forests:** Linville Gorge.

Sites where rare plant communities and other unique habitats occur outside of these areas, are protected through Forest-wide direction: “Protect the following community types when identified as unique in the botanical or wildlife analysis: caves and rare plant communities including bogs, rock cliffs, granitic domes, high elevation rocky summits, barrens and glades, balds, boulderfield forests, and seeps.” Alternatives 2 & 3 would add rock outcrops (shaded and open) as further unique habitats to protect (rock outcrops are defined in FEIS Volume II, Appendix L).

Alternatives 2 & 3 eliminate White Pine from the MIS list for two reasons: 1) there is disagreement among the scientific community concerning the validity of the Natural White Pine Forests, and 2) one of the best examples, although still in dispute, is within a protected Special Interest Area within the Linville Gorge Wilderness Area. Most white pine-dominated stands in the mountains are the result of clearing and are not considered

part of this natural community type. Natural White Pine Forests are distinguished by having ‘a well-developed *Pinus strobus*-dominated canopy which is not the result of human disturbance of another community type ... and can generally be recognized only on steep, inaccessible sites’ (Shafale and Weakley 1990).

In some instances, restoration activities, such as removal of woody plants encroaching in glades, rock outcrops, or other open forest-canopy communities and/or prescribed burning, may be necessary to maintain the unique components of a rare community or special habitat. In all such cases, the management objective of the activities would be to maintain or enhance the special communities. Analysis for such management would consider effects to the community as a whole, and separately evaluating MIS for these rare communities would be redundant and provide no additional information. This is different from management projects in more common habitats that may be proposed for other multiple use reasons, and where analysis of effects to an MIS can provide useful information to the decision maker in weighing the costs and benefits of proposed activities. For all of these reasons, it is not necessary to retain on the MIS list species associated with rare communities and special habitats, and deleting them from the list will have no effect on the communities themselves or the environment in general.

Effects to Other Terrestrial Biological Communities including: red-spruce/Fraser fir, northern hardwood forests, Carolina hemlock bluffs, rich cove forests, oak and oak-hickory forests, and xeric yellow pine forests

Alternative 1 (no action) has multiple MIS for each of the biological communities listed above. Alternative 2 retains just one MIS for each community, and other MIS associated with these communities are eliminated from the list. Alternative 3 retains one MIS for each community listed above except for oak and oak-hickory forest. Instead of listing an MIS for oak and oak hickory forests, “oak plant communities” is added to the species groups that would be monitored outside the MIS process, since no one species is appropriate for indicating effects of management on oak and oak-hickory forests.

Neither retaining the current list of MIS (Alternative 1) nor changing the list of MIS (Alternatives 2 & 3) would result in direct, indirect, or cumulative effects to any of these species population trends or trends in their associated habitat, since changing the list does not affect conditions in the forest. Changing the species selected to indicate the effects of management on a particular community has no effect on the community itself.

Deleting the golden-crowned kinglet, Carolina northern flying squirrel, solitary vireo, twisted stalk, black cherry, buckeye, basswood, red oak, white oak, hickories, pitch pine, Table mountain pine, and turkey beard from the MIS list while retaining Fraser fir, Carolina hemlock, ginseng, and pine warbler and adding ramps will adequately address the purpose these MIS categories serve. Rationales for deleting the vascular plants, mammal, and birds from the MIS list are presented in Table 3-1 and discussed below.

Table 3-1—MIS listed in Forest Plan Amendment 5 for Biological Communities Red Spruce-Fraser Fir Forests, Northern Hardwood Forests, Carolina Hemlock Bluffs, Rich Cove Forests, Oak and Oak-Hickory Forests, Xeric Yellow Pine Forests and reasons for deleting certain of these as MIS for this category

Common Name	Biological Community	Reason(s) for not Retaining MIS on List*
Fraser fir	Red spruce/Fraser fir	Not applicable -retained
Golden-crowned Kinglet	Red spruce/Fraser fir, Carolina hemlock bluffs,	1
Carolina northern flying squirrel	Red spruce/Fraser fir, northern hardwoods	1
Solitary vireo	Red spruce/Fraser fir, northern hardwood, coves	1, 2
Twisted stalk	Northern hardwoods	1
Ramps	Northern hardwoods	Not applicable - new
Black Cherry	Coves	1, 2
Buckeye	Coves	1
Basswood	Coves	1
Ginseng	Coves	Not applicable-retained
White Oak	Oak and oak-hickory forests	1, 2
Red Oak	Oak and oak-hickory forests	Retained in Alt. 2; for Alt. 3 - 1, 2
Hickories	Oak and oak-hickory forests	1, 2
Pine warbler	Xeric yellow pine forests	Not applicable-retained
Pitch Pine	Xeric yellow pine forests	1
Table Mt. Pine	Xeric yellow pine forests	1
Turkey beard	Xeric yellow pine forests	1, 3

*Reasons for Not Retaining MIS on List:

1 = Redundant (another MIS or a species monitoring group better represents this habitat and / or better reflects the direct impacts of management. 2 = The species has a broader ecological amplitude than formerly believed; therefore, it does not effectively represent the community/habitat element it was selected to represent. 3 = Distribution of species is limited geographically, occurring in only a portion of the range of the biological community it was selected to represent therefore reducing its effectiveness as an ecological indicator.

Deleting the northern flying squirrel and the golden crowned kinglet from the MIS list while retaining Fraser fir will have no effect on the species themselves or on the ability of the Forest Service to monitor the effects of management in spruce-fir biological communities. Although both the golden crowned kinglet and northern flying squirrel are good indicators of spruce-fir biological communities, Fraser fir is essential to the community and more directly reflects the impacts of management. Including all three species as MIS is redundant and creates an unnecessary effort that does not provide a commensurate improvement in the Forest Service’s ability to evaluate the impacts of management in spruce-fir biological communities. Removing the northern flying squirrel and golden crowned kinglet from the MIS list while retaining Fraser fir will result in no loss of information and does not imply that these species are no longer of interest or importance.

Forest-wide monitoring of the golden crowned kinglet will continue as part of the Region 8 Landbird strategy, and monitoring of the northern flying squirrel in the spruce-fir ecological zone will continue as part of the NFsNC threatened and endangered species monitoring program. These monitoring efforts are separate from analyzing the impacts of management activities on MIS population trends and serve a different purpose.

Deleting the solitary vireo and twisted stalk from the MIS list while adding ramps (*Allium tricoccum*) will have no effect on the species themselves or on the ability of the Forest Service to analyze the effects of management in Northern Hardwood biological communities. The solitary vireo has a broader ecological amplitude than formerly believed, that is, it can survive and reproduce in a variety of environmental conditions. It is found in a variety of habitats including mixed coniferous-hardwood, spruce-fir, hemlock, and white pine forests (Hamel 1992). This lack of a strong association with northern hardwoods reduces its reliability as an ecological indicator - that is, an indicator that suggest the effects of management practices on a broader set of species. Therefore, it is not an appropriate MIS for northern hardwood forests. Although twisted stalk is associated primarily with Northern Hardwood biological communities, the species is uncommon and not abundant when found. Twisted stalk has been documented in less than ¼ of all field plots classified as northern hardwood plant communities on the Nantahala and Pisgah National Forests and on 93% of the plots where the species was present, it was rated in the lowest abundance classes, trace and 0-1% cover (Peet et al. 1998). Both its infrequency and sparse cover reduces its usefulness as an ecological indicator and therefore it does not effectively represent northern hardwood forests. Adding ramps as the MIS for northern hardwood biological communities would enable the Forest Service to adequately analyze management effects in these habitats. Ramps are highly associated with this biological community and are sensitive to changes in light intensity and soil moisture that may occur following overstory vegetation management. Ramp populations are also sensitive to plant harvest intensity and timing, two factors that can be controlled through management. Ramps are not good ecological indicators of beech gaps and slopes, an environment that is uncommon on the Nantahala and Pisgah National Forests but often grouped with northern hardwoods. However, very little active management occurs in this zone and most of the important sites that support beech gaps and slopes on the Nantahala and Pisgah National Forests are assigned to their own management area (MA 13) and are protected by Forest Plan direction that govern activities there. Portions of six Special Interest Areas on the Nantahala and Pisgah National Forest support significant beech gap and slope forests. They include: Fork Ridge – Mount Hardy, Mount Pisgah, Big Bald Mountain, Craggy Mountain, Roan Mountain, and Standing Indian.

Deleting black cherry, buckeye, and basswood from the MIS list and maintaining ginseng will have no effect on the species themselves or on the ability of the Forest Service to analyze the effects of management in rich cove biological communities. Black cherry, buckeye, and basswood are not exclusively associated with rich coves and occur in a variety of mesic forests, therefore reducing their reliability as MIS. On the Nantahala and Pisgah National Forests, black cherry has a wide ecological amplitude and has been documented within all 11 ecological zones except the shortleaf pine-oak heath zone and

occurs within at least one-third of all plots in the spruce-fir, northern hardwood, high elevation red oak, rich cove, and mesic oak-hickory zones. Although more narrowly confined, basswood has been documented within 7 of the 11 ecological zones and within at least one-third of all plots in the acidic cove, rich cove, and mesic oak-hickory zones. Buckeye also has a more narrow amplitude, but has been documented within 6 of the 11 ecological zones and within at least one-third of all plots in both the northern hardwood and rich cove zones. Retaining ginseng as the MIS for rich coves would enable the Forest Service to adequately monitor management effects in this habitat. Ginseng is highly associated with this biological community and is sensitive to changes in light intensity and soil moisture that may occur following overstory vegetation management. Ginseng populations are also sensitive to plant harvest intensity and timing, two factors that can be controlled through management. Furthermore, rich cove plants will continue to be monitored as a species group separate from MIS requirements to evaluate species diversity, habitat relationships, and forestwide distribution.

Deleting red oak (Alternative 3 only), white oak, and hickories from the MIS list while adding oak communities to the list of species groups that will be monitored on a forest-wide basis separate from MIS requirements, will have no effect on the species themselves or on the ability of the Forest Service to analyze the effects of management in oak-hickory biological communities. Red oak, white oak, and hickories have a broader ecological amplitude than just oak-hickory forests because they are found in variety of dry to mesic habitats from low to high elevation. On the Nantahala and Pisgah National Forests, white oak has the widest ecological amplitude and has been documented within all 11 ecological zones except the spruce-fir zone. It occurs within at least one-third of all field plots used to characterize the rich cove, mesic oak-hickory, dry mesic oak-hickory, shortleaf pine-oak heath, chestnut oak, and white pine-oak heath zones. In addition, white oak is considered more of an indicator of oak-hickory forests in the Piedmont than in the Mountains. Hickories, in combination with oaks, have been documented in all 11 ecological zones. Although red oak, white oak, and hickories have their greatest association with oak-hickory biological communities, their frequency across a variety of habitat reduces their effectiveness as ecological indicators of oak-hickory. Red oak is found in five other ecological zones including northern hardwood, high elevation red oak, acidic cove, rich cove and chestnut oak, and it is often the dominant species in several of these zones. Furthermore, oak forests, most notably those that contain red oak, white oak, or chestnut oak, would be monitored as a species group separate from MIS requirements to evaluate forest-wide species composition and stand structure.

Deleting pitch pine, Table Mountain pine, and turkey beard from the MIS list while retaining the pine warbler would have no effect on the species themselves or on the ability of the Forest Service to analyze the effects of management in xeric yellow pine biological communities. Although xeric yellow pine forests occur across the Nantahala and Pisgah National Forest, turkey beard is only common northeast of the Asheville Basin on the Pisgah National Forest and very rare south of the Asheville Basin on the Nantahala National Forest. Less than 1/3 of the field plots used to characterize the pine-oak heath ecological zone, which includes xeric yellow pine forests, contained turkey

beard (Ulrey 1999). This lack of a strong association with xeric Yellow pine forests reduces the reliability of turkey beard as an ecological indicator, and therefore it does not effectively represent the community element it was selected to represent. Although both pitch pine and Table Mountain pine are good indicators of a portion of xeric yellow pine forests, neither is found in all xeric yellow pine stands, whereas pine warbler may be, so it can indicate the impacts of management across all xeric yellow pine forests. Including all three species as MIS is redundant and creates an unnecessary analysis effort that does not provide a commensurate improvement in the Forest Service's ability to evaluate the impacts of management. Removing pitch pine, Table Mountain pine, and turkey beard from the MIS list while retaining pine warbler will result in no loss of information and does not imply that these species are no longer of interest or importance. These changes would cause no loss of important information, no dilution of ability to analyze the effects of management, and no effects on the environment. Furthermore, pine oak heath forests, most notably those that contain pitch pine, Table Mountain pine, and turkey beard, would be monitored as a species group separate from MIS requirements, to evaluate forest-wide community composition and stand structure.

Effects to Habitat Components including: snags, dens and downed woody debris, old forest communities, riparian and alluvial forests, early successional habitat, contiguous forest areas with low disturbance, large contiguous forest areas, hard mast-producers, soft mast-producers, permanent grass-forb openings

Alternative 1 (no action) has multiple MIS for each of the habitat components listed above. Alternatives 2 retains just one MIS for each habitat component except for multiple indicators of early successional habitat, hard mast-producers, large contiguous forest areas, and permanent grass-forb. Alternative 3 retains one MIS for each habitat component except for large contiguous forest areas.

Neither retaining the current list of MIS (Alternative 1) nor changing the list of MIS (Alternatives 2 & 3) would result in direct, indirect, or cumulative effects to any of these species population trends or trends in their associated habitat components, since changing the list does not affect conditions in the forest. Changing the species selected to indicate the effects of management on a particular habitat component has no effect on the habitat itself.

Deleting raccoon, rabbit, gray squirrel, bobcat, mink, veery, solitary vireo, northern parula warbler, yellow-bellied sapsucker, white-breasted nuthatch, cedar waxwing, field sparrow, eastern meadowlark, Blue Ridge two-lined salamander and eastern wild turkey (Alternative 3 only) from the MIS list while retaining black bear, white-tailed deer, eastern wild turkey (Alternative 2), ovenbird, rufous-sided towhee, ruffed grouse, pileated woodpecker, and adding Acadian flycatcher will adequately address the purpose these MIS categories serve. Rationales are presented in Table 3-2 and discussed below.

Table 3-2—MIS listed in Forest Plan Amendment 5 for Habitat Components snags, dens and downed woody debris, old forest communities, riparian and alluvial forests, early successional habitat, large contiguous forest areas with low disturbance, large contiguous forest areas, hard mast-producers, soft-mast producers, permanent grass-forb openings and reasons for deleting certain of these as MIS for this category.

Common Name	Component(s) Indicated	Reason(s) for not Retaining MIS on List*
Black bear	Old forest communities, large contiguous forest areas with low disturbance, hard mast-producers	Not applicable -retained
White-tailed deer	Demand species, permanent grass-forb	Not applicable -retained
Eastern wild turkey	Demand species (uses hard mast, early successional habitat and permanent grass/forb openings)	Retained in Alt. 2, Alt. 3 = 1
Ovenbird	Large contiguous forest areas with low disturbance	Not applicable -retained
Rufous-sided towhee	Early successional habitat (0-10)	Not applicable -retained
Ruffed grouse	Early successional habitat (11-20), soft mast downed woody debris, (also a demand species)	Not applicable -retained
Pileated woodpecker,	Snags and dens	Not applicable -retained
Acadian flycatcher	Riparian (alluvial is a subset of riparian)	Not applicable -new
Raccoon	Alluvial forests, snags and dens	1
Rabbit	Early successional, permanent grass-forb	1
Gray squirrel	Hard mast-producing species, small snags and dens	1
Bobcat	Early successional	1
Mink	Alluvial forests	1
Veery	Large contiguous forests	1
Solitary vireo	Large contiguous forests	1
Northern parula warbler	Large contiguous forests	1
Yellow-bellied sapsucker	Small snags and dens	1
White-breasted nuthatch	Small snags and dens	1
Cedar waxwing	Soft mast-producing species	1
Field sparrow	Early successional	1
Eastern meadowlark	Permanent grass/forb openings	3
Blue Ridge two-lined salamander	Alluvial forests	1
Grapes	Soft mast-producers	1

Reasons for Not Retaining MIS on List:

***1 = Redundant (another MIS or a species monitoring group better represents this habitat and / or better reflects the direct impacts of management. 2 = The species has a broader ecological amplitude than formerly believed; therefore, it does not effectively represent the community/habitat element it was selected to represent. 3 = Distribution of species is limited geographically, occurring in only a portion of the range of the biological community it was selected to represent therefore reducing its effectiveness as an MIS.**

Table 3-2B lists the habitat components and compares which MIS represent(s) that component in each of the three alternatives.

Table 3-2B. Comparison by alternative of MIS for each habitat component

Habitat Component	Alternative 1	Alternative 2	Alternative 3
Snags and dens, and downed woody debris	Black bear, raccoon, gray squirrel, pileated woodpeckers, yellow-bellied sapsucker, white-breasted nuthatch	Pileated woodpecker, ruffed grouse (downed woody debris)	Pileated woodpecker, ruffed grouse
Old forest communities	Black bear, bats, pileated woodpeckers	Black bear	Black bear
Riparian/alluvial forests	Raccoon, mink, Blue Ridge two-lined salamander	Acadian flycatcher	Acadian flycatcher
Early successional	White-tailed deer, rabbit, bobcat, rufous-sided towhee, field sparrow	Rufous-sided towhee(0-10 years), ruffed grouse (11-20 years)	Rufous-sided towhee (0-10 years), ruffed grouse (11-20 years)
Large contiguous forest areas with low disturbance	Black bear, veery, solitary vireo, northern parula warbler, ovenbird, eastern wild turkey	Black bear (low disturbance), ovenbird	Black bear (low disturbance), ovenbird
Hard-mast producers	Black bear, white-tailed deer, gray squirrel, eastern wild turkey	Eastern wild turkey	Black bear
Soft-mast producers	Cedar waxwing, grapes	Ruffed grouse	Ruffed grouse
Permanent grass/forb openings	Rabbit, eastern wild turkey, eastern meadowlark	Eastern wild turkey, white-tailed deer	White-tailed deer

Retaining pileated woodpecker and ruffed grouse while deleting raccoon, gray squirrel, yellow-bellied sapsucker and white-breasted nuthatch as indicators for snags, dens and large woody debris in both Alternatives 2 and 3 would have no effect on the species themselves, the habitat component, or on the ability of the Forest Service to analyze the effects of management on this habitat component. Forest Plan direction and standards would still require the retention of dens and snags during management activities, and compliance with this standard is easily monitored through implementation checks. Pileated woodpecker would be an adequate indicator for snags since it is a primary excavator of fairly large trees and is easily monitored. Ruffed grouse would be an adequate indicator for downed woody debris since it relies on this habitat component for drumming, and it is easily monitored. Raccoon and gray squirrel were originally included on the MIS list in part due to their being species in demand for hunting, although they certainly also utilize various habitat components. Eliminating them from the MIS list reduces redundancy both in indicators of these habitat components and in the list of indicators of demand (game) species. Information on these species would still be available from the North Carolina Wildlife Resources Commission (NCWRC), so their elimination from the MIS list would not result in any change in the information available, nor is it an indication of a loss of interest in the species. Including all six species as MIS is redundant and creates an unnecessary analysis effort that does not provide a commensurate improvement in the Forest Service’s ability to evaluate the impacts of management on snags, dens, and down woody debris.

Retaining black bear and deleting lung lichen as an indicator of old forest communities in both Alternatives 2 and 3 would have no effects on the species themselves, the habitat component or the ability of the Forest Service to analyze the effects of management on this habitat component. Recent surveys indicate lung lichen is not closely tied to old forest habitat as was previously thought, and it is unclear if our management impacts population trends, which is a factor in the selection of MIS. While black bear use a number of habitats and components, old mature stands are a needed component of black bear habitat to provide secure denning sites, and black bear concurrently is an indicator of large contiguous forest areas with low levels of human disturbance. There is good population trend information available for black bear; whereas such is not the case for lung lichen, also a factor in the selection of MIS. Forest Plan direction and standards require that large, medium, and small old growth patches be designated across the national forest landscape, and compliance with this direction is still required. Information on old forest communities is available from project surveys, volunteer surveys, and agency databases, so there would be no loss of information to the agency.

Retaining black bear and ovenbird and deleting veery, solitary vireo and northern parula warbler as indicators of large contiguous forest areas in Alternatives 2 and 3 would have no effects on the species themselves, the habitat component or the ability of the Forest Service to analyze the effects of management on this habitat component. Veery tend to be found at higher elevation large contiguous forest areas, and northern parula warblers tend to be more associated with riparian habitat within large contiguous forest areas. Solitary vireos tend to favor mixed conifer-hardwood forests, spruce-fir, white pine and hemlock forests, or hardwood forests mainly over 3,500 feet. Ovenbirds occur more widely in large contiguous mixed forests in a diversity of locations.

Eliminating Blue Ridge two-lined salamander, mink and raccoon as indicators of alluvial forest and replacing them with Acadian flycatcher as an indicator of riparian forest in Alternatives 2 and 3 would have no effects on the species themselves, the habitat component or the ability of the Forest Service to analyze the effects of management on riparian or alluvial forest. Alluvial forest is a habitat uncommon on the Nantahala and Pisgah since it typically occurs along river flood plains. Riparian habitat, however, is common across the Forests, being associated with waterbodies of all types, and encompassing alluvial forests within its broader definition. Riparian habitat is the more appropriate habitat component to track for the purposes of national forest management activities. Acadian flycatcher is easily monitored and strongly associated with riparian habitat, both factors to consider in the selection of MIS. Blue ridge two-lined salamander is less easily monitored, less strongly associated with riparian habitat, and population trends are not well established. Although mink is greatly associated with riparian forests, it will inhabit all kinds of wet areas, and its habits make it difficult to monitor. Raccoon is a habitat generalist, and its population trends are difficult to associate with national forest management. There would be no loss of information regarding these species since they would be monitored separately from MIS requirements: raccoon and mink by NCWRC since they are demand species, and Blue Ridge two-lined salamander as part of the salamander species group surveys being proposed in this amendment. Also, Forest Plan direction and standards specify desired conditions for riparian habitat, and the effects of

management on riparian habitat are easily evaluated through implementation checks and Forest Plan monitoring.

Retaining rufous-sided towhee and ruffed grouse while eliminating rabbit, bobcat, and field sparrow as indicators of early successional habitat would have no effects on the species themselves, the habitat component or the ability of the Forest Service to analyze the effects of management on this habitat component. Forest Plan direction and standards specify desired conditions for creation of early successional habitat, and the effects of management activities on this habitat are included in project level environmental assessments. Rufous-sided towhee is more associated with the type of early successional habitats that occur on Forest lands than field sparrow. Rabbit and bobcat were originally selected in part because they are in demand for hunting. Eliminating them from the MIS list reduces redundancy in both early successional indicators and demand indicators (game species).

Retaining eastern wild turkey, black bear, and red oak in Alternative 2 and black bear in Alternative 3 as indicator(s) of hard mast-producers while eliminating gray squirrel (along with eastern wild turkey and red oak in Alternative 3) would have no effects on the species themselves, the habitat component or the ability of the Forest Service to analyze the effects of management on this habitat component. The Forest actively manages to promote hard mast-producers to improve wildlife habitat, and the effects of management can be evaluated directly through implementation monitoring. In addition, Alternative 3 calls for the addition of “oak plant communities” – oaks being the most important hard-mast producers – to the species groups to be monitored separately from MIS requirements. Eastern wild turkey would continue to be tracked by the NCWRC since it is a demand species, and the USDA Forest Service cooperates with this effort. Black bear rely on hard mast to carry them over the winter, and the size of the mast crop is associated with reproductive success. There is a strong association between black bear and hard mast. Alternative 3 removes red oak from the MIS list in favor of adding “oak plant communities” to the species group monitoring since the species group monitoring approach – unrelated to MIS requirements – is expected to provide more meaningful information over the long run to use in management decisions than would be derived from analyzing effects to population trends of a single oak species.

Retaining both white-tailed deer and eastern wild turkey in Alternative 2 and white-tailed deer in Alternative 3 as indicators of permanent grass-forb openings, while eliminating rabbit and eastern meadowlark in both Alternatives 2 & 3 plus eastern wild turkey in Alternative 3, would have no effects on the species themselves, the habitat component or the ability of the Forest Service to analyze the effects of management on this habitat component. Permanent grass-forb openings are virtually always a result of active management and therefore can easily be tracked directly from analysis of project activities. Eastern wild turkey and rabbit were both originally selected in part because they are demand species – so they will continue to be tracked by NCWRC separate from the MIS requirements. Eastern meadowlark really doesn't occur on the Forests since it is a species more associated with large agricultural fields.

Retaining ruffed grouse while eliminating grapes and cedar waxwing in Alternatives 2 and 3 as an indicator of soft mast producing species would have no effects on the species themselves, the habitat components or the ability of the Forest Service to analyze the effects of management on this habitat component. Cedar waxwings prefer open, mature conifers; openings or margins of spruce-fir forests, hemlocks, or white pines; residential areas with scattered trees; groves and margins of bogs. During the summer, waxwings feed primarily on insects, but in the winter they ingest mainly berries from shrubs and trees. Ruffed grouse use a wider variety of forest types, and soft mast is an important component of their diet year round. Grapes contain several species, and multi-species assemblages are inappropriate for MIS. Also, the abundance of vines is not a clear indication of the abundance of fruit, since fruiting occurs best only in certain situations.

Effects to Terrestrial Wildlife

MAMMALS

Of the nine mammals currently on the MIS list (Alternative 1), only two (black bear and white-tailed deer) are proposed to be retained in both Alternatives 2 & 3. The Carolina northern flying squirrel is a federally endangered species that inhabits spruce-fir and northern hardwood forests at high elevations. The North Carolina Wildlife Resources Commission, with assistance from the U.S. Forest Service, has monitored the Carolina northern flying squirrel for several years, and will continue to do so. Protective measures for Endangered, Threatened, Sensitive, and Locally Rare species at the project level are ensured through Biological Evaluations completed for all proposed management actions carried out on the Nantahala and Pisgah National Forests prior to decisions being made. Having a species designated a management indicator as well as Endangered, Threatened, Sensitive, or Locally Rare confers no additional protection and provides for no additional monitoring. None of the alternatives would have any effect on these species or on compliance with the Endangered Species Act. All the alternatives would have no effect on the environment.

Bats represent caves, which is a protected special habitat in the Forest Plan. Two bats, the Indiana bat and the Virginia big-eared bat, are federally endangered species, while the Eastern small-footed bat and Rafinesque's big-eared bat are Sensitive species. Protective measures for Endangered, Threatened, Sensitive, and Locally Rare species at the project level are ensured through Biological Evaluations completed for all proposed management actions carried out on the Nantahala and Pisgah National Forests prior to decisions being made. Having a species designated a management indicator as well as Endangered, Threatened, Sensitive, or Locally Rare confers no additional protection and provides for no additional monitoring. None of the Alternatives would have any effect on these species or on compliance with the Endangered Species Act. All the alternatives would have no effect on the environment. Also bats, as a group, are currently being monitored across the Nantahala and Pisgah National Forests. Therefore, dropping them from the MIS list would not have any effect on them.

The remaining mammals, raccoon, rabbit, gray squirrel, bobcat, and mink, are all game species that are typically hunted or trapped. The raccoon and mink were originally listed as MIS to represent alluvial forests – a subset of riparian forest. However, the Acadian flycatcher is a better representative of riparian forests than these mammals, which tend to be more habitat generalists. The rabbit and bobcat are indicative of early successional habitat, and other species are being retained to better represent that habitat. The gray squirrel represents hard mast producing species, but another species would be retained to represent the hard mast. All of these species have had lesser demand for hunting more recently. The NCWRC currently monitors these species, and the Commission will continue to do so they can maintain healthy populations.

BIRDS

All 17 birds currently on the MIS list are being monitored in some way. Because the peregrine falcon was once listed as an endangered species but has been delisted, monitoring for the falcon continues as part of the recovery of this species. Ruffed grouse and eastern wild turkey are monitored by the NCWRC as well as the U.S. Forest Service by doing drumming counts, hunter surveys, gobbler counts, and brood surveys since these birds are game species. The other 14 birds are migrants. They are all being monitored through annual point count surveys (for the Region 8 Landbird Strategy) and breeding bird surveys.

None of the alternatives would change the current monitoring of these species. Birds would continue to be a species group that would be monitored across the Forests. None of the alternatives would have an effect on the birds or current monitoring efforts.

SALAMANDERS

There are currently four species of salamanders listed as MIS (Alternative 1). These are the green salamander, Jordan's salamander, spotted salamander, and Blue Ridge two-lined salamander. Three of these species represent special habitats that are already protected by Forest Plan direction (see page 20). The green salamander and Jordan's salamander represent shaded rock outcrops, and the spotted salamander represents ephemeral ponds. The Blue Ridge two-lined salamander represents riparian forests. Although these species are proposed for elimination from the MIS list, salamanders are being retained as a group for monitoring purposes separately from MIS requirements. The NCWRC also monitors salamanders, especially those that are considered rare in the state.

None of the alternatives would have an effect on these species. Salamanders are a species group that would be monitored across the Nantahala and Pisgah National Forests; therefore, information would continue to be collected about these salamanders.

Effects to Threatened, Endangered, Proposed Threatened, Proposed Endangered, Sensitive, and Locally Rare species populations.

TERRESTRIAL SPECIES

There would be no direct or indirect effects on monitoring or protection of Threatened, Endangered, Proposed Threatened, Proposed Endangered, Sensitive or locally rare species from any of the three alternatives; therefore, there would be no cumulative effect. There would be no change in efforts to recover or enhance habitat for any species due to their retention or non-retention on the list of MIS.

Three of the currently listed MIS—the Carolina northern flying squirrel (*Glaucomys sabrinus coloratus*) an ecological indicator of Red Spruce-Fraser Fir Forests, the Indiana bat (*Myotis sodalis*), and Virginia Big-eared bat (*Plecotus townsendii virginianus*) both ecological indicators of caves, are also listed as federally Endangered.

Ten of the MIS currently listed for the Nantahala and Pisgah National Forests are listed as Sensitive species by the Forest Service’s Southern Region, and 14 of the MIS currently listed for the Nantahala and Pisgah National Forests are listed as Locally Rare species by the National Forests in North Carolina:

Sensitive Species		
Common name	Scientific name	Ecological indicator of:
Peregrine falcon	<i>Falco peregrinus</i>	Open rock outcrops
Biltmore sedge	<i>Carex biltmoreana</i>	Open rock outcrops
Wretched sedge	<i>Carex misera</i>	Open rock outcrops
Carolina hemlock	<i>Tsuga caroliniana</i>	Carolina hemlock bluffs
Eastern small-footed bat	<i>Myotis leibii leibii</i>	Caves
Rafinesque’s big-eared bat	<i>Corynorhinus rafinesquii</i>	Caves
Carolina saxifrage	<i>Saxifraga caroliniana</i>	Shaded rock outcrops
Carolina alumroot	<i>Heuchera caroliniana</i>	Shaded rock outcrops
Maple-leaf alumroot	<i>Heuchera longiflora var. aceroides</i>	Shaded rock outcrops
Sphagnum moss	<i>Sphagnum flavicomans</i>	Mountain bogs
Locally Rare Species		
Green Salamander	<i>Aneides aeneus</i>	Shaded rock outcrops
Sphagnum moss	<i>Sphagnum angustifolium, Sphagnum capillifolium, Sphagnum fallax, Sphagnum flexuosum, Sphagnum pylaesii, Sphagnum russowii, Sphagnum squarrosum, Sphagnum subsecundum, Sphagnum tenellum, and Sphagnum warnstorffii</i>	Mountain bogs.
Prairie dropseed	<i>Sporobolus heterolepsis</i>	Barrens and glades
Slender Wheatgrass	<i>Elymus trachycaulus</i>	Barrens and glades
Lung lichen	<i>Lobaria serobiculata</i>	Old forests

Deleting all federally listed species from the MIS list would have no effect on monitoring for these or any other Threatened, Endangered, Proposed Threatened, Proposed Endangered, Sensitive, or Locally Rare species on the Nantahala and Pisgah National Forests. Existing monitoring efforts will continue for all 24 species (and all other Threatened, Endangered, Sensitive, and Locally Rare species). Changes in the populations of these 24 species proposed to be removed from the MIS list (Alternatives 2 and 3) are not considered related to management activities. Long-term persistence of the populations are of concern for other reasons. Monitoring for these species is intended mainly to detect threats from such activities as unauthorized harvesting or collection of plants or animals and disturbance of sensitive habitats by vehicle or foot traffic. The degree to which the Forest Service succeeds at limiting such threats is far more meaningful than retaining them as MIS (Alternative 1).

Protective measures for Proposed, Endangered, Threatened, Sensitive, and Locally Rare species at the project level are ensured through Biological Evaluations completed for all proposed management actions carried out on the Nantahala and Pisgah National Forests prior to decisions being made. Having a species designated a MIS as well as Proposed, Endangered, Threatened, Sensitive, or Locally Rare confers no additional protection and provides for no additional monitoring. In addition, many of the important sites that support rare plant communities and other unique habitats on the Nantahala and Pisgah National Forests are assigned to their own management area (MA 13) and are protected by Forest Plan direction that govern activities there. Protection is also provided for sites where rare plant communities and other unique habitats occur outside of these areas, through Forest-wide direction. Protection can take many forms, for example: closure orders restricting access to sites such as some rock cliffs; avoidance, i.e., marking protected areas such as wetlands to avoid during management activities; active restoration such as using prescribed fire to restore barrens or grazing to restore balds; barriers or physical devices such as bars across cave entrances. None of the Alternatives would have any effect on these species or on compliance with the Endangered Species Act or with Forest Service Manual 2670 direction concerning Sensitive species (see the Biological Evaluation in Appendix A). The alternatives proposed would have no effect on the environment.

AQUATIC SPECIES

Protective measures for Proposed, Endangered, Threatened, Sensitive, and Locally Rare species at the project level are ensured through Biological Evaluations completed for all proposed management actions carried out on the Nantahala and Pisgah National Forests prior to decisions being made. Having a species designated a management indicator as well as Proposed, Endangered, Threatened, Sensitive, or Locally Rare confers no additional protection and provides for no additional monitoring.

One of the currently listed MIS, the spotfin chub (*Cyprinella monacha*), an indicator of warmwater streams, is federally listed as Threatened. It is the only individually identified rare aquatic species currently listed as a management indicator.

Several freshwater mussel species are state- or federally-listed, and numerous other aquatic invertebrates have been identified as being rare enough to generate concern. These mussel, aquatic insect, and crayfish species are intensively monitored through the implementation of recovery plans (in the case of federally –listed species) and other State and Federal monitoring programs, as described above.

Existing monitoring efforts will continue for all rare species (including the spotfin chub). Changes in the populations of the spotfin chub are not considered effective indicators of active management on the Forests. First, the range and distribution of the species is severely limited, a majority of which does not occur on Forest Service land. Second, the species better represents particular habitat elements rather than overall warmwater stream health or effects of management. Both of these factors mean the species does not adequately serve the purpose of MIS.

Effects to Stream Health and Diversity

CHANGES TO ECOLOGICAL INDICATORS

Alternatives 2 and 3 remove aquatic invertebrates, Index of Biotic Integrity and freshwater mussels from the MIS list. While they would be removed from the MIS list, aquatic invertebrates and freshwater mussels are included in the species group monitoring, separate from MIS requirements. There would be no change in the monitoring taking place. The only change is a change of categories to better meet the regulatory requirements associated with MIS; multi-species assemblages are inappropriate as MIS due to these requirements. The Index of Biotic Integrity (IBI) is a protocol used to monitor aquatic communities in numerous situations. It is a tool, not a species, and therefore inappropriate for the MIS list. The IBI has been, and will continue to be, one of the tools used to monitor aquatic communities across the Forests. None of the proposed alternatives would directly, indirectly, or cumulatively affect the aquatic communities themselves or the aquatic environment in general.

Aquatic invertebrate communities have been and will continue to be monitored across the Forests in several ways. First, community health and composition are assessed across the Forests in cooperation with the North Carolina Division of Water Quality Bioassessment Group (NCDWQ-BA) as part of their long-term monitoring efforts across each river basin in the State. Many of these long-term sites occur on or immediately adjacent to the Forests.

Second, rare aquatic species (including Federally-listed, Sensitive, and Locally Rare aquatic species) are surveyed for during project analysis of every ground disturbing activity (near water). When a rare species is found, the location is mapped and protected during project implementation and periodically monitored. These populations are reported to the North Carolina Natural Heritage Program (NCNHP) for inclusion in their database, which is strengthened by every addition. This database allows the Forest Service to wholly analyze effects on rare aquatic species, using the best occurrence information available.

And third, when large groups of species begin to appear on the NCNHP list of rare aquatic species (e.g. odonates (dragonflies and damselflies) or crayfish), the Forest Service can initiate comprehensive survey efforts for the species to augment scientific knowledge of species' populations and habitats. Often, species get listed as rare simply because no such comprehensive survey effort has been conducted.

Freshwater mussel populations across the Forests are extremely well-documented, and continue to be monitored cooperatively by the Forest Service, North Carolina Wildlife Resources Commission (NCWRC), United States Fish and Wildlife Service (USFWS), and a host of other partners. Each population is closely watched, and all suitable habitat is monitored annually (and frequently, more often). No alternative would change this. Major threats to freshwater mussel populations across the Forests are the time-lag effects of historical land use on aquatic habitat and fish communities and the introduction and expansion of invasive exotic freshwater clam species such as the Asian clam and the zebra mussel.

It is important to note that in addition to existing State and Federal water-related laws and regulations (e.g. North Carolina Sediment and Pollution Control Act, Clean Water Act), all aquatic resources across the Forests are protected by the Land and Resource Management Plan (LRMP) Management Area designation "Management Area 18, Riparian Areas". This designation disallows any land management activity that does not benefit riparian dependent resources, including aquatic ecosystems. One exception to this is the allowance of properly designed stream crossings along roads and trails, with strict site-specific mitigation where necessary. Additionally, some aquatic resources are further protected by inclusion in designated wilderness or wilderness study areas (Management Areas 7 and 6, respectively) or Special Interest Areas (Management Area 13, where all resources are to be managed "to protect, and where appropriate, foster public use and enjoyment of unique scenic, geological, and botanical or zoological attributes").

REDUCING REDUNDANCY OF INDICATORS

Deleting sculpin species (*Cottus sp.*) from the list of MIS for coldwater streams, while retaining wild populations of brook, brown, and rainbow trout (*Salvelinus fontinalis*, *Oncorhynchus mykiss*, and *Salmo trutta*, respectively) and blacknose dace (*Rhinichthys atratulus*), would continue to adequately address the purpose this MIS category serves (i.e. indicating effects of land management on coldwater streams). Sculpin species do not occur throughout the Forests, and therefore do not represent all coldwater streams. The distribution of the species is limited to Tennessee Valley watersheds (i.e. Mississippi River basin), which excludes parts of the Grandfather, Highlands, and Pisgah Ranger Districts draining down the Atlantic Slope. One or another of the trout species can be found across the Forests, making the trout appropriate as MIS. Blacknose dace have somewhat different habitat requirements that make them appropriate as MIS and not redundant with trout: they occupy a different trophic level, occupy some stream reaches that don't have trout, and are highly sensitive to changes in water quality.

Deleting the white sucker (*Catostomus commersoni*) and redhorse suckers (*Moxostoma sp.*) from the list of MIS for warmwater streams, while retaining smallmouth bass (*Micropterus dolomieu*), would continue to adequately address the purpose this MIS category serves (i.e., indicating effects of land management on warmwater streams). The rationale for deleting white and redhorse suckers is largely due to the species' life history strategies. Both white suckers and many species of redhorse suckers are among the fish species most tolerant to environmental change. Monitoring population trends of these species simply does not show effects of management. In addition, because of the habitats they occupy (i.e., deeper depths and stream or river bottoms – they are bottom feeders), they are extremely difficult to effectively sample at a level quantitative enough to establish population estimates. Smallmouth bass, on the other hand, is easily monitored and more sensitive to changes in water quality.

Effects to Lake, Pond, and Reservoir Health and Diversity.

REDUCING REDUNDANCY OF INDICATORS

Deleting the bluegill (*Lepomis macrochirus*) from the list of MIS for lakes, ponds, and reservoirs, while retaining largemouth bass (*Micropterus salmoides*) would continue to adequately address the purpose this MIS category serves (i.e., indicating effects of land management on lakes, ponds, and reservoirs). Somewhat better information is available for largemouth bass than bluegill, making bass an appropriate choice as MIS. The rationale for deleting bluegill is simply one of redundancy. Because of their ecological (i.e., important prey base) and social (i.e., angling) values, bluegill populations will continue to be monitored for reasons not associated with MIS requirements.

3.2 Physical Resources

None of the considered alternatives would have any direct, indirect, or cumulative effect to any physical resource (soil productivity, water quality, air quality) since changing the list does not affect conditions in the forest. Changing the species selected to indicate the effects of management on a particular forest community has no effect on the physical condition of the community. The change only affects data collection and analyses that feed into the Forest planning process, monitoring and evaluation reports, and project environmental assessments.

3.3 Social and Economic Resources

Neither retention of the current MIS list or shortening the list would have any direct, indirect, or cumulative effect to any social or economic resource since changing the list does not effect social or economic conditions. No activity is proposed that would impact human health and safety. Changing the species selected to indicate the effects of management would change data collection and analyses that feed into the Forest planning process, monitoring and evaluation reports, and project environmental assessments. The

nature of monitoring activities would change in that Alternatives 2 and 3 add species group monitoring, and this monitoring would likely involve field surveys. These are not inherently different from a safety perspective from any forest related outdoor activity such as hiking or nature study. There would be no effect to outdoor recreation opportunities or Forest aesthetics since changing the MIS list does not impact recreation opportunities or scenery management on the Forests. Changing the MIS list would not affect hunting opportunities since this proposal would not change the availability, amount or condition of habitat for demand species, or the population trends of the demand species.

This proposal has no potential for effect to a wilderness, wilderness study area, or wild and scenic river, since it does not involve any changed condition on the Forests.

This proposal has no potential for effect, adverse or beneficial, to a heritage resource, and is an Exempt Undertaking; therefore no further Section 106 compliance documentation is required.

This proposal has no potential for effect to prime farmlands, rangelands or forestlands, parklands, wetlands or floodplains, since it does not involve any changed condition on the Forests.

ENVIRONMENTAL JUSTICE

The alternatives were assessed to determine whether they would disproportionately impact minority or low income populations, in accordance with Executive Order 12898. No local minority or low income populations were identified during scoping or effects assessment. No minority or low income populations are expected to be impacted by implementation of any of the alternatives.

RELATIONSHIP BETWEEN SHORT-TERM USE AND LONG-TERM PRODUCTIVITY

Short-term uses can be thought of as those that take place in the time span of a year, more or less. Long-term productivity refers to the ability of the land to produce a continuous supply of a resource in perpetuity. This amendment does not propose any changes to short-term use of the Forest. It would be an administrative decision that changes the list of MIS available for use in analyzing the effects of alternatives presented in future project-level environmental assessments or environmental impact statements. This is procedural in nature and does not have on-the-ground impacts. This amendment also changes the list of species groups that would be monitored to assess Forest conditions. The *added* species group monitoring is not expected to require any removal of specimens from the field, therefore would not have either short-term or long-term impacts. *Existing* aquatic invertebrate monitoring, which would continue under all alternatives, typically does remove individuals from the field for identification. However, this is not an action that impacts these populations in either the short-term or the long-term since they exist in such high numbers and monitoring removes comparatively tiny numbers of individuals from minute portions of waterbodies.

Relationship to the Forest Plan

No alternative changes any Forest Plan goals, objectives, desired conditions, management prescriptions, land allocation, timber suitability, or type or amount of outputs of good or services provided. In particular, they does not change the habitat objectives for maintaining viable populations as identified in the Final Supplement to the Final Environmental Impact Statement (Volume II) for Forest Plan Amendment 5. The scope is limited to adding, retaining, or deleting management indicator species, retaining or adding species groups to be monitored, and associated wording changes in the Forest Plan. Neither the timing, the location not size of the area affected are grounds for considering this to be a significant amendment, since no alternative impacts forest resources. Therefore, this would not be a significant amendment to the Forest Plan

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APPENDIX A —BIOLOGICAL EVALUATION
BIOLOGICAL EVALUATION
USDA FOREST SERVICE, SOUTHERN REGION
NANTAHALA / PISGAH NATIONAL FORESTS
AMENDMENT 17
TO THE LAND AND RESOURCE MANAGEMENT PLAN

INTRODUCTION

The purpose of this biological evaluation (BE) is to document potential effects of the proposed Amendment, on proposed, endangered, threatened, or sensitive species or their habitat, and to ensure that management decisions can be made with the benefit of such knowledge. The objectives of this evaluation are to:

1. Ensure Forest Service actions do not contribute to a loss of viability of any plant or animal species or cause a trend toward federal listing of any species.
2. Comply with the requirements of the Endangered Species Act that actions by federal agencies not jeopardize or adversely modify critical habitat of federally listed species.
3. Provide a process and a standard by which Threatened, Endangered, and Sensitive (TES) species receive full consideration in the decision-making process.

PROPOSED ACTION AND AFFECTED AREA

The proposed action is to amend the Nantahala / Pisgah Land and Resource Management Plan (LRMP) to streamline the composition of the current Management Indicator Species (MIS), make changes to the Forest Plan species group monitoring, and associated changes in Forest Plan direction. Please refer to the Environmental Assessment for Forest Plan Amendment 17 for more specific information on this proposal.

The project area includes the entire Nantahala and Pisgah National Forests (N/P) in the State of North Carolina.

SPECIES EVALUATED AND METHODS USED

The Regional Forester's Sensitive Species List currently (2001 list revision) lists 220 sensitive species as potentially occurring on the N/P. In addition, there are 24 Proposed, Threatened or Endangered species that occur or potentially occur on the N/P. These species are listed in Table 1. All of these were considered in the effects analysis.

Table 1: Threatened, Endangered, and Sensitive Species that occur or are likely to occur on the Nantahala / Pisgah National Forests (**Bold** type indicates species that are also MIS)

Group	Scientific Name	Common Name	G-Rank
Federally Listed Species			
Bird	<i>Haliaeetus leucocephalus</i>	Bald Eagle	G4
Fish	<i>Cyprinella monacha</i>	Spotfin Chub	G2
Insect	<i>Microhexura montivaga</i>	Spruce-fir Moss Spider	G1
Mammal	<i>Canis rufus</i>	Red Wolf	G1
Mammal	<i>Corynorhinus town. Virginianus</i>	Virginia Big-eared Bat	G4T2
Mammal	<i>Felis concolor cougaur</i>	Eastern Cougar	G1
Mammal	<i>Glaucomys sabrinus coloratus</i>	Carolina Northern Flying Squirrel	G5T1
Mammal	<i>Myotis sodalis</i>	Indiana Bat	G2
Mollusk	<i>Mesodon clarki nantahala</i>	Noonday Globe	G2T1
Mollusk	<i>Pegias fabula</i>	Little-wing Pearly Mussel	G1
Nonvasc. Plant	<i>Gymnoderma lineare</i>	Rock Gnome Lichen	G2
Vascular Plant	<i>Geum radiatum</i>	Spreading Avens	G1
Vascular Plant	<i>Helonias bullata</i>	Swamp Pink	G3
Vascular Plant	<i>Hexastylis naniflora</i>	Dwarf-flowered Heartleaf	G2
Vascular Plant	<i>Houstonia montana</i>	Mountain Bluet	G5T2Q
Vascular Plant	<i>Hudsonia montana</i>	Mountain Golden-Heather	G1
Vascular Plant	<i>Isotria medeoloides</i>	Small Whorled Pogonia	G2G3
Vascular Plant	<i>Liatris helleri</i>	Heller's Blazing Star	G2
Vascular Plant	<i>Sagittaria fasciculata</i>	Bunched arrowhead	G1
Vascular Plant	<i>Sarracenia jonesii</i>	Mountain Sweet Pitcher Plant	G3T1
Vascular Plant	<i>Sarracenia oreophila</i>	Green Pitcher Plant	G2
Vascular Plant	<i>Sisyrinchium dichotomum</i>	White Irisette	G2
Vascular Plant	<i>Solidago spithamaea</i>	Blueridge Goldenrod	G1
Vascular Plant	<i>Spiraea virginiana</i>	Virginia Spiraea	G2
Sensitive Species			
Amphibian	<i>Desmognathus santeetlah</i>	Santeetlah dusky salamander	G3Q
Amphibian	<i>Eurycea junaluska</i>	Junaluska salamander	G3Q
Amphibian	<i>Plethodon aureolus</i>	Tellico salamander	G2G3Q
Amphibian	<i>Plethodon teyahalee</i>	Southern Appalachian salamander	G2G3Q
Amphibian	<i>Plethodon welleri</i>	Weller's salamander	G3
Bird	<i>Falco peregrinus</i>	Peregrine Falcon	G4
Bird	<i>Lanius ludovicia migrans</i>	Migrant loggerhead shrike	G5T3Q
Bird	<i>Thryomanes bewickii altus</i>	Appalachian Bewick's wren	G5T2Q
Crustacean	<i>Caecidotea carolinensis</i>	Bennett's Mill Cave water slater	G1G2
Crustacean	<i>Cambarus chaugaensis</i>	Oconee stream crayfish	G2
Crustacean	<i>Cambarus georgiae</i>	Little Tennessee River crayfish	G1
Crustacean	<i>Cambarus parrishi</i>	Hiwassee Headwaters crayfish	G1
Crustacean	<i>Cambarus reburrus</i>	French Broad crayfish	G3
Crustacean	<i>Stygobromus carolinensis</i>	Carolina seep scud	G1G2
Fish	<i>Etheostoma acuticeps</i>	Sharphead darter	G2G3
Fish	<i>Etheostoma collis</i>	Carolina darter	G3
Fish	<i>Etheostoma mariae</i>	Pinewoods darter	G3
Fish	<i>Etheostoma vulneratum</i>	Wounded darter	G3
Fish	<i>Percina burtoni</i>	Blotchside logperch	G2
Fish	<i>Percina macrocephala</i>	Longhead darter	G3
Fish	<i>Percina squamata</i>	Olive darter	G2
Insect	<i>Callophrys irus</i>	Frosted elfin	G3
Insect	<i>Cicindela ancocisconensis</i>	A tiger beetle	G3
Insect	<i>Hypochilus coylei</i>	A cave spider	G3?
Insect	<i>Hypochilus sheari</i>	A lampshade spider	G2G3
Insect	<i>Melanoplus divergens</i>	Divergent Melanoplus	G2G3
Insect	<i>Melanoplus serrulatus</i>	Serrulate Melanoplus	G1G3
Insect	<i>Nesticus cooperi</i>	Lost Nantahala Cave spider	G1?
Insect	<i>Nesticus crosbyi</i>	a cave spider	G1?
Insect	<i>Nesticus mimus</i>	Cave spider	G2
Insect	<i>Nesticus sheari</i>	Cave spider	G2?

Insect	<i>Nesticus silvanus</i>	Cave spider	G2?
Insect	<i>Scudderia septentrionalis</i>	Northern Bush Katydid	G3?
Insect	<i>Semiothisa fraserata</i>	Fraser Fir Angle	G2?
Insect	<i>Speyeria diana</i>	Diana fritillary	G3
Insect	<i>Speyeria idalia</i>	Regal fritillary	G3
Insect	<i>Trechus carolinae</i>	A ground beetle	G1?
Insect	<i>Trechus luculentus unicolor</i>	A ground beetle	G2T2?
Insect	<i>Trechus mitchellensis</i>	A ground beetle	G1?
Insect	<i>Trechus rosenbergi</i>	A ground beetle	G1?
Insect	<i>Trechus satanicus</i>	A ground beetle	G1?
Insect	<i>Trimerotropis saxatilis</i>	Rock-loving grasshopper	G2G3
Insect (aquatic)	<i>Gomphus diminutus</i>	Diminutive clubtail	G3
Insect (aquatic)	<i>Gomphus septima</i>	Septima's clubtail	G2
Insect (aquatic)	<i>Macromia margarita</i>	Mountain river cruiser	G2G3
Insect (aquatic)	<i>Ophiogomphus edmodo</i>	Edmund's snaketail	G1
Insect (aquatic)	<i>Ophiogomphus howei</i>	Pygmy snaketail	G3
Insect (aquatic)	<i>Ophiogomphus incurvatus</i>	Appalachian snaketail	G3
Mammal	<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat	G3G4
Mammal	<i>Microtus chrotorrhinus carolinensis</i>	Southern rock vole	G4T3
Mammal	<i>Myotis leibii</i>	Eastern small-footed bat	G3
Mammal	<i>Sorex palustris punctulatus</i>	Southern water shrew	G5T3
Mollusk	<i>Alasmidonta varicosa</i>	Brook floater	G3
Mollusk	<i>Elliptio roanokensis</i>	Roanoke slabshell	G2
Mollusk	<i>Fusconaia barnesiana</i>	Tennessee pigtoe	G2G3
Mollusk	<i>Helicodiscus triodus</i>	Tallus coil	G2
Mollusk	<i>Lasmigona holstomia</i>	Tennessee Heelsplitter	G3
Mollusk	<i>Pallifera hemphilli</i>	Black mantleslug	G3
Mollusk	<i>Paravitrea placentula</i>	Glossy supercoil	G3
Mollusk	<i>Ventridens coelaxis</i>	Bidentate dome	G3
Mollusk	<i>Villosa vaughaniana</i>	Carolina creekshell	G2
Nonvasc. Plant	<i>Acrobolbus ciliatus</i>	A liverwort	G3?
Nonvasc. Plant	<i>Aneura maxima</i> (= <i>A. sharpii</i>)	A liverwort	G1G2
Nonvasc. Plant	<i>Anzia americana</i>	A Foliose Lichen	G2
Nonvasc. Plant	<i>Aspiromitus appalachianus</i>	A Hornwort	G1
Nonvasc. Plant	<i>Bartramidula wilsonii</i>	Dwarf apple moss	G3?
Nonvasc. Plant	<i>Bazzania nudicaulis</i>	Bazzania moss	G2G3
Nonvasc. Plant	<i>Brachydontium trichodes</i>	Peak moss	G2
Nonvasc. Plant	<i>Bryocrumia vivicolor</i>	Gorge moss	G2
Nonvasc. Plant	<i>Buxbaumia minakatae</i>	Hump-backed Elves	G2G3
Nonvasc. Plant	<i>Campylopus paradoxus</i>	Paradoxical campylopus	G3?
Nonvasc. Plant	<i>Cephalozia macrostachya ssp australis</i>	A liverwort	G4T1
Nonvasc. Plant	<i>Cephaloziella massalongi</i>	A liverwort	G2G3
Nonvasc. Plant	<i>Cheilolejeunea evansii</i>	A liverwort	G1
Nonvasc. Plant	<i>Diplophyllum apiculatum</i> var. <i>taxifolioides</i>	A Liverwort	G5T1Q
Nonvasc. Plant	<i>Diplophyllum obtusatum</i>	A Liverwort	G2?
Nonvasc. Plant	<i>Ditrichum ambiguum</i>	Ambiguous ditrichum	G3?
Nonvasc. Plant	<i>Drepanolejeunea appalachiana</i>	A liverwort	G2?
Nonvasc. Plant	<i>Entodon concinnus</i>	Lime entodon	G4G5
Nonvasc. Plant	<i>Ephebe americana</i>	A Fructicose Lichen	G2G3
Nonvasc. Plant	<i>Fissidens appalachiensis</i>	Appalachian Pocket Moss	G2G3
Nonvasc. Plant	<i>Frullania appalachiana</i>	A Liverwort	G1?
Nonvasc. Plant	<i>Frullania oakesiana</i>	A liverwort	G3?
Nonvasc. Plant	<i>Homaliadelphus sharpii</i>	Sharp's homaliadelphus	G3
Nonvasc. Plant	<i>Hydrothyria venosa</i>	An aquatic lichen	G3
Nonvasc. Plant	<i>Hygrohypnum closteri</i>	Closter's brook-hypnum	G3
Nonvasc. Plant	<i>Hypotrachyna virginica</i>	A Foliose Lichen	G1G3
Nonvasc. Plant	<i>Lejeunea blomquistii</i>	A liverwort	G1G2
Nonvasc. Plant	<i>Leptodontium excelsum</i>	Grandfather Mountain leptodontium	G2
Nonvasc. Plant	<i>Leptohyemium sharpii</i>	Mount Leconte moss	G1
Nonvasc. Plant	<i>Lophocolea appalachiana</i>	A liverwort	G2
Nonvasc. Plant	<i>Mannia californica</i>	A Liverwort	G3?
Nonvasc. Plant	<i>Marsupella emarginata</i> var. <i>latiloba</i>	A Liverwort	G5T1T2
Nonvasc. Plant	<i>Megaceros aenigmaticus</i>	A hornwort	G2G3
Nonvasc. Plant	<i>Metzgeria fruticulosa</i> (= <i>M. temperata</i>)	A Liverwort	G2Q
Nonvasc. Plant	<i>Metzgeria furcata</i> var. <i>setigera</i>	A Liverwort	G4T1
Nonvasc. Plant	<i>Metzgeria uncigera</i>	A liverwort	G3

Nonvasc. Plant	<i>Pellia X appalachiana</i>	A liverwort	G1?
Nonvasc. Plant	<i>Physcia pseudospeciosa</i>	Rosette lichen	G1?
Nonvasc. Plant	<i>Plagiochasma intermedium</i>	A Liverwort	G3?
Nonvasc. Plant	<i>Plagiochasma wrightii</i>	A Liverwort	G3?
Nonvasc. Plant	<i>Plagiochila austinii</i>	A liverwort	G3
Nonvasc. Plant	<i>Plagiochila caduciloba</i>	A liverwort	G2
Nonvasc. Plant	<i>Plagiochila echinata</i>	A liverwort	G2
Nonvasc. Plant	<i>Plagiochila sharpii</i>	Sharp's leafy liverwort	G2G3
Nonvasc. Plant	<i>Plagiochila sullivantii var spinigera</i>	A liverwort	G2T1
Nonvasc. Plant	<i>Plagiochila sullivantii var sullivantii</i>	Sullivant's leafy liverwort	G2T2
Nonvasc. Plant	<i>Plagiochila virginica var caroliniana</i>	A liverwort	G3T2
Nonvasc. Plant	<i>Plagiochila virginica var virginica</i>	A liverwort	G3T3
Nonvasc. Plant	<i>Plagiomnium carolinianum</i>	Carolina plagiomnium	G3
Nonvasc. Plant	<i>Platyhypnidium pringlei</i>	Pringle's platyhypnidium	G2
Nonvasc. Plant	<i>Polytrichum appalachianum</i>	Appalachian haircap moss	G3
Nonvasc. Plant	<i>Porella japonica ssp appalachiana</i>	Appalachian porella	G5?T1
Nonvasc. Plant	<i>Porella wataugensis</i>	Watauga porella	G2
Nonvasc. Plant	<i>Porpidia diversa</i>	A crustose Lichen	G2G3
Nonvasc. Plant	<i>Porpidia herteliana</i>	A crustose Lichen	G2G3
Nonvasc. Plant	<i>Radula sullivantii</i>	A liverwort	G2
Nonvasc. Plant	<i>Radula voluta</i>	A liverwort	G3
Nonvasc. Plant	<i>Rhachithecium perpusillum</i>	Budding totula	G3?
Nonvasc. Plant	<i>Riccardia jugata</i>	A liverwort	G1G2
Nonvasc. Plant	<i>Schlotheimia lancifolia</i>	Highlands moss	G2
Nonvasc. Plant	<i>Scopelophila cataractae</i>	Agoyan cataract moss	G3
Nonvasc. Plant	<i>Sphagnum flavicomans</i>	A peatmoss	G3?
Nonvasc. Plant	<i>Sphenolobopsis pearsonii</i>	A liverwort	G2
Nonvasc. Plant	<i>Splachnum pennsylvanicum</i>	Pennsylvania dung moss	G2?
Nonvasc. Plant	<i>Sticta limbata</i>	A Foliose Lichen	G3G4
Nonvasc. Plant	<i>Taxiphyllum alternans</i>	Japanese yew-moss	G3?
Nonvasc. Plant	<i>Tortula ammonsiana</i>	Ammons' tortula	G2?
Nonvasc. Plant	<i>Xanthoparmelia monticola</i>	Xanthoparmelia lichen	G2
Vascular Plant	<i>Aconitum reclinatum</i>	Trailing white monkshood	G3
Vascular Plant	<i>Allium cuthbertii</i>	Striped garlic	G3
Vascular Plant	<i>Amorpha schwerinii</i>	Schwerin's false indigo	G3
Vascular Plant	<i>Arabis patens</i>	Spreading rockcress	G3
Vascular Plant	<i>Asplenium X ebenoides</i>	Scott's spleenwort	HYB
Vascular Plant	<i>Aster avitus</i>	Alexander's rock aster	G3
Vascular Plant	<i>Aster georgianus</i>	Georgia aster	G2G3
Vascular Plant	<i>Aster mirabilis</i>	Bouquet aster	G2G3
Vascular Plant	<i>Astragalus michauxii</i>	Sandhills milkvetch	G3
Vascular Plant	<i>Berberis canadensis</i>	American barberry	G3
Vascular Plant	<i>Botrychium jenmanii</i>	Dixie grapefern	G3G4
Vascular Plant	<i>Buckleya distichophylla</i>	Piratebush	G2
Vascular Plant	<i>Calamagrostis cainii</i>	Cain's reed grass	G1
Vascular Plant	<i>Cardamine clematidis</i>	Small mountain bittercress	G2G3
Vascular Plant	<i>Carex biltmoreana</i>	Stiff sedge	G3
Vascular Plant	<i>Carex communis var. amplisquama</i>	Fort Mountain sedge	G3
Vascular Plant	<i>Carex impressinervia</i>	Ravine sedge	G1G2
Vascular Plant	<i>Carex misera</i>	Wretched sedge	G3
Vascular Plant	<i>Carex radfordii</i>	Radford's sedge	G2
Vascular Plant	<i>Carex roanensis</i>	Roan sedge	G1
Vascular Plant	<i>Carex schweinitzii</i>	Schweinitz's sedge	G3
Vascular Plant	<i>Chelone cuthbertii</i>	Cuthbert's turtlehead	G3
Vascular Plant	<i>Cleistes bifaria</i>	Small spreading pogonia	G3G4
Vascular Plant	<i>Coreopsis latifolia</i>	Broadleaf tickseed	G3
Vascular Plant	<i>Coreopsis X delphiniifolia</i>	Larkspur Coreopsis	G3?Q
Vascular Plant	<i>Danthonia epilis</i>	Bog oat-grass	G3?
Vascular Plant	<i>Delphinium exaltatum</i>	Tall larkspur	G3
Vascular Plant	<i>Desmodium ochroleucum</i>	Cream tick-trefoil	G2G3
Vascular Plant	<i>Diervilla rivularis</i>	Riverbank bush-honeysuckle	G3
Vascular Plant	<i>Euphorbia purpurea</i>	Glade Spurge	G3
Vascular Plant	<i>Fothergilla major</i>	Large witchalder	G3
Vascular Plant	<i>Gentiana austromontana</i>	Appalachian gentian	G3
Vascular Plant	<i>Geum geniculatum</i>	Bent avens	G2
Vascular Plant	<i>Glyceria nubigena</i>	Great Smoky Mountain mannagrass	G2

Vascular Plant	<i>Grammitis nimbata</i>	West Indian polypody	G4?
Vascular Plant	<i>Hasteola suaveolens</i>	False Indian-plantain	G3
Vascular Plant	<i>Helianthus glaucophyllus</i>	Whiteleaf sunflower	G3
Vascular Plant	<i>Heuchera caroliniana</i>	Carolina Alumroot	G3
Vascular Plant	<i>Heuchera longiflora</i> var. <i>aceroides</i>	maple-leaf alumroot	G4T2Q
Vascular Plant	<i>Hexastylis contracta</i>	Mountain heartleaf	G3
Vascular Plant	<i>Hexastylis rhombiformis</i>	North Fork heartleaf	G2
Vascular Plant	<i>Hymenophyllum tayloriae</i>	Taylor's filmy fern	G1G2
Vascular Plant	<i>Hypericum graveolens</i>	Mountain St. Johnswort	G3
Vascular Plant	<i>Hypericum mitchellianum</i>	Blue Ridge St. Johnswort	G3
Vascular Plant	<i>Ilex collina</i>	Longstalked holly	G3
Vascular Plant	<i>Isoetes virginica</i>	Virginia quillwort	G1
Vascular Plant	<i>Juglans cinerea</i>	Butternut	G3G4
Vascular Plant	<i>Juncus caesariensis</i>	New Jersey Rush	G2
Vascular Plant	<i>Liatris turgida</i>	Shale-barren blazing star	G3
Vascular Plant	<i>Lilium grayi</i>	Gray's lily	G3
Vascular Plant	<i>Lindera subcoriacea</i>	Bog spicebush	G2
Vascular Plant	<i>Lotus helleri</i>	Heller's bird-foot trefoil	G3
Vascular Plant	<i>Lysimachia fraseri</i>	Fraser's yellow loosestrife	G2
Vascular Plant	<i>Malaxis bayardii</i>	Appalachian adder's-mouth	G2?
Vascular Plant	<i>Marshallia grandiflora</i>	Large-flowered Barbara's buttons	G2
Vascular Plant	<i>Marshallia trinervia</i>	Broadleaf Barbara's buttons	G3
Vascular Plant	<i>Monotropsis odorata</i>	Sweet Pinesap	G3
Vascular Plant	<i>Nartheceum americanum</i>	Bog Asphodel	G2
Vascular Plant	<i>Penstemon smallii</i>	Small's beardtongue	G3
Vascular Plant	<i>Plantahera integrilabia</i>	White Fringless Orchid	G2G3
Vascular Plant	<i>Poa paludigena</i>	Bog bluegrass	G3
Vascular Plant	<i>Prenanthes roanensis</i>	Roan Mountain rattlesnakeroot	G3
Vascular Plant	<i>Pycnanthemum beadleii</i>	Beadle's mountain mint	G2G4
Vascular Plant	<i>Pycnanthemum torrei</i>	Torrey's mountainmint	G2
Vascular Plant	<i>Rhododendron vaseyi</i>	Pinkshell azalea	G3
Vascular Plant	<i>Robinia viscosa</i>	Clammy locust	G3
Vascular Plant	<i>Robinia viscosa</i> var. <i>hartwegii</i>	Hartweg's locust	G3T1
Vascular Plant	<i>Rudbeckia triloba</i> var. <i>pinnatifida</i>	Pinnate-lobed black-eyed Susan	G4T2?
Vascular Plant	<i>Rugelia nudicaulis</i>	Rugel's Indianplantain	G3
Vascular Plant	<i>Sabatia capitata</i>	Appalachian rose gentian	G2
Vascular Plant	<i>Saxifraga caroliniana</i>	Carolina saxifrage	G2
Vascular Plant	<i>Scutellaria altamaha</i>	A skullcap	G2G3
Vascular Plant	<i>Scutellaria arguta</i>	hairy skullcap	G2?Q
Vascular Plant	<i>Scutellaria pseudoserrata</i>	A Skullcap	G3
Vascular Plant	<i>Scutellaria saxatilis</i>	Rock skullcap	G3
Vascular Plant	<i>Senecio millefolium</i> (<i>Packera millefolium</i>)	Divided-leaf ragwort, Piedmont ragwort	G2
Vascular Plant	<i>Shortia galacifolia</i> var. <i>brevistyla</i>	Northern Oconee bells	G2T1Q
Vascular Plant	<i>Shortia galacifolia</i> var. <i>galacifolia</i>	Southern Oconee bells	G2T2
Vascular Plant	<i>Silene ovata</i>	Mountain catchfly	G2G3
Vascular Plant	<i>Solidago plumosa</i>	Plumed goldenrod	G1
Vascular Plant	<i>Solidago simulans</i>	Fall goldenrod	G1
Vascular Plant	<i>Stachys clingmanii</i>	Clingman's hedge-nettle	G2Q
Vascular Plant	<i>Thalictrum macrostylum</i> (= <i>T. subrotundum</i>)	Piedmont meadowrue	G1G2Q
Vascular Plant	<i>Thaspium pinnatifidum</i>	Cutleaved meadow parsnip	G3?
Vascular Plant	<i>Thermopsis mollis</i> var. <i>fraxinifolia</i>	Ashleaf goldenbanner	G4?T3?
Vascular Plant	<i>Trillium rugelii</i>	Illscented trillium	G3
Vascular Plant	<i>Trillium simile</i>	Jeweled trillium	G3
Vascular Plant	<i>Tsuga caroliniana</i>	Carolina hemlock	G3
Vascular Plant	<i>Verbena riparia</i>	Riverbank vervain	G1G3
Vascular Plant	<i>Viola appalachensis</i>	Appalachian violet	G3
Vascular Plant	<i>Waldsteinia lobata</i>	Piedmont barren strawberry	G2

Global Rank: G1 = Extremely rare and critically imperiled; G2 = Very rare and imperiled; G3 = Rare and uncommon globally; G4 = Apparently secure globally; G5 = Demonstrably secure globally; G#? = Inexact numeric rank; G#Q = Questionable taxonomy; G#T# = Subspecific taxon rank; G1TX = Extremely rare and critically imperiled, probably extinct; GH = of historical occurrence throughout range.

EFFECTS

The proposed action involves amending the Nanthala/Pisgah Forest Plan to change the MIS list, change the list of species groups to be monitored, and associated wording changes in Forest Plan direction. This is a programmatic decision that does not involve ground disturbance. Current sampling protocols will not be changed, only the species analyzed as MIS. Some additional sampling protocols will be added for the additional species group monitoring to be done separate from the MIS requirements, but these would not remove specimens from the field. The Regional Forester's sensitive species, Carolina hemlock, will be retained as a MIS and will continue to be addressed in these capacities. The three endangered species (Indiana bat, Virginia big-eared bat, Northern flying squirrel) and the other sensitive species (Biltmore sedge, Wretched sedge, Carolina alumroot, maple-leaved alumroot, Carolina saxifrage, Peregrine falcon, Eastern small-footed bat, Rafinesque's big-eared bat and *Sphagnum flavicomans*) that are currently MIS as well are proposed to be removed from the MIS list and subsequent MIS analyses, but will still be addressed in BEs and monitored under the protocols of the TES species programs.

The Indiana bat, Virginia big-eared bat, Eastern small-footed bat, and Rafinesque's big-eared bat as well as all other bats, will continue to be monitored across the N/P as part of the overall Forest Plan LRMP monitoring plan. Also, the Forest Plan identified protection of caves to maintain these species when site-specific analysis indicates uniqueness of this habitat. Current and future management includes only activities that restore or maintain suitable habitat conditions for these species in caves.

The Northern Flying squirrel and Peregrine falcon will continue to be monitored in conjunction with the North Carolina Natural Resources Commission and the U.S. Fish and Wildlife Service. The Forest Service, in partnership with the state Natural Heritage Program, and other agencies and organizations, will continue to monitor and conserve special communities on the N/P such as rock outcrops that support the Biltmore sedge, Wretched sedge, Carolina alumroot, maple-leaved alumroot, and Carolina saxifrage. Also, the Forest Plan identified protection of rock outcrops to maintain these species when site-specific analysis indicates uniqueness of this habitat. Current and future management includes only activities that restore or maintain suitable habitat conditions for these species on rock outcrops.

The action of deleting certain TES that are also MIS will not impact any of these species. For each site-specific project on the Forest, a separate BE will still be prepared that will evaluate the effects to the TES having the potential to occur within any given project area.

DETERMINATION OF EFFECT

The action to modify the MIS list and expand the Forest Plan species group monitoring through the proposed N/P Amendment 17 will have: “No effect” on Threatened and Endangered species and “no impacts” on Sensitive Species that occur on the N/P. The proposed action will not result in a trend to federal listing or cause the loss of viability of any Sensitive species. Formal consultation with the USDI, Fish and Wildlife Service is not required.

s/s Steve A. Simon
STEVEN A. SIMON
Forest Ecologist / T&E Program Manager

January 13, 2005
Date

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APPENDIX B

PROPOSED CHANGES TO THE LIST OF MANAGEMENT INDICATOR SPECIES

MIS SPECIES in Alternative 1 (except for “New Selections”)	REASONS FOR RETENTION, NON-RETENTION, OR NEW SELECTION (Differences between Alt 2 and Alt 3 are noted)
Black Bear (<i>Ursus americanus</i>) Mammal	Retained because changes in presence and abundance of black bear will be used to help indicate effectiveness of management at maintaining old forest communities (100+ years old), contiguous forest areas with low levels of human disturbance (<1 mile open travelway/4 miles ²), and hard mast-producers.
Carolina Northern Flying Squirrel (<i>Glaucomys sabrinus coloratus</i>) Mammal	Not retained because Fraser fir is an adequate indicator of management effects to spruce-fir forest communities, since it is characteristic of the community and is directly impacted by management. Status of Carolina northern flying squirrel will continue to be monitored under the umbrella of the Endangered Species Act.
White-tailed Deer (<i>Odocoileus virginianus</i>) Mammal	Retained because changes in the abundance of white-tailed deer will help indicate the effectiveness of management at providing permanent grass-forb openings, and providing public opportunities for hunting. White-tailed deer is by far the species most in demand for hunting.
Raccoon (<i>Procyon lotor</i>) Mammal	Not retained because this species is more of a habitat generalist, rather than strictly riparian forest. Acadian flycatcher is an adequate indicator of riparian forests, is more strictly associated with riparian forests, and will be used to help indicate the effectiveness of management at maintaining riparian forests rather than the raccoon. Raccoon is also a demand species, and white-tailed deer is an adequate indicator for demand species.
Rabbit (<i>Sylvilagus spp.</i>) Mammal	Not retained because rufous-sided towhee is an adequate indicator for early successional habitat. Grass/forb openings will be analyzed as part of the habitat components for white-tailed deer and eastern wild turkey in Alternative 2. Rabbit is also a demand species, and white-tailed deer is an adequate indicator for demand species.
Gray Squirrel (<i>Sciurus carolinensis</i>) Mammal	Not retained because changes in the acres of mature oak forests will be more useful to indicate effectiveness of management at maintaining hard-mast production. Black bear would serve as an indicator for mast-producing species (Alts. 2 & 3), along with eastern wild turkey in Alternative 2. Gray squirrel is also a demand species, and white-tailed deer is an adequate indicator for demand species.
Bobcat (<i>Felis rufus</i>) Mammal	Not retained because rufous-sided towhee is an adequate indicator of early successional (0-10 years) habitat, and it will be used to help indicate the effectiveness of management at maintaining early successional (0-10 years) habitat rather than the bobcat. Bobcat is also a demand species, and white-tailed deer is an adequate indicator

MIS SPECIES in Alternative 1 (except for “New Selections”)	REASONS FOR RETENION, NON-RETENTION, OR NEW SELECTION (Differences between Alt 2 and Alt 3 are noted)
	for demand species.
Mink (<i>Mustela vison</i>) Mammal	Not retained because Acadian flycatcher is an adequate indicator of management effects to riparian forest communities, and it will be used to help indicate the effectiveness of management at maintaining riparian habitats rather than the mink. Mink is more difficult to monitor than Acadian flycatcher, Also, mink is a demand species and white-tailed deer is an adequate indicator for demand species.
Bats (Various species) Mammal	Not retained because multi-species assemblages are not appropriate for selection as MIS based on regulation language. However, bats as a group will be monitored as a part of the overall Forest Plan monitoring plan to evaluate diversity, distribution, and to detect the presence of Threatened, Endangered, and Sensitive species. Bats were originally selected as an indicator for caves. The Forest Plan identifies protection of caves when site-specific analysis indicates uniqueness of this habitat. Current and future management includes only activities that restore or maintain suitable habitat conditions for cave-related species.
Pileated Woodpecker (<i>Dryocopus pileatus</i>) Bird	Retained because changes in presence and abundance of pileated woodpecker will be used to help indicate effectiveness of management at maintaining snags. It is a primary excavator of fairly large diameter trees and is easily monitored.
Golden-crowned Kinglet (<i>Regulus satrapa</i>) Bird	Not retained because Fraser fir is an adequate indicator of spruce-fir, and will be used to help indicate the effectiveness of management at maintaining fir-dominated communities at high elevations rather than the golden-crowned kinglet. Fraser fir is more characteristic of the community and more directly impacted by management.
Veery (<i>Catharus fuscescens</i>) Bird	Not retained because the ovenbird is an adequate indicator of large contiguous areas of mature deciduous forests, and will be used to help indicate the effectiveness of management at maintaining these conditions rather than the veery. Veery is more likely to be found in large contiguous forest areas at higher elevations whereas ovenbird is equally likely to be found at all elevations.
Solitary (Blue headed) Vireo (<i>Vireo solitarius</i>) Bird	Not Retained because ramps is an adequate indicate effectiveness of management at maintaining northern hardwood forest communities, and solitary vireo is more of a habitat generalist, being more of an elevational associate than a forest type associate. Ramps is highly associated with northern hardwoods and can be directly impacted from management.
Northern Parula Warbler (<i>Parula americana</i>) Bird	Not retained because the ovenbird is an adequate indicator of large contiguous areas of mature deciduous forests, and will be used to help indicate the effectiveness of management at maintaining these conditions rather than the northern parula warbler. Northern parula is

MIS SPECIES in Alternative 1 (except for “New Selections”)	REASONS FOR RETENION, NON-RETENTION, OR NEW SELECTION (Differences between Alt 2 and Alt 3 are noted)
	more likely to be found in forest patches associated with riparian habitat, whereas ovenbird is equally likely to be found in large contiguous forest areas regardless of proximity to water.
Ovenbird (<i>Seiurus aurocapillus</i>) Bird	Retained because changes in presence and abundance of ovenbird will be used to help indicate effectiveness of management at maintaining large contiguous areas of mature deciduous forests. Ovenbird can be found in large contiguous forest areas of all kinds.
Yellow-Bellied Sapsucker (<i>Sphyrapicus varius</i>) Bird	Not retained because the pileated woodpecker is an adequate indicator of snags, and will be used to help indicate the effectiveness of management at maintaining snags rather than the yellow-bellied sapsucker. Yellow-bellied sapsucker is most abundant along streams in mixed hardwood/conifer forests, whereas pileated woodpecker is found more widely across the Forests.
Rufous-Sided (Eastern) Towhee (<i>Pipilo erythrophthalmus</i>) Bird	Retained because changes in the presence and abundance of rufous-sided towhee will be used to help indicate the effectiveness of management at maintaining early successional (0-10 years) habitat. Towhee is strongly associated with brushy areas and is easily monitored.
White-breasted Nuthatch (<i>Sitta carolinensis</i>) Bird	Not retained because the pileated woodpecker is an adequate indicator of snags and dens, and will be used to help indicate the effectiveness of management at maintaining snags rather than the white-breasted nuthatch. Pileated’s behavior as a primary excavator of cavities that can be used by other species weighed into its selection as an MIS over white-breasted nuthatch.
Cedar Waxwing (<i>Bombycilla cedrorum</i>) Bird	Not retained because the ruffed grouse is an adequate indicator of soft mast production, and will be used to help indicate the effectiveness of management at maintaining soft mast production rather than the cedar waxwing. Waxwings consume soft mast primarily in winter; whereas, ruffed grouse use soft mast year-round.
Pine Warbler (<i>Dendroica pinus</i>) Bird	Retained because changes in presence and abundance of pine warbler will be used to help indicate effectiveness of management at maintaining xeric yellow pine forest communities. Pine warbler is strongly associated with mature pine habitat.
Raven (<i>Corvus corax</i>) Bird	Not retained because the Forest Plan identifies protection of open rock outcrops to maintain this species when site-specific analysis indicates uniqueness of this habitat. Current and future management includes only activities that restore or maintain suitable habitat conditions for this species on open rock outcrops.
Field Sparrow (<i>Spizella pusilla</i>) Bird	Not retained because rufous-sided towhee is an adequate indicator of early successional (0-10 years) habitat, and it will be used to help indicate the effectiveness of management at maintaining early successional (0-10years) habitat rather than the field sparrow. Field sparrow is more associated with open fields and hedgerows, while

MIS SPECIES in Alternative 1 (except for “New Selections”)	REASONS FOR RETENION, NON-RETENTION, OR NEW SELECTION (Differences between Alt 2 and Alt 3 are noted)
	towhee is more associated with brushy areas typical of early successional habitats managed on the Forests.
Eastern Wild Turkey (<i>Meleagris gallopavo</i>) Bird	Retained in Alternative 2 because changes in presence and abundance of eastern wild turkey will be used to help indicate effectiveness of management at providing public opportunities for hunting. Grass/forb openings and hard mast will be analyzed as habitat components necessary for maintaining eastern wild turkey. Not retained in Alternative 3 to reduce redundancy in indicators of permanent grass/forb, and hard mast.
Ruffed Grouse (<i>Bonasa umbellus</i>) Bird	Retained because changes in presence and abundance of ruffed grouse will be used to help indicate effectiveness of management at maintaining early successional (11-20 years) habitat, downed woody debris, soft mast producing species, as well as providing public opportunities for hunting.
Peregrine Falcon (<i>Falco peregrinus</i>) Bird	Not retained because the Forest Plan identifies protection of open rock outcrops to maintain this species when site-specific analysis indicates uniqueness of this habitat. Current and future management includes only activities that restore or maintain suitable habitat conditions for this species on open rock outcrops.
Eastern Meadowlark (<i>Sturnella magna</i>) Bird	Not retained because grass/forb openings will be analyzed as a part of the habitat components necessary to maintain white-tailed deer and eastern wild turkey (Alternative 2). Eastern meadowlark is more associated with large agricultural fields rather the types of habitat found on the Forests
Acadian Flycatcher (<i>Empidonax virescens</i>) Bird	New Selection. Changes in presence and abundance of Acadian flycatcher will be used to help indicate effectiveness of management at maintaining riparian forest. It is strongly associated with riparian forests and is easily monitored.
Green Salamander (<i>Aneides aeneus</i>) Amphibian	Not retained because the Forest Plan identifies protection of shaded rock outcrops to maintain this species when site-specific analysis indicates uniqueness of this habitat. Current and future management includes only activities that restore or maintain suitable habitat conditions for this species on shaded rock outcrops. However, salamanders as a group will be monitored as a part of the overall Forest Plan monitoring plan to evaluate diversity, habitat relationships, and forestwide distribution.
Jordan’s Salamander (<i>Plethodon jordani</i>) Amphibian	Not retained because the Forest Plan identifies protection of shaded rock outcrops to maintain this species when site-specific analysis indicates uniqueness of this habitat. Current and future management includes only activities that restore or maintain suitable habitat conditions for this species on shaded rock outcrops. However, salamanders as a group will be monitored as a part of the overall Forest Plan monitoring plan to evaluate diversity, habitat

MIS SPECIES in Alternative 1 (except for “New Selections”)	REASONS FOR RETENION, NON-RETENTION, OR NEW SELECTION (Differences between Alt 2 and Alt 3 are noted)
	relationships, and forestwide distribution.
Spotted Salamander (<i>Ambystoma maculatum</i>) Amphibian	Not retained because the Forest Plan identifies protection of mountain ponds and ephemeral pools to maintain this species when site-specific analysis indicates uniqueness of this habitat. Current and future management includes only activities that restore or maintain suitable habitat conditions for this species in mountain ponds and ephemeral pools. However, salamanders as a group will be monitored as a part of the overall Forest Plan monitoring plan to evaluate diversity, habitat relationships, and forestwide distribution.
Blue Ridge Two-lined Salamander (<i>Eurycea wilderae</i>) Amphibian	Not retained because this salamander is more of a habitat generalist, being found near any permanent water but wandering far into mesic forests. Acadian flycatcher is an adequate indicator of riparian forests, and it will be used to help indicate the effectiveness of management at maintaining riparian forests rather than the Blue Ridge two-lined salamander. However, salamanders as a group will be monitored as a part of the overall Forest Plan monitoring plan to evaluate diversity, habitat relationships, and forestwide distribution.
Brook Trout <i>Salvelinus fontinalis</i> (a fish)	Not retained in Alternative 2 – see Wild Trout below. Retained as “wild brook trout” in Alternative 3 to indicate the effects of management on a portion of cold water streams.
Brown Trout <i>Salmo trutta</i> (a fish)	Not retained in Alternative 2 – see Wild Trout below. Retained as “wild brown trout” in Alternative 3 to indicate the effects of management on a portion of cold water streams.
Rainbow Trout <i>Oncorhynchus mykiss</i> (a fish)	Not retained in Alternative 2 – see Wild Trout below. Retained as “wild rainbow trout” in Alternative 3 to indicate the effects of management on a portion of cold water streams.
Wild Trout (fish) Brook trout (<i>Salvelinus fontinalis</i>), Brown Trout (<i>Salmo trutta</i>), and Rainbow Trout (<i>Oncorhynchus mykiss</i>)	New Selection in Alternative 2 to indicate effects of management on species associated with cold water streams. The brook trout (<i>Salvelinus fontinalis</i>) is the only salmonid (trout and charr) species native to the Southern Appalachians and is generally considered to be pollution intolerant and an important water quality indicator. High quality habitat contains abundant macroinvertebrates for food, boulder-cobble stream bottoms with developed pockets of clean gravel for spawning, and water temperatures 68° or less. Brown and rainbow trout require similar habitat conditions and, while not native to North Carolina, are valuable components of coldwater ecosystems. Wild trout populations include all native or naturalized trout populations, relying solely on natural reproduction for recruitment. Wild trout populations do not include those augmented with catchable (>= 7” total length) or fingerling-sized (< 7” total

MIS SPECIES in Alternative 1 (except for “New Selections”)	REASONS FOR RETENION, NON-RETENTION, OR NEW SELECTION (Differences between Alt 2 and Alt 3 are noted)
	length) trout, where natural reproduction is not sufficient to sustain the population.
Blacknose Dace <i>Rhinichthys atratulus</i> (a fish)	Retained to represent lower trophic levels of coldwater streams. The blacknose dace (<i>Rhinichthys atratulus</i>) is a non-game fish that is generally considered to be pollution intolerant and an important water quality indicator. High quality habitat contains abundant macroinvertebrates for food and cobble and gravel substrate with little sedimentation. Blacknose dace require clean, well-oxygenated water with moderate flow. It inhabits some stream reaches not inhabited by trout.
Sculpin <i>Cottus spp</i> (fish)	Not retained because blacknose dace adequately serves to indicate the effects of management on this trophic level. Additionally, sculpin do not occur in Atlantic slope drainages, which includes parts of three ranger districts.
Smallmouth Bass <i>Micropterus dolomieu</i> (a fish)	Retained to help indicate the effects of management on lower-elevation cool- and warmwater stream communities. Smallmouth bass (<i>Micropterus dolomieu</i>) are an important game fish and are found in all major cool- and warmwater streams across the Forests. It inhabits streams with permanent flow and rocky bottoms, and is considered intolerant of high turbidity and sedimentation.
Largemouth Bass <i>Moctopterus salmoides</i> (a fish)	Retained to indicate the effects of management on lakes, ponds, and reservoirs. It is an important species for recreational fisheries, as well as a reliable indicator of lake, reservoir, and pond habitat quality and quantity.
Bluegill <i>Lepomis macrochirus</i> (a fish)	Not retained because largemouth bass serves as an adequate indicator of the effects of management on lake, reservoir, and pond systems. Somewhat better information is available for largemouth bass, which was factored into its selection as an MIS instead of bluegill.
White sucker <i>Catostomus commersoni</i> . (a fish)	Not retained because the species is generally tolerant of degraded environmental conditions. Additionally, forest-wide IBI surveys capture information on this species, as well as the general health of cool- and warmwater streams.
Redhorse suckers <i>Moxostoma spp.</i> (a fish)	Not retained because members of this group of fishes have been found to be endemic to specific drainages, and are not representative of cool- or warmwater streams in general. The relative rarity of several redhorse species, and difficulty with effective sampling of larger streams make it difficult to determine population levels of effects of management on population levels. Additionally, forest-wide IBI surveys capture information on this species, as well as the general health of cool- and warmwater streams.
Spotfin Chub <i>Cyprinella</i>	Not retained because smallmouth bass serves as an adequate indicator of the effects of management on warmwater streams. The

MIS SPECIES in Alternative 1 (except for “New Selections”)	REASONS FOR RETENION, NON-RETENTION, OR NEW SELECTION (Differences between Alt 2 and Alt 3 are noted)
<i>monacha</i> (a fish)	range and distribution of the species is severely limited, the majority of which does not occur on the Forests. This factor makes it not effective as an indicator of the effects of management.
Aquatic Invertebrates (various)	Not retained because multi-species assemblages are not appropriate for selection as MIS based on regulation language. However, aquatic invertebrates as a group will be monitored as a part of the overall Forest Plan monitoring plan to evaluate stream health and diversity.
Index of Biotic Integrity (IBI)	Not retained because this is a protocol and not a species, and as such is not appropriate for selection as an MIS. IBI will continue to be developed as a tool for evaluating the health of cool- and warmwater streams.
Freshwater mussels (various)	Not retained because multi-species assemblages are not appropriate for selection as MIS based on regulation language. However, freshwater mussels as a group will to be monitored as a part of the overall Forest Plan monitoring plan to evaluate diversity, distribution, and to detect the presence of Threatened, Endangered, and Sensitive species.
Fraser fir (<i>Abies fraseri</i>) Tree	Retained. Changes in presence and abundance of Fraser fir in the Spruce-Fir zone will be used to help indicate effectiveness of management at maintaining fir dominated communities at high elevations. It is characteristic of the community and directly impacted by management.
Carolina hemlock (<i>Tsuga caroliniana</i>) Tree	Retained. Changes in presence and abundance of Carolina hemlock will be used to help indicate effectiveness of management at maintaining Carolina hemlock bluffs. It is characteristic of the community and may be directly impacted by management.
Ginseng (<i>Panax quinquefolium</i>) Herb	Retained. Changes in presence and abundance of American ginseng will be used to help indicate effectiveness of management at maintaining mixed mesophytic plant communities, i.e. rich coves, and for maintaining sustainable ginseng harvests. It is strongly associated with rich coves and can show the effects of management.
Ramps (<i>Allium tricoccum</i>) Herb	New Selection. Changes in presence and abundance of ramps will be used to help indicate effectiveness of management at maintaining northern hardwood forest communities, and for maintaining sustainable ramp harvests. It is strongly associated with the community and can show the effects of management.
Red oak (<i>Quercus rubrum</i>) Tree	Retained in Alternative 2. Changes in presence and abundance of red oak will be used to help indicate effectiveness of management at maintaining oak-hickory plant communities and high elevation red oak plant communities. It was selected in part due to it being directly impacted by management. Not retained in Alternative 3 , in favor of adding “oak plant communities” to the species groups to be

MIS SPECIES in Alternative 1 (except for “New Selections”)	REASONS FOR RETENTION, NON-RETENTION, OR NEW SELECTION (Differences between Alt 2 and Alt 3 are noted)
	monitored separate from MIS.
Mountain oat-grass (<i>Danthonia compressa</i>) Grass	Not Retained. Forest Plan identifies protection of grassy balds and open rock outcrops to maintain this species when site-specific analysis indicates uniqueness of these plant community types. Current and future management includes only activities that restore or maintain suitable habitat conditions for this species on grassy balds and on open rock outcrops.
Catawba rhododendron (<i>Rhododendron catawbiense</i>) Shrub	Not Retained. Forest Plan identifies protection of heath balds to maintain this species when site-specific analysis indicates uniqueness of this plant community type. Current and future management includes only activities that restore or maintain suitable habitat conditions for this species on heath balds.
Golden saxifrage (<i>Chrysosplenium americanum</i>), umbrella leaf (<i>Diphylia cymosa</i>), mountain lettuce (<i>Saxifraga micranthidifolia</i>) Herbs	Not Retained. Forest Plan identifies protection of forested seep wetlands to maintain this species when site-specific analysis indicates uniqueness of this plant community type. Current and future management includes only activities that restore or maintain suitable habitat conditions for these species in wetlands, i.e. maintaining natural hydrologic condition.
Prairie dropseed (<i>Sporobolus heterolepis</i>), slender wheatgrass (<i>Elymus trachycaulus</i>)	Not Retained. Forest Plan identifies protection of barrens and glades to maintain this species when site-specific analysis indicates uniqueness of this plant community type. Current and future management includes only activities that restore or maintain suitable habitat conditions for these species in barrens and glades.
Alumroots, saxifrages	Not- Retained. Forest Plan identifies protection of shaded rock outcrops to maintain this species when site-specific analysis indicates uniqueness of this plant community type. Current and future management includes only activities that restore or maintain suitable habitat conditions for these species on shaded rock outcrops.
Biltmore sedge (<i>Carex biltmoreana</i>), wretched sedge (<i>Carex misera</i>) Sedges	Not Retained. Forest Plan identifies protection of open rock outcrops to maintain this species when site-specific analysis indicates uniqueness of this plant community type. Current and future management includes only activities that restore or maintain suitable habitat conditions for these species on open rock outcrops.
Sphagnum spp.	Not Retained. Forest Plan identifies protection of mountain bogs to maintain this species when site-specific analysis indicates uniqueness of this plant community type. Current and future management includes only activities that restore or maintain suitable habitat conditions for species in wetlands, i.e. maintaining natural

MIS SPECIES in Alternative 1 (except for “New Selections”)	REASONS FOR RETENION, NON-RETENTION, OR NEW SELECTION (Differences between Alt 2 and Alt 3 are noted)
	hydrologic condition.
White Oak (<i>Quercus alba</i>), Hickory spp (<i>Carya spp.</i>). Trees	Not Retained. For Alternative 2, red oak is an adequate indicator of management in oak forests and oak-hickory forests. For Alternative 3, “oak plant communities” would be added to the species groups to be monitored separate from MIS.
Black cherry (<i>Prunus serotina</i>) Tree	Not Retained. Black cherry is a habitat generalist, and ginseng is an adequate indicator of management in rich cove forests.
Basswood (<i>Tilia americana</i>), Buckeye (<i>Aesculus flava</i>) Trees	Not Retained. Ginseng is an adequate indicator of management in rich cove forests. Buckeye and basswood are not exclusively associated with rich coves. Ginseng is closely associated with rich coves and is clearly affected by management.
Twisted stalk (<i>Streptopus roseus</i>) Herb	Not Retained. Ramps is an adequate indicator of management in northern hardwood forests. Twisted stalk is uncommon and not abundant when found, making it ineffective as an ecological indicator for northern hardwood forests.
Pitch pine (<i>Pinus rigida</i>), Table Mt. Pine (<i>Pinus pungens</i>), Turkey beard (<i>Xerolhyllum asphodeliodes</i>) 2 Trees & an Herb	Not Retained. Pine warbler is an adequate indicator of management in xeric yellow pine forests. None of the three plants is associated with all xeric yellow pine communities, whereas the pine warbler is. Pine-oak heaths (habitat for pitch pines and Table Mt. pines) will be monitored , not as MIS, but as a part of the overall Forest Plan monitoring plan to evaluate changes in community composition and structure.
Lung lichen (<i>Lobaria pulmonaria</i>) Lichen	Not Retained. Black bear is an adequate indicator of management in old forests. Lung lichen has been found to be less strongly associated with old forest communities than was previously thought to be the case.
Grapes (<i>Vitus spp.</i>) Vine	Not Retained. Grapes is a multi-species assemblage and therefore inappropriate as MIS. Also, the amount of vines is not necessarily indicative of the availability of soft mast, since fruiting is abundant only in certain situations. Ruffed grouse is an adequate indicator of management of soft mast-producing species.
White pine (<i>Pinus strobes</i>) Tree	Not Retained. The species is a habitat generalist and there is disagreement among the scientific community concerning the validity of this taxon, i.e. a white pine ‘natural community’ in the Southern Appalachians.
Exotic species: Japanese honeysuckle, <i>Microstegium</i> , privet, periwinkle	Not Retained. Multi-species assemblages are not appropriate for selection as MIS based on regulation language. However, exotic species as a group will continue to be monitored as part of the overall Forest Plan monitoring plan.

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APPENDIX C
SUMMARIZED SCOPING COMMENTS AND AGENCY RESPONSES

Comment: We support the amendment, as it will streamline the process and reduce red tape.

Response: Thank you for your support.

Comment: The proposed language change drops reference to maintaining viability.

Response: The viability language would not be removed with this amendment. This was a misinterpretation that has been clarified.

Comment: The requirement of maintenance of “viable populations” of wildlife species should be removed. Protections are already in place to identify species whose populations are endangered, threatened, or of special concern.

Response: This is outside the scope of this amendment.

Comment: Rare habitats should be periodically assessed.

Response: We agree that rare habitats should be periodically assessed. We hope to convene a small working group this summer along with other interested parties to generate ideas and discuss options for doing this in a collaborative manner.

Comment: What will be the tie between species group monitoring and project level design or analysis? Monitoring of species groups for documentation in the annual Monitoring and Evaluation Report would not serve as a comparable monitoring to directly tie monitoring results to the design of projects.

Response: With this amendment, project monitoring would not change. Projects are typically designed to implement overall goals and objectives of the forest plans. Project monitoring evaluates how well the project achieves these goals and objectives while complying with forest plan standards.

MIS analysis at the project level involves evaluating the likely implications of changes to the habitat from project implementation to the forest-wide MIS population trends. MIS population trends are evaluated at the forest-wide level, and that information is appropriately presented in the Annual M&E Report, just as is the species group information. With this amendment, the difference would be a shorter list of MIS and a longer list of species groups.

If monitoring a species group uncovers a concern with a particular component or components of the ecosystem that can be impacted by management (positively or negatively), that information can be elevated and incorporated into future project designs.

Comment: Monitoring species groups is a logical and economic method of evaluation and will provide worthwhile data that can be used to assess ecological health.

Response: Thank you for your support of this component of the plan amendment.

Comment: We are concerned that the species groups to be monitored do not clearly represent all the major habitat types.

Response: We believe that the species group monitoring, when combined with the special habitat monitoring and the retained MIS framework will provide information on all the major habitat types.

Comment: Is it not redundancy to take limited resources to monitor game species that are already monitored by the state?

Response: Our intent is not to duplicate monitoring, but rather take advantage of monitoring done by other entities.

Comment: We would encourage significantly reducing or eliminating the “sensitive species” lists.

Response: This is outside the scope of this plan amendment. The sensitive species list is developed by the Regional Forester.

Comment: What assurances does the public have that analysis resources will be better utilized under this new amendment? Will these resources go towards improving analyses for endangered, threatened, and sensitive species?

Response: We will still be analyzing impacts to the appropriate MIS at the project level. By shortening the list we reduce the redundancy in the analysis. We will continue to analyze impacts to forest communities. Analysis of impacts to TES species will continue to be carried out as appropriate and some analysis resources may be freed up to develop better habitat management proposals for TES and other species.

Comment: Having three game species is redundant.

Response: We agree that deer, turkey, and grouse do use some of the same habitat elements and could be viewed as redundant. Public and agency interest in these species is a factor in their retention in Alternative 2. Alternative 3 eliminates eastern wild turkey from the retained MIS. This leaves white-tailed deer as the primary game species retained. Ruffed grouse is still retained in Alternative 3; while also a game species, it is an indicator of a somewhat different habitat from white-tailed deer.

Comment: We support maintaining the white-tailed deer as an MIS.

Response: Thank you for your support.

Comment: What will be the design of the permanent plots for species group monitoring? Will they be kept separate from management activities?

Response: For several of these groups, a standardized protocol has already been in place for some time. For those groups that do not have an established protocol in place we will

develop one as we work through the amendment process. We agree that areas where management activities have taken place should be monitored as well as similar habitats in unmanaged landscapes as a part of the design.

Comment: We disagree that interest in hunting some game species is lower than in the past. Demand is lower because lack of early successional habitats has led to lower populations of species like quail and rabbits.

Response: We agree that hunting of some game species is lower than in the past not because of less interest, but because of a decline in habitat supporting those species. We will clarify our reasoning for not retaining some game species to reflect this.

Comment: We don't agree that redundancy in indicators is inherently a bad thing. Is one species sufficient for evaluating the management of a specific habitat type?

Response: We agree that redundancy is not inherently a bad thing. However, our desire to reduce redundancy in the MIS list is based on the need to make the most efficient use of limited resources. We also agree that one species may not be sufficient for evaluating the management of a specific habitat type. Our view is that it would be more meaningful to evaluate the condition of the habitat itself, rather than just several individual species. Limiting the list of species that need to be analyzed in our project NEPA documents should allow us to focus more clearly on the overall condition of the habitat itself.

Comment: Our concern is that this change would result in an increased flow of project proposals which involve activities that create significant impacts to forest ecology.

Response: This amendment would not change the fact that all projects must comply with NEPA and the Forest Plan to determine if a significant ecological impact may occur. Changing the MIS list does not reduce or eliminate this requirement. We believe the major noticeable change from reducing the list will be a reduction in the redundancies of analysis currently found in our NEPA documents.

Comment: We suggest retaining Carolina northern flying squirrel or another high elevation species to monitor spruce-fir communities.

Response: The Forest Plan requires that prior to implementation of a project above 4000 feet we monitor Carolina northern flying squirrel nest boxes for two years or trap for three years. So, while not included in the MIS retained under this amendment, monitoring will still occur according to other Plan direction. We will continue to collaborate with the State and National Park Service in determining the extent of potential northern flying squirrel habitat and use of that habitat.

Comment: For spruce-fir forest, a more sensitive indicator such as one or more of the bryophytes specific to fir bark may be more appropriate than Fraser-fir. Golden-crowned kinglet may be an important supplement and community level monitoring would be appropriate.

Response: We believe that Fraser fir is an appropriate indicator for spruce-fir forest, being directly representative of the character of the community. Also, we are impacting

the Fraser fir through our management, since we allow seedling sales. MIS are intended to be indicators of the effects of management, and we are directly managing this species. It is also a species essential to the integrity of the community; therefore, it seems a logical choice as a management indicator. We will continue our breeding bird surveys in the spruce-fir zone that will pick up golden-crowned kinglets. However, this is separate from the MIS framework and is intended to discern broad scale population trends.

Comment: Use of the entire guild of hole-nesting species from the forest bird monitoring would provide better information on the abundance and quality of snags.

Response: We agree that information from the breeding bird surveys could be useful in evaluating the abundance and quality of snags. However species groups are inappropriate for selection as MIS, and those surveys are done outside the MIS framework. Pileated woodpecker, retained on the MIS list as an indicator of snags, is a primary excavator and uses fairly large (22" dbh avg.) trees. It is fairly easy to monitor its population trend. This makes it an appropriate indicator for evaluating implementation of our minimum management requirements for snags (retaining all den trees \geq 22 dbh, and retaining 2 snags per acre in harvest units).

Comment: Rufous-side towhee is not an adequate substitute for field sparrow.

Response: We agree that rufous-sided towhee is not a substitute for field sparrow. However we believe rufous-side towhee is the more appropriate choice for the intended purpose of MIS – to evaluate the effects of our management. Both field sparrow and rufous-sided towhee are indicators of early successional habitat (0-10 years old), but field sparrow is more associated with old field habitat – not a condition we necessarily manage for. According to Paul Hamel (1992) field sparrow tends to use scattered saplings or shrubs in weedy habitats such as overgrown fields, woods margins, hedgerows and thickets. Resident birds tend to be associated more with open fields during the winter. Rufous-sided towhees are very widespread and are found in brushy places in all seasons. They tend to inhabit woodland margins, thickets, woodland understory and cutover areas. This latter habitat is more indicative of areas that are actively managed through activities such as timber harvest.

Comment: More emphasis should be given to how community monitoring for Pine-Oak/Heath will be an adequate substitute for pine warbler.

Response: We recognize that pine warbler can be found in all pine types and are not specific to pine-oak heath. Since pine-oak heath is a community we want to actively restore, we have selected the pine-oak heath community for special monitoring outside the MIS process. Pine-oak heath would be included in Table D-3, species groups to be monitored. Some initial ideas for methodology are being pulled together and will be discussed within our working group this summer.

Comment: Wild trout need to be retained as three separate species.

Response: We have developed Alternative 3 which retains the wild trout as three separate species.

Comment: Ginseng is an important species to monitor, but buckeye and/or basswood would offer perhaps a better perspective on rich cove forest in general.

Response: Rich cove forests will be monitored as a group outside the MIS process. This monitoring will add substantially to the overall perspective on rich cove forest in general. While buckeye and basswood are typically found in rich coves forests, our data clearly shows that ginseng is an excellent indicator of the integrity of rich cove forests, and the population is responsive to management, both characteristics desired for selection as MIS.

Comment: Using ramps appears to leave the majority of northern hardwood forest acreage without specific monitors.

Response: The majority of management within the northern hardwood zone occurs in the northern hardwood forests found in higher elevation cove environments where ramps typically occur. The northern hardwood slopes or beech gap communities are predominantly outside the suitable timber base and are seldom impacted by our management. Since ramps is typically found in the northern hardwood types we typically manage, is responsive to management, and is an excellent indicator of the integrity of these forest types, we believe it the appropriate choice as northern hardwood MIS.

Comment: We would suggest either having white oak and chestnut oak as MIS as well as red oak, or creating a monitoring group for oaks in general.

Response: We agree that oaks are an especially important component of the mountain forests and warrant close attention. Oak regeneration is a major focus of our management activities and therefore, effects to the oak community should be addressed in project analyses. General information regarding the amount and distribution of oaks is regularly available from Forest Inventory and Analysis data. Alternative 3 adds the oak plant community to the proposed species group monitoring.

Comment: Black bear are not a good substitute for what is being monitored by lung lichen.

Response: We surveyed a number of sites and found that lung lichens are found in both mid-seral and late-seral stands and are not closely tied to old growth stands as was believed in the past. It is unclear that our management impacts population trends, which is a factor in the selection of MIS. Old, mature stands are a needed component of black bear habitat to provide secure denning sites, and black bear concurrently is an indicator of large contiguous forest areas with low levels of human disturbance. We believe these factors make black bear an appropriate selection as MIS.

Comment: Monitoring exotic species outside of the MIS structure seems appropriate. If being on the MIS list would offer more attention, it would be appropriate to include a couple of the most serious invaders as individual species. Microstegium, tree of heaven, and Japanese honeysuckle would probably be most appropriate.

Response: We believe monitoring non-native invasive species outside the MIS structure is much more effective and meaningful, and can bring more attention to treatment. Inclusion of non-native invasive species as one of the Four Threats identified by the Forest Service as focal points for management has done much more to focus attention on addressing the problems than having them as an MIS ever did.