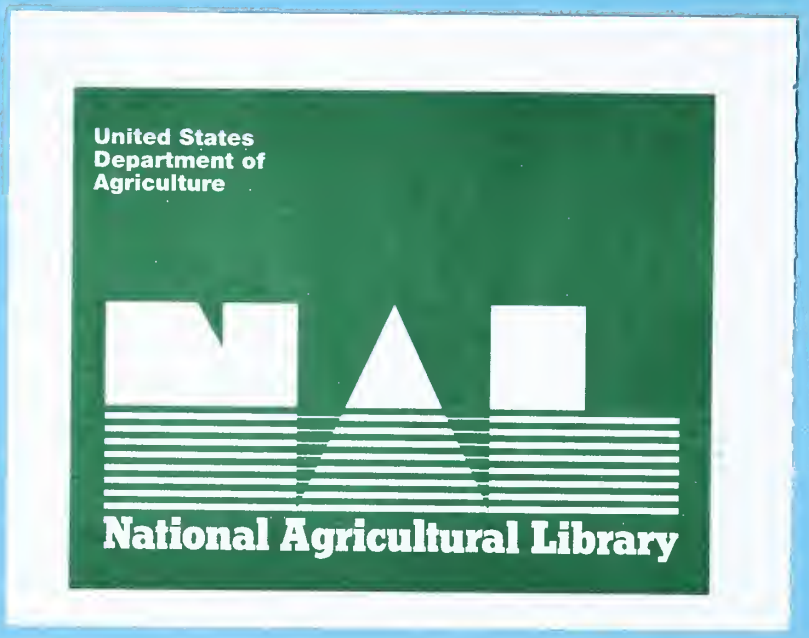
FINAL ENVIRONMENTAL IMPACT STATEMENT
FOR
THREATENED AND ENDANGERED SPECIES
ON THE
ALLEGHENY NATIONAL FOREST

July 2000

Allegheny National Forest
P. O. Box 847, 222 Liberty Street
Warren, PA 16365



FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THREATENED AND ENDANGERED SPECIES ON THE ALLEGHENY NATIONAL FOREST

Elk, Forest, McKean and Warren Counties, PA

JULY 2000

Lead Agency: USDA-Forest Service, Allegheny National Forest

Responsible Official: John E. Palmer, Forest Supervisor
Allegheny National Forest
P. O. Box 847
Warren, PA 16365
(814) 723-5150

For further information, contact: Gary W. Kell, Forest Planner
Allegheny National Forest
P. O. Box 847
Warren, PA 16365
(814) 723-5150

Abstract: Eight alternatives for the management and enhancement of Threatened and Endangered (T&E) Species on the Allegheny National Forest (ANF) are described and evaluated in an Environmental Impact Statement. Three alternatives are considered in detail while five alternatives are considered but not analyzed in detail. The alternatives analyzed in detail are:

1) Alternative 1, the Proposed Action - Amends the Forest Plan standards and guidelines and the monitoring plan to reflect new information such that adequate protection is given to T&E Species and their habitats. Zebra mussel screening and decontamination procedures will be implemented at Forest Service boat launch facilities.

2) Alternative 2, Close Boat Launches - Amends the Forest Plan standards and guidelines and the monitoring plan to reflect new information such that adequate protection is given to T&E Species and their habitats. Forest Service boat launch facilities will be closed to stem the introduction of Zebra mussels.

3) Alternative 3, No Action - Does not amend the Forest Plan; existing standards and guidelines and other administrative actions will be relied upon to provide for the needs of T&E Species.

Six issues were identified by reviewing public and agency comments, the Biological Assessment for Threatened and Endangered Species on the Allegheny National Forest (12/98), the US Fish and Wildlife Service Biological Opinion, and various laws and regulations. Alternatives developed to address the issues were analyzed to determine the effects of implementation on various resource elements of the Forest Plan. The deciding officer is the Forest Supervisor of the ANF who chose Alternative 1 for implementation. The Forest Supervisor's decision is appealable per 36 CFR 217.9 and 217.9 regulations. Appeals must be filed within 45 days following the publication of the legal notice announcing the decision in the Warren Times Observer.

SUMMARY

FEDERAL DECISION TO BE MADE

The decision to be made is to determine what changes are needed in existing Allegheny National Forest Land and Resource Management Plan (Forest Plan) standards and guidelines (S&G's) and monitoring requirements based upon new information and requirements regarding five Federally-listed threatened and endangered species (T&E species) found on or near the Allegheny National Forest (ANF). These changes will be documented in the format of a Forest Plan amendment.

PURPOSE AND NEED

The purpose of this analysis is to: 1) identify how new information and requirements pertaining to the four T&E species contained within the USDI Fish and Wildlife Service Biological Opinion (BO), and the five species contained within the Conservation Program for T&E Species on the Allegheny National Forest (ANF CP) (Appendix A) affect the implementation of the Forest Plan; and 2) identify what changes are needed in current Forest Plan standards and guidelines and monitoring requirements. These five threatened or endangered species are known to occur on or near the ANF: Bald eagle, Indiana bat, Clubshell mussel, Northern Riffleshell mussel, and Small whorled pogonia

PROPOSED ACTION

The proposed action is to amend the Forest Plan by revising three S&G's and adding twelve new S&G's. The reference to Bald eagle is dropped from one S&G and one S&G is dropped. Forty-one other S&G's relating to T&E species' needs will remain unchanged. The Monitoring Plan included in Appendix B of the Forest Plan will be modified by revising monitoring requirements for the Bald eagle and adding monitoring requirements for the Indiana bat, Clubshell mussel, Northern Riffleshell mussel and Small whorled pogonia.

BACKGROUND

Consultation History

ANF and FWS personnel have been involved in informal consultation and information exchange since the approval of the Forest Plan in 1986. The ANF has responded to new information or the completion of informal consultation by initiating surveys or by including additional documentation in Biological Evaluations (BE) or Environmental Assessments (EA), as appropriate.

Since June 1999, there has been ongoing, informal consultation between ANF and FWS personnel to integrate the requirements of the BO with ANF projects. This includes consultation on ongoing ANF projects, on the development of the Zebra mussel action plan and other actions outlined in the BO.

New Species Information

Since approval of the Forest Plan in 1986, new information regarding T&E species has become available and the T&E species list for the Allegheny National Forest has changed. The current T&E species list for the ANF includes Bald eagle, Indiana bat, Clubshell mussel, Northern Riffleshell mussel and Small whorled pogonia.

Summary of Background Information

The discovery of and response to new information related to five Federally-listed threatened or endangered species is in full compliance with the requirements of the ESA:

- Formal consultation was completed as part of the development of the Forest Plan.

- Informal consultation was an ongoing process between 1986 and 1998.
- Formal consultation was initiated with FWS in 1998.
- FWS personnel issued a Biological Opinion in June 1999.
- ANF personnel developed the ANF Conservation Program. It was presented to FWS as part of consultation that is ongoing.

The requirements contained within the BO and the ANF Conservation Program were reviewed to determine appropriate disposition for implementation. Some items are best addressed by modifying or adding to the standards and guidelines and modifying Forest Plan monitoring requirements. In accordance with NFMA, an amendment to the Forest Plan is appropriate.

SCOPING

Scoping is the process used to determine the significant issues that are related to the proposed action. Scoping was initiated with the publication of a Notice of Intent to Prepare an Environmental Impact Statement (NOI) in the Federal Register on February 8, 1999. Eleven letters were received in response to scoping efforts and were reviewed by the Interdisciplinary Team (ID Team). The ID Team also considered comments developed from reviewing the Forest Plan records, the Biological Opinion, and input from ANF resource specialists. A summary of these comments is found in Appendix C.

DEVELOPMENT OF THE PROPOSED ACTION

The proposed action was developed by examining the Forest Plan, the BO, the ANF Conservation Program, and scoping comments to determine which items would be most appropriately addressed by amending the Forest Plan. This resulted in some changes and refinements in the proposed action as described in the Notice of Intent.

The first step was to examine the Forest Plan to determine what existing management direction pertains to T&E species. The second step was to examine the findings of the BO and determine what kind of action is needed in order to meet the requirements found in the BO. The third step was to compare Forest Plan S&G's with the elements of the ANF CP (Appendix A). The fourth step was to review comments received in scoping to see if additions to the proposed action should be made. And the final step was to write the new S&G's included in the proposed action.

DEVELOPMENT OF ALTERNATIVES

The first step taken by the ID team in the development of alternatives was to identify environmental and social issues related to the proposed action. These issues were developed by analyzing the comments received through scoping (Appendix C), by addressing management concerns, by considering information contained in the BO, and by analyzing the comments received in response to the Draft EIS. The ID Team also considered the requirements of NEPA, NFMA and ESA in this process.

Summary of Issues Used to Formulate Alternatives

The ID Team identified six issues that were used to formulate alternatives.

1. Provide management direction that minimizes take for Indiana bat, Bald eagle, Clubshell mussel and Northern Riffleshell mussel.
2. Reduce the risk of jeopardy for the Northern Riffleshell mussel by minimizing the risk of introduction of Zebra mussels at Forest Service boat launching facilities on the Allegheny River and Allegheny Reservoir.

3. Maintain recreational boating facilities and opportunity for associated activities on the Allegheny River and Allegheny Reservoir.
4. Broaden the scope of the analysis to include alternatives that emphasize/prioritize T&E species by modifying current even-aged vegetative management practices to uneven-aged management or zero cut.
5. Broaden the scope of the analysis to include alternatives that emphasize/prioritize T&E species through the establishment of special protection areas or the designation of seasonal management periods.
6. Broaden the scope of the analysis to include needed Forest Plan changes to address needs of sensitive species.

Brief Description of Alternatives

Eight alternatives, including the proposed action, have been developed. Alternatives 1, 2 and 3 were considered in detail, Alternatives 4-8 were considered but eliminated from detailed study.

Alternative 1 - The Proposed Action: Amends Forest Plan standards and guidelines related to five T&E species. The purpose of these changes is to ensure that the Forest Plan reflects the requirements of the BO and the additional measures outlined in the ANF CP so that Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. Recreational boating opportunities will continue to be provided. Zebra mussel screening and decontamination procedures designed to protect populations of Clubshell mussel and Northern Riffleshell mussel will be implemented. These procedures are outlined in the Zebra Mussel Action Plan in the ANF CP. This plan is subject to periodic modification by agreement with the FWS. Decontamination information will be available for boaters. The monitoring plan will be amended to modify monitoring requirements for Bald eagle and to include monitoring requirements for four additional T&E species.

Alternative 2 - Close Boat Launches: Amends Forest Plan standards and guidelines related to five T&E species to ensure that Forest Plan S&G's reflect the requirements of the BO and the additional measures outlined in the ANF CP so that Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. Forest Service boat launches on the Allegheny River and Allegheny Reservoir will be closed. Eliminating the possibility of Zebra mussel introduction from Forest Service boat launches on the Allegheny River and Allegheny Reservoir will protect T&E mussels. The monitoring plan will be amended to modify monitoring requirements for Bald eagle and to include monitoring requirements for four additional T&E species.

Alternative 3 - No Action: Does not amend the Forest Plan. Existing standards and guidelines and other administrative actions will be relied upon to provide for T&E species' needs. No new standards and guidelines will be adopted. The monitoring plan will remain unchanged.

Alternative 4 - Zero Cut: Amends Forest Plan standards and guidelines related to five T&E species to ensure that Forest Plan S&G's reflect the requirements of the BO and the additional measures outlined in the ANF CP so that Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. In addition, Forest Plan objectives and outputs will be modified to remove commercial timber harvest activities. The monitoring plan will be amended to modify monitoring requirements for Bald eagle and to include monitoring requirements for four additional T&E species.

Alternative 5 - Uneven-age Emphasis: Amends Forest Plan standards and guidelines related to five T&E species to ensure that Forest Plan S&G's reflect the requirements of the BO and the additional measures outlined in the ANF CP so Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. In addition, Forest Plan objectives and outputs will be modified to replace even-age silvicultural objectives and outputs with uneven-age objectives and outputs. The monitoring plan will be amended to modify monitoring requirements for Bald eagle and to include monitoring requirements for four additional T&E species.

Alternative 6 – Special Protection Areas: Amends Forest Plan standards and guidelines related to five T&E species to ensure that Forest Plan S&G's reflect the requirements of the BO and the additional measures outlined in the ANF CP so Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. In addition, Forest Plan objectives will be modified to include special protection areas for T&E species. The monitoring plan will be amended to modify monitoring requirements for Bald eagle and to include monitoring requirements for four additional T&E species.

Alternative 7 – Seasonal Management Periods: Amends Forest Plan standards and guidelines related to five T&E species to ensure that Forest Plan S&G's reflect the requirements of the BO and the additional measures outlined in the ANF CP so Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. This alternative includes additional S&G's that would impose seasonal restrictions on management activities that result in disturbance to Indiana bat such as logging, tree removal for road and motorized trail construction, and site clearing for special use permits. The monitoring plan will be amended to modify monitoring requirements for Bald eagle and to include monitoring requirements for four additional T&E species.

Alternative 8 – Consideration of Sensitive Species: Amends Forest Plan standards and guidelines related to five T&E species to ensure that Forest Plan S&G's reflect the requirements of the BO and the additional measures outlined in the ANF CP so Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. The monitoring plan will be amended to modify monitoring requirements for Bald eagle and to include monitoring requirements for four additional T&E species.

Alternatives 1, 2 and 3 will be considered in detail. Alternatives 4 through 8 were considered but eliminated from detailed study after careful evaluation determined further analysis of these five alternatives was not needed.

COMPARISON OF ALTERNATIVES CONSIDERED IN DETAIL

The six issues identified for this analysis will be used as a basis for the comparison of Alternatives 1, 2 and 3. The following table shows how each alternative responds to the issues.

Comparison of Issues by Alternative

Issues	Alt. 1	Alt. 2	Alt. 3
1 - Minimize Take of T&E Species	Y	Y	N
2 - Reduce Risk of Jeopardy to Northern Riffleshell mussel	Y	Y	N
3 - Maintain Recreational Boating Opportunities	Y	N	Y
4 - Broaden the Scope – Zero cut and Uneven-age Mgt	N	N	N
5 – Broaden the Scope – Special Protection and Seasonal Mgt	N	N	N
6 – Broaden the Scope – Sensitive Species	N	N	N

Alternative 1 responds to issues #1, 2 and 3. Alternative 1 minimizes take of T&E species by amending Forest Plan S&G's in accordance with direction provided in the BO. Risk of jeopardy to Northern Riffleshell mussel is reduced by implementing the Zebra mussel action plan. Recreational boating opportunities continue to be provided at Forest Service facilities on the Allegheny Reservoir and Allegheny River. Alternative 1 does not increase the scope of analysis over what is outlined in the purpose and need for this EIS.

Alternative 2 responds to issues #1 and 2. Alternative 2 minimizes take of T&E species in the same way as described for Alternative 1. Risk of jeopardy to Northern Riffleshell mussel is eliminated from Forest Service boat launches on the Allegheny Reservoir and Allegheny River by the closure of these facilities.

Forest Service recreational boating opportunities would no longer be offered in this alternative. Alternative 2 does not increase the scope of analysis over what is outlined in the purpose and need for this EIS.

In Alternative 3, the take of T&E species is not minimized, because all the terms and conditions specified in the BO are not made a part of the Forest Plan. Some protection of T&E species is provided through implementation of existing S&G's. The continued existence of Bald eagle, Indiana bat, and Clubshell mussel is not jeopardized by implementation of the Forest Plan. There is no change in the risk of jeopardy to the Northern Riffleshell mussel from Forest Service facilities as no change in procedures would occur at Forest Service boat launches on the Allegheny Reservoir or Allegheny River. Recreational boating opportunities continue to be provided at Forest Service facilities on the Allegheny Reservoir and Allegheny River. Alternative 3 does not increase the scope of analysis over what is outlined in the purpose and need for this EIS.

AFFECTED ENVIRONMENT

Physical Characteristics

Forest Location

The ANF is located in Northwestern Pennsylvania in Elk, Forest, McKean, and Warren Counties and has 513,127 acres, including water area. Approximately 13 percent of the ANF (65,271 acres) is found within watersheds that are not impounded, that drain into the Allegheny River.

The National Forest is located within a day's drive of: Cleveland, OH; Pittsburgh and Philadelphia, PA; Washington, DC; and New York, NY. Principal access routes are Interstate 79 from the south and Interstates 80 and 90 and U.S. Route 6 from the north, east and west.

The four-county area that includes the Allegheny National Forest is rural, with forested land averaging about 95 percent. Farmlands and small towns are at scattered locations.

Roads

There are 1,139 miles of Forest Service-managed roads on the ANF. These roads are managed as either open full-time (38%), seasonally open (25%), or closed (37%). In addition to ANF roads, there are 758 miles of state and township roads, 620 miles of roads which are not managed by the ANF that support private oil, gas, and mineral (OGM) developments, 67 miles of jointly managed roads (by the ANF and OGM companies) and 30 miles of roads managed under special use permit by private parties other than OGM-related developments.

There are 92.8 miles of roads managed by the ANF found within lands that drain directly into the Allegheny River.

Water Quality

The ANF is located in a region of abundant water, with annual precipitation of about 42 inches and runoff of 21 inches. The available water supply exceeds domestic, commercial, and industrial needs currently and into the foreseeable future. Water supply and water quality are adequate for Bald eagle, Indiana bat, Clubshell mussel and Northern Riffleshell mussel.

The ANF is dissected by hundreds of miles of perennial and intermittent streams. These streams provide cold, clean water to the larger stream systems such as the Allegheny and Clarion Rivers. Overall, water quality of streams in the ANF is good, meeting State standards.

There are a number of impoundments located on the ANF, ranging in size from 1 acre to 7,783 acres.

Within the 13 percent subsection of the ANF that flows directly into the Allegheny River, there are approximately 161 miles of cold, headwater streams. These streams range in size from small first order streams to the larger East Hickory Creek drainage.

The most current data on the surveyed streams was collected between 1974 and 1999. Based on a review of this data, all the streams have good water quality and meet State water quality standards. Each of the streams is cold-water and supports various fish species that inhabit cold-water environments. Because of the streams' locations on the landscape (unglaciated), they can be characterized as infertile mountain streams with little buffering capacity.

Oil, Gas and Minerals (OGM)

The ANF lies in the heart of the oil and gas-producing region of northwest Pennsylvania. Currently there are approximately 6,000 active, producing wells on the ANF. Approximately 93 percent of the subsurface mineral rights are privately owned (either outstanding or reserved rights).

Soils

Soils on the ANF were formed in residual, colluvial, and alluvial materials that were derived primarily from shales and sandstones which date back to the Pennsylvanian, Mississippian, and Devonian periods of geologic history. These rock formations are almost entirely of sedimentary origin and very strongly acid,

There are many S&G's that apply to soil resources designed to minimize the potential for soil erosion (Forest Plan, pp. 4-19 through 4-29).

BIOLOGICAL CHARACTERISTICS

Vegetation

Pennsylvania contains about 17 million acres of forestland, with sawtimber stands comprising 54 percent of these lands (Alerich, 1993a). Forested conditions are found on 95 percent of the ANF's 513,127 acres, 78 percent of which is sawtimber sized and older than 60 years of age. Several distinct forest types are present on the ANF including Allegheny hardwoods (Black cherry, white ash and yellow poplar), northern hardwoods (American beech, sugar maple, yellow birch and hemlock), upland hardwoods (mixture of red maple, Black cherry, black birch, yellow poplar, white ash, basswood and cucumber), and the oak type.

The ANF is part of a larger forested landscape within Pennsylvania. Forest cover is abundant on the ANF for the species discussed in this analysis, with close to 95 percent of the ANF in a forested condition. This far exceeds the HSI model (Romme *et al.,* 1995) thresholds for suitable habitat for Indiana bat (5% forest cover) and optimum habitat (30 % forest cover).

Wildlife Habitat

The diversity of wildlife is dependent upon the diversity of available wildlife habitat. These habitats are a combination of successional stages and vegetation types (cover types).

The vegetation structure in a forest can greatly influence wildlife use and abundance. A forest with a diverse understory, mid-story and overstory will support a diverse assemblage of wildlife. On the ANF, past and present deer populations have had a major impact on the diversity of vegetation. Diverse understories of hobblebush, maple-leaf viburnum, Canada yew, and other palatable shrubs and wild flowers have been replaced by monocultures of New York and hay-scented fern, striped maple, and beech (Jones *et al.,* 1993). High deer populations have an adverse impact on species richness of intermediate-canopy songbirds (deCalesta, 1994). Studies in progress on the ANF show the importance of these diverse understories to wildlife. About 60 wildlife species utilize herbaceous shrubs, and 40 species prefer a dominant deciduous shrub component (Linda Ordiway, pers. comm.). Half of the ANF has understories where vegetative diversity has been diminished and ferns are dominant (USDA-FS, 1991).

Wildlife species richness is influenced by forest successional stages. Early successional forests (seedling and sapling habitat, 0-19 years old) occur on about seven percent of the ANF. About 30 species utilize seedling/sapling habitat exclusively, while another 150 species utilize a combination of mature and regenerating forest communities for feeding and reproduction (DeGraaf *et al.,* 1992). Mature forests (50-109 years old) occur on about 84 percent of the ANF and are utilized exclusively by about 10 wildlife species while another 160 species utilize a mature forest in combination with other successional stages (DeGraaf *et al.,* 1992). Late-successional/old growth forests occur on about 1.5 percent of the ANF.

Management Indicator Species

The management indicator species (MIS) approach provides the basis for analysis of effects to all wildlife species that utilize the ANF without the complexity of addressing each species individually. Thirteen wildlife and three fish species representing a variety of habitats were selected to monitor trends in habitat capability (Forest Plan EIS, p. 3-22).

Federally Proposed, Endangered, or Threatened Species and Regionally Sensitive Species

The Federally Proposed, Threatened, or Endangered Species and Regionally Sensitive Species List (PETS species) for the ANF includes 31 species (Table 21). A detailed discussion of the 31 species and an analysis of potential impacts associated with the alternatives proposed in this document are addressed in the Biological Assessment for Forest Plan Amendment #11 Threatened and Endangered Species Allegheny National Forest (Appendix D). The only terrestrial sensitive species that could be adversely affected by the proposed action is the Northern long-eared bat.

Aquatic Resources

The ANF provides suitable habitat for a variety of cold, cool, and warm-water species of fish. There are 71 species of native and wild fish that have been documented within the ANF. Game fish include species of trout, bass, walleye, muskellunge, and others, and many more non-game fish including species of darters, dace, minnows, and others.

Aquatic insect surveys have been conducted across the ANF in numerous headwater streams by several agencies and entities. The result of these surveys show there is good aquatic insect diversity, with a number of pollution sensitive species (e.g. stonefly, mayfly, caddis fly) present.

The Allegheny River provides suitable habitat for the two Federally endangered freshwater mussels, the Clubshell mussel (*Pleurobema clava*) and the Northern Riffleshell mussel (*Epioblasma torulosa rangiana*).

One of the biological concerns related to continued existence of Clubshell mussel and Northern Riffleshell mussel populations in the Allegheny River is the potential introduction of the Zebra mussel, an exotic species, into waters in and around the ANF. Zebra mussels can interfere with the normal activity (feeding, respiration, and locomotion) of native mussels.

SOCIAL/ECONOMIC CHARACTERISTICS

Recreation Resources

The ANF provides a full spectrum of recreation facilities and opportunities, with approximately 3.9 million recreation visitor days reported in 1998 (1 recreation visitor day (RVD) = 12 hours of use by one person). The recreation resources most pertinent to this analysis are those related to power boating and canoeing that occur on the Allegheny Reservoir and Allegheny River, and trail systems located within the 13 percent subsection.

Recreation Facilities

The Allegheny Reservoir is a focal point for the most highly developed recreation facilities found on the ANF. The 16 developed sites along the reservoir range in character from semi-primitive to highly developed. Boating, fishing, and water play are major recreation activities that occur at the reservoir. There are eight boat launches (two with fishing piers) and one full service marina that provide water access. In addition, there are many associated facilities including five picnic areas, two beaches and two overlooks.

ANF facilities along Allegheny River corridor are operated by ANF personnel and include the Buckaloons campground, picnic area, and boat launch and the Tidioute overlook and picnic area.

A highly developed trail system including non-motorized and motorized trails is found on the ANF.

Recreation Use

The recreation use related to this analysis is displayed in the following table.

Recreation Visitor Days by Activity, 1998

Activity	RVD's* (entire ANF)	Allegheny Reservoir RVD's	Allegheny River RVD's
Mechanized Travel and Viewing Scenery (Includes Boating)	1,805,000	1,245,500	108,300
Camping, Picnicking, Swimming	1,032,000	774,400	82,400
Hunting, Fishing	369,000	169,700	68,900
Other (Hiking, Canoeing, Nature Study, Gathering Forest Products)	700,000	254,600	132,200
TOTALS	3,906,000	2,444,200	391,800

1 RVD = 12 hours of use by one person

Economics

The ANF provides direct opportunity for employment for many local people including timber operators, oil and gas developers, construction contractors, and recreation providers. There are also indirect employment opportunities created by increases in the economy through the services provided to recreation users (i.e., gas stations, restaurants, etc.) and secondary wood processing facilities. In addition to jobs, recreation use brings additional dollars into the local economy that adds to its health and well being.

Economics Related to Recreation Use

Recreation use and associated revenues may be affected by the proposals in this Forest Plan amendment. Estimates of revenues generated by the local economy are directly related to the number of RVD's that occur on the ANF each year. By applying the multiplier coefficients generated in the Forest Plan analysis to 1998 RVD data we estimate that recreation use adds about $2,480,000 dollars annually to the local economy per each million RVD's of use.

Timber Harvest Values

Timber harvest values are very high on the ANF, primarily due to the exceptional quality of Black cherry. Between 1991 and 1997, the total annual value of timber sales awarded through the competitive bidding process has ranged from $17 million to $29 million, with an average annual value of $21 million.

Both the Clubshell mussel and Northern Riffleshell mussel have been found in the Allegheny River near the ANF Wilderness Islands and other locations in the designated reaches.

ENVIRONMENTAL CONSEQUENCES

Physical Characteristics

Roads

In summary, there could be negligible impacts to road management and road construction practices as a result of S&G's proposed in Alternatives 1 and 2. The changes that would occur are minor and, when considered at the programmatic level, result in virtually no change to effects previously discussed in the Final Environmental Impact Statement (FEIS) prepared for the Forest Plan (FEIS, pp. 4-30 through 4-37), i.e., Alternative 3 in the current analysis.

Water Quality

In summary, the S&G's proposed in Alternatives 1 and 2 would result in no direct or indirect changes to water quality above those already described in the current Forest Plan FEIS (pp. 4-20, 34, 35, 50, 58, 59, 78-82). In Alternative 3, S&G's designed to minimize the risk of introduction of Zebra mussels are not implemented. As a result, it is possible that there could be an indirect effect on water quality. Infestations of Zebra mussel in the Allegheny Reservoir could affect water clarity and alter the chemical make-up of water. It is unclear what affect Zebra mussels would on water quality in the Allegheny River

BIOLOGICAL CHARACTERISTICS

Vegetation

Forest Type - In summary, S&G's 1 through 15 proposed in Alternatives 1 and 2 would result in no changes in forest type from what would occur in Alternative 3.

Forest type distribution, whether as a result of natural processes or management actions, is not affected In Alternative 3 no new S&G's would be added to the Forest Plan therefore no effects to forest type would occur.

Age class distribution is not affected by S&G's 1 through 15 as proposed in Alternatives 1 and 2, and would result in no change in age class distribution from what would occur in Alternative 3. At the programmatic level, these S&G's do not limit final harvest activity.

The effects of implementing Alternative 3 are the same as those in Alternatives 1 and 2, no affect on age-class distributions.

Forest Vegetation and Habitat for Threatened and Endangered Species

In summary, some difference in forest vegetation could occur as a result of implementation of S&G's proposed in Alternatives 1 and 2 from what would occur in Alternative 3. There could be minor differences in habitat for Bald eagle, and no change to habitat for Clubshell mussel or Northern Riffleshell mussel under any alternative. In Alternatives 1 and 2, effects could be anticipated with respect to the distribution of live and dead trees. In Alternative 3, no new S&G's would be added to the Forest Plan, therefore no new effects to the T&E species would occur above and beyond those discussed in the Forest Plan FEIS.

ANF Harvest Treatments and Harvest Volumes

In summary, compared with the current situation, there are negligible impacts to harvest treatments and perhaps minor impacts on harvest volumes as a result of S&G's proposed in Alternatives 1 and 2. When considered at the programmatic level, there is virtually no change to effects previously discussed in the Forest Plan FEIS (pp. 4-15 through 4-30 and 4-43). These S&G's are not included in Alternative 3 therefore the alternative would not have an effect on harvest treatments and volumes.

Reforestation

In summary, there are negligible impacts to current reforestation practices resulting from new S&G's proposed in Alternatives 1 and 2. When considered at the programmatic level, there is virtually no change to effects previously discussed in the Forest Plan FEIS (pp. 4-37 through 42) or in the amendment that addresses understory vegetation management (USDA-FS, 1991, pp. 4-1 through 4-25). Reforestation practices would continue as described in the Forest Plan FEIS.

Wildlife Habitat

Composition and Structure of Communities

Alternatives 1 and 2 contain S&G's 1 through 5 which are designed to protect adequate numbers of super-canopy white pine and other large trees in areas where Bald eagles are likely to nest and roost. This would have a relatively minor impact on the conifer or riparian community type structure, compared to the structure that would be achieved under guidance in the Forest Plan, because the Forest Plan calls for little harvesting in these portions of the ANF.

Proposed S&G's 6 through 11 included in Alternatives 1 and 2 modify requirements for retaining dead and live trees following different kinds of timber harvests and for retaining 50 percent minimum canopy closure following partial harvests. Existing S&G's in Alternative 3 place similar tree retention requirements in harvest areas. It is anticipated that S&G's 6 through 12 would have insignificant impact on conifer and riparian community types as limited amounts of timber harvest occurs in these areas and existing S&G's already specify similar residual tree requirements.

In Alternatives 1 and 2, proposed S&G 12 establishes the requirement to protect roost trees. It is conceivable that a roost tree could be discovered within either of these communities; the roost tree would be protected, but there would be a negligible effect on these community types.

Management Indicator Species

In summary, compared with the current situation, there may be minor impacts to habitat for several management indicator species (pileated woodpecker, red-shouldered hawk, barred owl, and yellow-bellied sapsucker) as a result of S&G's proposed in Alternatives 1 and 2. Habitat for other management indicator species discussed in Chapter 3 would not be affected. When considered at the programmatic level, there is virtually no change to effects previously discussed in the FEIS (FEIS, pp. 99 through 103). Alternative 3 could have minor effects to walleye and smallmouth bass in the reservoir and river.

Federally Proposed, Endangered, or Threatened Species and Regionally Sensitive Species

The discussion on sensitive species that follows will pertain to the Northern long-eared bat for proposed standards and guidelines that affect terrestrial habitats and to the aquatic fauna (1 mussel, 9 dragonflies and 7 fish) for actions associated with aquatic and riparian habitats. Other sensitive species are not impacted by the proposed action. A detailed analysis of effects is contained in Appendix D.

Proposed S&G's 1 through 5 included in Alternatives 1 and 2 modify existing requirements for buffer zones surrounding Bald eagle nests (both active and inactive), identify types of individual trees to be retained for future habitat needs, and provide protection for roost areas. These S&G's would result in no change in habitat for the Northern long-eared bat.

Neither the proposed nor existing S&G's are expected to have any effect on the Northern long-eared bat.

Proposed S&G's 6 through 10 included in Alternatives 1 and 2 modify requirements for retaining dead and live trees following different kinds of timber harvests. Existing S&G's in Alternative 3 place similar requirements in all harvest areas. These S&G's assure that minimum numbers of dead and live trees will be found following timber harvest. Incidental take is minimized, and habitat is maintained.

Comparable improvements in habitat for Northern long-eared bat could occur as a result of implementing proposed S&G's 8 through 12. Larger roost trees would be provided following timber harvests.

In Alternative 1, S&G 14 requires that screening and decontamination procedures be implemented at Forest Service boat launch facilities on the Allegheny Reservoir and Allegheny River in order to reduce the risk of Zebra mussel introduction from Forest Service facilities in these waters. In Alternative 2, S&G 14 closes these facilities, thereby eliminating the risk of Zebra mussel introduction from Forest Service facilities in these waters. In both cases, risk of Zebra mussel introduction is not reduced for the numerous private and other public boat launches. In Alternative 3, implementation of measures to prevent the introduction of Zebra mussel does not occur. In Alternatives 1 and 2, risk of infestation on the Allegheny River system is reduced due to actions taken at Forest Service launch sites.

Alternative 3 does not require signing, decontamination of boats, or boat launch closures. This alternative has the highest potential for allowing the introduction of Zebra mussels into the reservoir and river from ANF boat launches. Thus, any effects to the sensitive fish species, sensitive dragonflies, or the Long-solid mussel are greatest in this alternative.

Aquatic Resources

In summary, S&G's 1 through 13 included in Alternatives 1 and 2 would have a negligible effect on aquatic resources beyond those effects already described in the current Forest Plan (FEIS, pp. 4-20, 34, 35, 50, 58, 59, 78-82), i.e., Alternative 3. Alternatives 1 and 2 provide different techniques designed to help prevent Zebra mussels from colonizing the Allegheny River and Allegheny Reservoir from ANF boat launches. They both significantly reduce the risk of colonization due to introduction from Forest Service sites from that inherent in Alternative 3, which employs no such techniques.

For Alternative 3, without any restrictions on boats launching from ANF sites, the possibility of Zebra mussel introduction is greatest. Should Zebra mussels get introduced into the reservoir, an immediate source of veligers would be present that could get flushed into the river and populate suitable sites. This alternative resulted in a jeopardy determination by the FWS for the Northern Riffleshell mussel.

SOCIAL/ECONOMIC CHARACTERISTICS

Recreation Resources

In summary, there are negligible impacts to recreation resources as a result of S&G's proposed in Alternatives 1 and 3. The changes that would occur are quite minor in nature, and when considered at the programmatic level, result in virtually no change to effects previously discussed in the Forest Plan FEIS (pp. 4-8 through 15, 23, 36, 44, 47, 53, 57, 60, 114-119), i.e., Alternative 3 in the current analysis. Alternative 2 results in considerable impact to recreation users as a result of S&G 14. ANF boat access facilities would no longer be open along the Allegheny Reservoir and Allegheny River. Significant reductions in total recreation visitor days (RVD's) could occur, as well as reductions in total recreation revenues.

Recreation Use

In summary, the S&G's proposed in Alternative 1 would result in comparable recreation use and effects as described in the Forest Plan FEIS Chapter 4, i.e., Alternative 3 in the current analysis. Alternative 2 would result in considerable reductions in recreation use associated with the developed facilities found along the Allegheny Reservoir and Allegheny River. There are no changes in recreation use anticipated as a result of proposed S&G's 1 through 13, and 15 in Alternatives 1 and 2, therefore there will be no further discussion related to Bald eagle and Indiana bat. Only S&G 14 would impact recreation use.

Economics

In summary, there may be small impacts to local economies related to timber values associated with Alternatives 1 and 2. With Alternative 2, there are additional impacts to local economies as a result of reduced recreation use. In Alternative 3, there are no impacts to local economies beyond those discussed in the Forest Plan FEIS (pp. 4-120 through 122).

CUMULATIVE EFFECTS AND FUTURE FORESEEABLE ACTIONS

The Forest Plan EIS (pp. 4-61 through 4-122) evaluated cumulative effects as "the result of the application of all management practices needed to provide the outputs and benefits of the selected alternative, Alternative D." Those management practices that depend on or are affected by the new S&G's evaluated in this EIS are called "future foreseeable actions." The cumulative effects described in this section result from the future foreseeable actions of the ANF, as they might be influenced by the alternatives being evaluated in this EIS.

PHYSICAL CHARACTERISTICS

Roads

The implementation of Alternatives 1 or 2 will produce negligible effects to road management. Past, present, and future actions, as well as conditions in the cumulative effects area, are not expected to exceed those effects found pages 4-72 through 4-74. No additional effects would occur with Alternative 3, as there is no additional resource protection proposed.

Water Quality

The S&G's proposed in Alternatives 1 and 2 would result in no direct changes to water quality (pp 4-74 through 4-75). There are no past activities or known future activities and/or proposals in the cumulative effects area that would change water quality; therefore, there are no cumulative effects from implementing either Alternatives 1 or 2.

Alternative 3 could have an indirect effect on water quality by allowing the Zebra mussel to become established in the Allegheny Reservoir and the Allegheny River. However, past activities and known future activities or proposals in the cumulative effects area are not expected to add to the water quality problems identified on pages 4-74 through 4-75; therefore, there are no cumulative effects from implementing Alternative 3.

BIOLOGICAL CHARACTERISTICS

Forest Vegetation and Habitat for Threatened and Endangered Species

The effect of implementing Alternatives 1 or 2 on forest vegetation would be a slight change in habitat for the Bald eagle, no change for the T&E mussels, and a slight change in habitat for the Indiana bat. These changes are all for the benefit of the species. Past, present, and future actions, as well as conditions in the cumulative effects area, are not expected to exceed those effects found in Chapter 4. Consequently there will be no cumulative effects to habitat for T&E species from any of the alternatives.

Wildlife Habitat

Management Indicator Species

There may be minor effects on the habitat of several management indicator species (MIS)(pileated woodpecker, red-shouldered hawk, barred owl, and yellow-bellied sapsucker) as a result of S&G's proposed in Alternatives 1 and 2. However, when these effects are considered at the programmatic level, there are

virtually no effects on the MIS (p. 82). Past, present, and future actions, as well as conditions in the cumulative effects area, are not expected to exceed those effects found on page 82. Consequently there will be no cumulative effects to MIS from any of the alternatives.

Federally Proposed, Endangered, or Threatened Species and Regionally Sensitive Species

Alternatives 1, 2, and 3 are not expected to have adverse impacts on the Northern long-eared bat. Alternatives 1, 2, and 3 are not expected to cause a trend toward federal listing for the sensitive aquatic fauna (p. 74). The S&G's proposed in Alternatives 1 and 2 are expected to minimize or delay the potential introduction of the Zebra mussel from Forest Service boat launches. Analysis of the cumulative effects area shows that introductions from normal water flows and from non-Forest Service boat launches could allow the Zebra mussel to become established in the Allegheny Reservoir or the Allegheny River. Since the S&G's do not contribute to this establishment, there are no cumulative effects from these alternatives. Alternative 3 does not require actions to limit the spread of the Zebra mussel in the Allegheny drainage from ANF boat launches (p. 74). When considered along with other non-ANF boat launches in the cumulative effects area, there is likelihood that the mussel may become established. However, it is not likely that these cumulative effects will cause a trend toward federal listing for the sensitive aquatic fauna.

Aquatic Resources

The effect on aquatic resources from Alternatives 1 and 2 is to maintain present aquatic conditions by the exclusion of the Zebra mussel from the Allegheny Reservoir and Allegheny River (p. 74). Past and future actions, as well as present conditions in the cumulative effects area, are not expected to exceed those effects found on page 74. Negative cumulative effects will not be greater as the S&G's presented in Alternatives 1 and 2 actually improve the likelihood of a Zebra mussel-free environment.

Alternative 3 does not require actions to limit the spread of the Zebra mussel in the Allegheny drainage from ANF boat launches (p. 74). When considered along with other non-ANF boat launches in the cumulative effects area, there is likelihood that the mussel may become established.

Social/Economic Characteristics

Recreation Resources

Alternative 1 and 3 have negligible impacts on recreation resources. Consequently, no cumulative effects on these elements are expected.

Alternative 2 S&G's will result in considerable impact to the resource from closing boat launches (S&G 14). Other launch facilities within the cumulative effects area will remain open and will have the effect of lessening the impacts of this alternative. However, these cumulative effects are not expected to replace the negative effect on recreation use.

Economics

Alternatives 1 and 3 have negligible impacts to the economies as a result of the S&G's contained therein. Consequently, there cannot be any cumulative effects on these elements.

Alternative 2 S&G's will result in considerable impact to the economics from closing boat launches (S&G 14) and thus reducing recreation use. Other launch facilities within the cumulative effects area will remain open and will have the effect of lessening the impacts of this alternative. However, these cumulative effects are not expected to replace the negative effect on the economy.

UNAVOIDABLE ADVERSE IMPACTS

In Alternative 2, boating and associated recreation uses would be severely curtailed on the Allegheny Reservoir, a change that would be upsetting or adverse to many people.

In Alternative 3, there is an increased likelihood that Zebra mussels could be introduced into the Allegheny River and Allegheny Reservoir, resulting in a possible reduction of native species from these habitats

In Alternative 3, there is a higher likelihood that Clubshell mussels and Northern Riffleshell mussels could be extirpated from the Allegheny River.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Alternative 3 (current situation) includes no actions designed to limit introduction of Zebra mussels into the Allegheny River and Allegheny Reservoir. Both Alternatives 1 and 2 are designed, each in a different fashion, to prevent such Zebra mussel introduction from facilities on ANF land. In all three alternatives, there would still be the potential for Zebra mussel introduction from non-ANF boat launches. If a Zebra mussel population were to become established in the Allegheny River or the Allegheny Reservoir, it could be an irreversible commitment from Northern Riffleshell mussel to Zebra mussel production until such time as there is a way to severely limit or eradicate the Zebra mussel population. At this time, there are no known environmentally or economically acceptable techniques that would achieve this objective.

In Alternatives 1 and 2, S&G's 1 through 5 establish buffer zones to protect abandoned or existing nest trees and roost sites, and they restrict many activities within those zones, an irretrievable commitment of resources for the period of time the buffer zone remains in effect. Unless nests become much more abundant and are located well outside the major river corridors, this type of effect would be negligible. Similar but slightly less restrictive S&G's are included in Alternative 3 (current situation).

In Alternatives 1 and 2, S&G's 6 through 11 include guidelines for leaving certain sizes and numbers of live and dead residual trees in harvest units. This represents an irretrievable commitment of that timber volume in order to minimize take of the Indiana bat Alternative 3 (current situation) also contains S&G's calling for retention of certain numbers of live and dead trees in harvest units. At this point, we expect the impacts to harvest volume in Alternatives 1 and 2 would be only slightly higher than that in Alternative 3.

In Alternative 2, all ANF boat launches would be closed to prevent Zebra mussels from being introduced into the Allegheny River and Allegheny Reservoir from these facilities. Boating and associated camping recreation would be forgone, though some people may choose to access the reservoir and river from non-ANF facilities. This loss of recreation use would be an irretrievable commitment of the recreation resource. ANF boat launches would remain open in Alternatives 1 and 3, and no such losses would occur.

SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

In Alternative 3, ANF boat launches remain open providing significant amounts of boating opportunities for the public, but there are no provisions to prevent contaminated boats from introducing Zebra mussels into the Allegheny River or Allegheny Reservoir. There is the potential for the short-term, annual boating use to negatively affect long-term productivity of the aquatic resources in these large bodies of water.

Inspecting boats at ANF boat launches in Alternative 1 or closing them in Alternative 2, if effective, would minimize the risk of these kinds of long-term impacts on the aquatic resource. However, in all alternatives there is the risk of Zebra mussels being introduced from boat launches in New York and Pennsylvania that are not ANF facilities, and from free-flowing waters between Lake Chautauqua and the Allegheny River.

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CHAPTER 1 - PURPOSE AND NEED

FEDERAL DECISION TO BE MADE

The decision to be made is to determine what changes are needed in existing Allegheny National Forest Land and Resource Management Plan (Forest Plan) standards and guidelines (S&G's) and monitoring requirements based upon new information and requirements regarding five Federally-listed threatened and endangered species (T&E species) found on or near the Allegheny National Forest (ANF). These changes will be documented in the format of a Forest Plan amendment.

PURPOSE AND NEED

New information concerning T&E species resulted in the preparation of the Biological Assessment for Threatened and Endangered Species on the Allegheny National Forest, December 1998 (T&E BA, 12/98). Conclusions reached as part of the analysis indicated that there is a need to amend the Forest Plan to include new or revised standards and guidelines and additional monitoring requirements. Formal consultation with the USDI Fish and Wildlife Service (which resulted in the issuance of the BO) was initiated. The BO confirmed the need for amendment to the Forest Plan.

The purpose of this analysis is to: 1) identify how new information and requirements pertaining to the four T&E species contained within the USDI Fish and Wildlife Service Biological Opinion (BO), and the five species contained within the Conservation Program for T&E Species on the Allegheny National Forest (ANF CP) (Appendix A) affect the implementation of the Forest Plan; and 2) identify what changes are needed in current Forest Plan standards and guidelines and monitoring requirements. These five threatened or endangered species are known to occur on or near the ANF: Bald eagle, Indiana bat, Clubshell mussel, Northern Riffleshell mussel, and Small whorled pogonia.

The analysis will identify how current Forest Plan direction would be changed to incorporate new information related to these T&E species in the format of revised or new standards and guidelines (S&G's) and additions to monitoring requirements.

PROPOSED ACTION

The proposed action is to amend the Forest Plan by revising three S&G's and adding twelve new S&G's. The reference to Bald eagle is dropped from one S&G and one S&G is dropped. Forty-one other S&G's relating to T&E species' needs will remain unchanged. The Monitoring Plan included in Appendix B of the Forest Plan will be modified by revising monitoring requirements for the Bald eagle and adding monitoring requirements for the Indiana bat, Clubshell mussel, Northern Riffleshell mussel and Small whorled pogonia. This will be accomplished by incorporating the mandatory terms and conditions found in the BO and the additional measures found in the ANF Conservation Program (ANF CP), as appropriate, in the Forest Plan by modifying or adding to existing standards and guidelines and by making changes to the monitoring plan.

RELATIONSHIP TO OTHER LAWS AND REGULATIONS

The following laws and regulations were considered during the analysis.

Endangered Species Act - The legal background and authority for federal agency requirements related to endangered and threatened species is found in the Endangered Species Act of 1973 (as amended) (ESA). This legislation establishes agency requirements to provide the means whereby the ecosystem upon which endangered and threatened species depend may be conserved and that agencies shall provide a program for the conservation of such species. The Act establishes the policy that all Federal departments and agencies will further the purposes of this Act. Discussion in this EIS will pertain to actions and proposals that fulfill obligations and requirements of Sections 7(a)(1) and (2) of the ESA.

Under Section 7(a)(1) "...Federal agencies shall, in consultation with, and with the assistance of the USF&WS ...carry out programs for the conservation of endangered species and threatened species... ." Compliance with this

section of the Act has been satisfied by the preparation of the ANF CP (Appendix A), and by consultation with the USDI Fish and Wildlife Service. Under Section 7(a)(2), Federal agencies shall consult with the USDI Fish and Wildlife Service (FWS) to "insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of... critical habitat." Compliance with this section of the Act has been satisfied by completion of the formal consultation process between the ANF and FWS and issuance of the BO. Consultation or review of site-specific projects with FWS will continue as new projects that have the potential to impact T&E species are planned.

In December 1998 the ANF and FWS entered into formal consultation regarding the potential effects of implementing activities outlined in the Forest Plan on the Bald eagle, Indiana bat, Clubshell mussel, and northern Riffleshell mussel. Issues related to Small whorled pogonia were resolved through informal consultation. In June 1999 the FWS issued a Biological Opinion that includes reasonable and prudent alternatives, an incidental take statement, reasonable and prudent measures, terms and conditions, and conservation recommendations. In December 1999 the ANF completed a Conservation Program that complies with Section 7(a)(1) requirements, and also includes specific actions outlined in the BO. ANF review of the BO and the ANF CP indicate that current Forest Plan direction (when modified to include one of the reasonable and prudent alternatives proposed for the Riffleshell mussel in the BO) does not jeopardize the continued existence of these species. The ANF CP outlines a program for the conservation of these species that can be fully implemented under existing Forest Plan management direction when these modifications are made.

National Forest Management Act (NFMA) – The legal background and authority for forest plans is found in the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) as amended by the National Forest Management Act of 1976 (NFMA), and implementing regulations found in 36 CFR Part 219.10 (f). Direction described in Forest Service Manual 1922 and Forest Service Handbook 1909.12 Chapter 5 provides guidance on the development and amendment procedures for forest plans.

NFMA establishes requirements for development of land management plans and the need for amendment or revision as change occurs. Forest Service manual direction establishes the criteria that are used to evaluate whether an amendment should be considered ''significant' or not. This proposed amendment is in accordance with Chapter 5, page 5-8 of the Land and Resource Management Plan of the Allegheny National Forest; the requirements of 36 CFR 219.10(f); and Forest Service Manual 1922. The amendment is programmatic in nature; that is, it provides overall guidance for management of the ANF rather than proposing a specific project at a particular location. Further environmental analysis will be conducted for subsequent site-specific projects that implement the proposed Forest Plan amendment.

The Forest Supervisor has the authority to determine whether an amendment is significant or not significant (36 CFR 219.10). This determination is made under the direction found in 16 U.S.C. 1604(f)(4), 36 CFR 219.10(f), and Forest Service Manual (FSM) 1922.5. The Forest Supervisor has followed these procedures and has determined that this is not a significant amendment to the Forest Plan.

The term 'significant,' as it pertains to a Forest Plan amendment, is not the same as significant in the context of addressing environmental effects in a National Environmental Policy Act (NEPA) analysis (as might be found in the language of an environmental assessment). Significant as it pertains to a Forest Plan amendment gauges the impact of a proposed change to a Forest Plan. To meet the definition of significant, an amendment must meet criteria found in Forest Service Manual (FSM) 1922.52. Two examples of circumstances that may cause a significant change to a forest plan are:

1. Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected (36 CFR 219.10(e)); and
2. Changes that may have an important effect on the entire forest plan or affect land and resources throughout a large portion of the planning area during the planning period.

As discussed in FSM 1922.51, non-significant amendments can result from:

1. Actions that do not significantly alter the multiple-use goals and objectives for long term land and resource management;
2. Adjustments of management area boundaries or management prescriptions resulting from further on-site analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long-term land and resource management; and.
3. Minor changes to standards and guides.
4. Opportunities for additional management practices that will contribute to achievement of the management prescription.

An evaluation was made based on an analysis of the effects of the proposed changes to the Forest Plan (Alternative 1) to determine whether or not the amendment would result in a significant change in the Forest Plan. Based upon review of National Forest Management Act Regulations (CFR 219.10(f)) and Forest Service Manual Direction (FSM 1922.5), the Forest Supervisor concluded that this amendment is 'non-significant.' The rationale for this conclusion is based on the following factors:

This amendment does not meet the criteria for significance as described in FSM 1922.52:

1. The long-term relationship between the outputs of multiple-use goods and services originally projected will not be substantially altered, as documented in the effects analysis of this environmental impact statement. The effects section of this EIS discloses that there are no substantial effects or substantial changes expected to any of the outputs of multiple-use goods and services originally projected by the Forest Plan. Therefore, the long-term relationships between multiple-use goods and services will not be substantially altered.
2. While the amendment is important, its effects are primarily limited to assuring that jeopardy to Northern Riffleshell mussel does not occur and that activities that implement the Forest Plan minimize potential incidental take by following the terms and conditions outlined in the BO. The actual effect on other lands and resources throughout the planning area is minimal.

This amendment does meet the criteria for a non-significant amendment described in FSM 1922.51 in the following ways:

1. The multiple-use goals and objectives are not significantly altered in the long term. The Forest Plan goals and objectives, as stated on page 4-1 and 4-2 of the Forest Plan, are not altered in any way.
2. No changes in management area boundaries are being proposed.
3. There are 45 existing standards and guidelines that were examined in this analysis to determine what changes, if any, were indicated based upon new information contained with the BO and ANF CP. There are no changes proposed for 41 existing S&G's. Revision is proposed for 3 S&G's, reference to Bald eagle is proposed to be removed from one S&G, and one S&G is proposed to be dropped. There are 12 new S&G's proposed to be included in Forest Plan direction. These changes result in minor effects when implemented, as evidenced by the effects discussion included in Chapter 4 of this document.

National Environmental Policy Act (NEPA) – The National Environmental Policy Act (NEPA), and implementing regulations found in 40 CFR 1500-1508 is the basic national charter for the protection of the environment. NEPA procedures insure that environmental information is available to public officials and citizens before decisions are made, so that ultimately, better decisions can be made. A primary concern is that NEPA documents concentrate on issues that are truly significant to the action in question.

Scoping is the process that is used to determine the scope of issues to be addressed and to identify the significant issues to be analyzed in depth in an EIS. The scope of a particular analysis can be narrowed by identifying issues that are not significant or have been covered by prior environmental review. Other environmental reviews that will be prepared that are related to, but not a part of, the scope of the impact statement under consideration shall be identified (40 CFR 1501.7).

'Tiering' refers to the coverage of general matters in broader environmental impact statements with subsequent narrower statements. Tiering is appropriate when the sequence of statements or analyses is from a program, plan, or policy environmental impact statement to a program, plan, or policy statement of analysis of lesser scope. Tiering is also appropriate when the sequence of statements is from an environmental impact statement on a specific action at an early stage to a supplement or a subsequent statement or analysis at a later stage. This is appropriate when it allows the focus of analysis to center on issues that are ripe for decision and exclude from consideration issues already decided or not yet ripe.

The scope of this EIS will be limited to the modifications needed at this time to incorporate changes to standards and guidelines as indicated by the ANF CP and BO. The scope could have been expanded to a wider range of consideration; however, issues identified in scoping that would support this consideration are related to broader analyses such as a Forest Plan revision.

Public comment has indicated a desire for consideration of alternatives related to the widespread application of uneven-aged management and to cessation of timber harvest. Both of these issues were considered in detail in the development of the current Forest Plan. While these issues are related to management practices that impact T&E species, they are much broader in scope than only T&E species concerns. In order to adequately address all of the issues related to these alternatives, an analysis of much broader scope is needed. This will occur when the Forest Plan is revised, which is scheduled to occur in 2002/2003.

Public comment has also focused on whether or not this amendment should address needs associated with sensitive species. Conservation assessments and strategies have not yet been prepared for these species, therefore decisions related to sensitive species are not yet ripe. Should these future assessments indicate that changes to the Forest Plan are needed, an amendment may be prepared. A biological assessment has been prepared for this EIS that addresses impacts of proposed changes to the Forest Plan on listed species The analysis finds that the changes proposed here have a no adverse impact determination on listed sensitive species.

FOREST PLAN DIRECTION AND RELATIONSHIP TO OTHER DOCUMENTS

The Allegheny National Forest Land and Resource Management Plan and Final Environmental Impact Statement (Forest Plan, FEIS), approved in 1986, provides direction for management of forest resources. The Forest Plan was developed to ensure the continued viability of all native species on the ANF, while providing a variety of goods and services to the American people. The planning process included formal consultation with FWS and culminated with the issuance of the FWS Biological Opinion on the 1986 Forest Plan. The Forest Plan includes management direction and standards and guidelines to protect and enhance habitat of endangered or threatened species (Forest Plan, pp. 4-37 to 4-41). Appendix B of the Forest Plan includes a monitoring plan intended to measure whether or not management objectives are being achieved and if effects are as predicted.

Periodic correspondence and conversations between ANF and FWS personnel has occurred between 1986 and the present time. As new information pertaining to T&E species has emerged, or as major projects have been analyzed, informal consultation has taken place. Informal consultation between ANF and FWS personnel increased in 1998 due to the documented occurrence of an endangered species (Indiana bat) that was previously believed not to occur on the ANF. Discussions related to bat survey methodology and the preliminary survey results ensued.

There are three documents that have been prepared by ANF and FWS personnel that are pertinent to this analysis. A brief discussion is presented here. More detailed discussion is provided later in this chapter.

The Biological Assessment for Threatened and Endangered Species on the Allegheny National Forest (T&E BA), December 1998 was prepared in response to new information related to five T&E species (Bald eagle, Indiana bat, Clubshell mussel, Northern Riffleshell mussel, and Small whorled pogonia). The T&E BA (12/98) summarizes the anticipated effects of implementation of the current Forest Plan and outlines recommendations for terms and conditions and conservation strategy measures for FWS consideration. The T&E BA (12/98) was provided to FWS to initiate formal consultation on December 17, 1998. An agreement

to modify survey techniques for Small whorled pogonia was established through informal consultation (December 21, 1998).

The Biological Opinion (BO), June 1999, documents FWS findings on four T&E species. The BO takes into consideration information provided in the T&E BA (12/98). It includes reasonable and prudent alternatives and measures, terms and conditions, allowance for take, and conservation recommendations for these species. The ANF is required to implement one of three reasonable and prudent alternatives to avoid the likelihood of jeopardizing the continued existence of the Northern Riffleshell mussel. The ANF is also required to implement the mandatory terms and conditions to minimize the incidental take of Indiana bat, Bald eagle, Clubshell mussel, and Northern Riffleshell mussel in the course of implementing the otherwise lawful activities of the Forest Plan. The BO does not include discussion pertaining to Small whorled pogonia, as issues related to this species were resolved through informal consultation.

The Biological Opinion was amended on June 1, 2000 to allow category-specific incidental take not realized in one fiscal year to be carried over into fiscal years beyond 2003, at annual levels not to exceed those authorized for 2003. Neither the annual nor the cumulative category specific totals shall be exceeded without further consultation with the Fish and Wildlife Service.

ANF Conservation Program - Section 7(a)(1) of the ESA requires that National Forests establish programs that further the conservation of T&E species. ANF personnel have compiled a plan that outlines the specific actions that will be implemented for each species in order to promote the conservation of the species (Appendix A). These specific actions are either contained in the current Forest Plan, a part of the proposed action or an action that can be taken administratively (that is, outside of the planning process). The Zebra Mussel Action Plan is part of Appendix A of this document. It outlines the specific procedures to be implemented at ANF boat launch facilities.

This EIS tiers to the Forest Plan and the analysis completed in the FEIS for the Forest Plan. It incorporates by reference (40 CFR 1502.22) the information from The Biological Assessment for Threatened and Endangered Species on the Allegheny National Forest (T&E BA 12/98), December 1998, the ANF Conservation Program (ANF CP), and the Biological Opinion, June 1999, prepared by the FWS.

There have been 10 previous amendments to the Forest Plan. This EIS also incorporates the analysis and supporting documents for all 10, with the following four amendments being the most relevant to this EIS:

FEIS "Understory Vegetation Management", March 1991 - This document expands the environmental consequences discussion on herbicide use. It supplements programmatic direction for the control of understory vegetation on the ANF. It supplements S&G's.

Fisheries Amendment Environmental Assessment (December 1996) - This document supplements the effects discussion related to water quality. It provides the S&G's for the coordination of water resources with various land disturbing activities.

Wild and Scenic River EIS (December 1996) - This document designates a corridor boundary for the Allegheny National Wild and Scenic River, approves the River Management Plan, and provides Forest Plan S&G's for managing federal lands within the designated corridor.

FEIS "Vegetation Management on Electric Utility Rights-of-Way", May 1997 - This document adds the herbicide effects discussion and provides S&G's that authorize the use of herbicides on special-use rights-of-way.

BACKGROUND

Consultation History

ANF and FWS personnel have been involved in informal consultation and information exchange since the approval of the Forest Plan in 1986. The ANF has responded to new information or the completion of informal

consultation by initiating surveys or by including additional documentation in Biological Evaluations (BE) or Environmental Assessments (EA), as appropriate. A brief display of consultation history and response includes:

1986 - Forest Plan is adopted. Specific standards and guidelines are included for Bald eagle and Small whorled pogonia. The Forest Plan also includes monitoring requirements for Bald eagle.

1987 - Surveys for Bald eagle and Small whorled pogonia surveys on ANF are initiated.

1989 - Allegheny River Wilderness Islands mussel survey completed. Clubshell mussel and Northern Riffleshell mussel are both found.

1992 - FWS revises Small whorled pogonia recovery plan.

1993 - Clubshell mussel and Northern Riffleshell mussel listed as endangered; recovery plan drafted.

1993 - ANF and FWS personnel meet to discuss status of T&E species and survey strategies for Bald eagle, Clubshell mussel, Northern Riffleshell mussel and Small whorled pogonia.

1994 - Mussels surveys on 10 streams on ANF completed. No Clubshell mussels or Northern Riffleshell mussels found.

1995 - ANF personnel update the Biological Evaluation for the Forest Plan for all T&E species with potential habitat on ANF. FWS indicates that formal consultation is not needed, but that informal consultation should continue for Bald eagle, Clubshell mussel and Northern Riffleshell mussel as new data is gathered. Status of Small whorled pogonia is changed to threatened.

1996 - FWS issues draft recovery plan for Indiana bat.

1996 - ANF initiates bat surveys in cooperation with Pennsylvania Game Commission. No Indiana bat are found in 1996.

1997 - ANF personnel complete a Biological Evaluation for Indiana bat that includes new information that Indiana bats are now known to utilize upland forest areas in other areas of their range. FWS issues a "no effect" determination for the ANF and makes recommendation that the ANF continue informal consultation and conduct surveys for Indiana bat.

1998 - ANF continues bat surveys through a partnership agreement with Pennsylvania State University. In August, one male Indiana bat is caught. FWS and ANF continue informal consultation and surveys through the field season, ANF prepares the T&E BA. ANF and FWS enter into formal consultation on December 17, 1998.

March 1999 - FWS issues another draft of Indiana Bat Recovery Plan.

April 1999 - ANF suspends all activities that have the potential for incidental take of Indiana bat pending receipt of BO from FWS

June 1999 - FWS completes Biological Opinion. ANF begins process to fulfill NEPA and other procedural/programmatic requirements before re-initiating existing projects or beginning new projects.

July 1999 - Bald eagle proposed for de-listing.

December 1999 - ANF completes Conservation Action Plan and prepares Draft EIS for Forest Plan amendment that addresses T&E species' needs.

Since June 1999, there has been ongoing, informal consultation between ANF and FWS personnel to integrate the requirements of the BO with ANF projects. This includes consultation on ongoing ANF projects, on the development of the Zebra mussel action plan and other actions outlined in the BO.

New Species Information

Since approval of the Forest Plan in 1986, new information regarding T&E species has become available and the T&E species list for the Allegheny National Forest has changed. The current T&E species list for the ANF includes Bald eagle, Indiana bat, Clubshell mussel, Northern Riffleshell mussel and Small whorled pogonia.

Indiana Bat

This species was addressed during formal consultation with FWS in the development of the Forest Plan. No adverse impacts to Indiana bat were anticipated as a result of actions proposed in the Plan. Status at the time of consultation was "federally endangered." New information regarding Indiana bat since 1986 includes:

- Bats are now known to frequent upland habitats throughout their range for roost and foraging purposes.
- 1996/1997 - No Indiana bats captured during surveys.
- Indiana bats have been detected by new technology (anabat detector) used in 1998 and 1999 on ANF. Surveys indicated there is high probability that Indiana bats are present at the survey site. Currently, the only FWS approved survey protocol is mist netting. One male Indiana bat was captured in a mist net in August of 1998, confirming the use of the ANF for foraging.
- 1999 - A draft Indiana Bat Recovery Plan was released for review.
- The FWS concluded in the BO that continued implementation of the Forest Plan, as written, will not jeopardize the continued existence of the Indiana bat, and that potential for incidental take cannot be avoided.
- The FWS included terms and conditions in the BO for minimizing the risk of take of Indiana bat by retaining live and dead trees. Forest Plan standards and guidelines exist that are quite similar to the terms and conditions, however they do not exactly match the terms and conditions in the BO.
- Following additional consultation with FWS after receipt of BO, verbal agreement is reached to change the residual canopy closure requirement following partial harvests treatments from ">54 percent" to ">50 percent" (USDI-1999b, p. 72). This change is based upon additional analysis that refined the relationship between canopy closure and relative stand density (deCalesta, pers. comm.).

Clubshell Mussel and Northern Riffleshell Mussel

These two freshwater mussels were not listed by FWS in 1986. New information regarding Clubshell mussel and Northern Riffleshell mussel includes:

- Both species are known to occur in the Allegheny River near the ANF wilderness islands, based on 1989 surveys.
- Both species were added to the T&E list in 1993 as Federally endangered species.
- Neither of the species were found in 10 streams on the ANF during 1994 surveys.
- Both species are vulnerable to adverse impact caused by Zebra mussels.
- The FWS concluded in the BO that the continued operation (following current operating procedures) of Forest Service marinas, boat launches and canoe access sites on the Allegheny Reservoir, Allegheny River and Allegheny River tributaries is likely to jeopardize the continued existence of the Northern Riffleshell mussel. This conclusion does not apply to the Clubshell mussel.
- The BO includes three reasonable and prudent alternatives for the management of ANF boat launches along the Allegheny River, the Allegheny Reservoir and Allegheny River tributaries that avoid jeopardy to the Northern Riffleshell mussel and adverse affects to the Clubshell mussel.

Bald Eagle

This species was included in formal consultation with FWS in the development of the Forest Plan. The conclusion reached in the 1986 BO was that impacts to the Bald eagle could occur and that standards and guidelines to protect the eagle were needed. No incidental take was allowed in the 1986 opinion. Status at the time of consultation was "federally endangered." New information regarding Bald eagle since 1986 includes:

- Bald eagles are known to nest successfully on the ANF based on discovery of nests in 1992 and monitoring of nests since then.
- Classification of Bald eagle changed to "federally threatened" in 1995 in the lower 48 states of the United States. The Bald eagle was proposed for de-listing in 1999.
- The Recovery Plan for the Bald Eagle was published in 1983. Minor errors were made in writing the S&G's in the development of the Forest Plan and, as a result, existing Forest Plan S&G's are not in compliance with the recovery plan. Corrections to existing standards and guidelines are needed to bring the Forest Plan in concert with the Recovery Plan.
- The FWS concluded in the BO that continued implementation of the Forest Plan, as written, will not jeopardize the continued existence of the Bald eagle, and that potential for incidental take cannot be avoided.

Small Whorled Pogonia

This species was not included in formal consultation with FWS in the development of the Forest Plan. Status at that time was "federally endangered"; current status is "federally threatened." The ANF is located north of two known populations of the Small whorled pogonia, one near Franklin, PA, the other near State College, PA. It is not known to occur on the ANF. Because of the paucity of information for this rare orchid, the ANF elected to include the following survey requirements in the Forest Plan:

> "Field surveys will be conducted to determine the presence of small-whorled pogonia populations when road construction, logging, herbicide treatment, trail construction, recreation development, and oil and gas developments are proposed for areas containing suitable habitat for this species." (Forest Plan, p. 4-39)

Over the past 11 years, more than 227,000 acres of the ANF have been surveyed and no Small whorled pogonia have been found. Through informal consultation with the FWS, it has been determined that a new survey strategy that focuses on the highest potential habitat on a more regular basis is needed (December, 1998). Consequently, the requirement for surveys on a project basis is proposed to be dropped through this Forest Plan amendment. An additional FWS requirement is that in the event the species is found, consultation will be initiated.

Biological Opinion

In June 1999, the FWS issued a final Biological Opinion on the Impacts of Forest Management and Other Activities to the Bald Eagle, Indiana Bat, Clubshell Mussel and Northern Riffleshell Mussel on the Allegheny National Forest, Pennsylvania. Small whorled pogonia is not addressed in the BO because issues related to it were resolved in informal consultation in December 1998. The BO represents the results of the formal consultation process between ANF and FWS personnel and fulfills the requirements of Section 7(a)(2) of the ESA. The findings of the BO are based upon the best available science and research, the Recovery Plans for each of the species, and a thorough understanding of the Forest Plan objectives, activities, standards, and guidelines.

The FWS reached several important conclusions in the BO that are pertinent to this analysis and the development of the proposed action:

> "After reviewing the current status of the northern Riffleshell, the environmental baseline for the action area, the effects of the proposed actions, and cumulative effects, it is the Service's biological opinion that continued operation of Forest Service marinas, boat launches and canoe access sites on the Allegheny Reservoir,

Allegheny River and Allegheny River tributaries is likely to jeopardize the continued existence of the northern Riffleshell. Failure to incorporate measures to prevent or reduce the risk of zebra mussel introduction at these boating facilities can be reasonably expected to reduce appreciably the likelihood of both the survival and recovery of the northern Riffleshell by reducing the reproduction, abundance and distribution of the species, since one of only two known reproducing and viable populations occurs within and downstream of the action area. It is also the Service's biological opinion that implementation of the Allegheny National Forest Land and Resource Management Plan, and other projects predicated upon it through the year 2003 (with the exception of the operation of boating facilities, as noted above), is not likely to jeopardize the continued existence of the northern Riffleshell.

After reviewing the current status of the bald eagle, Indiana bat, and Clubshell mussel; the environmental baseline for the action area; the effects of the proposed actions; and cumulative effects; it is the Service's biological opinion that implementation of the Allegheny National Forest Land and Resource Management Plan, and ongoing projects and projects predicated upon it through the year 2003, as proposed in the Biological Assessment, is not likely to jeopardize the continued existence of these species.

No critical habitat has been designated for the bald eagle, Clubshell or northern Riffleshell mussel; therefore, none will be affected. Critical habitat for the Indiana bat has been designated at hibernacula in Illinois, Indiana, Kentucky, Missouri, Tennessee and West Virginia; however, this action does not affect these areas, and no destruction or adverse modification of critical habitat is anticipated" (USDI 1999b, p. 61).

The FWS provides three reasonable and prudent alternatives:

"The Service is providing the Forest Service with three reasonable and prudent alternatives. If any alternative is implemented fully and in a timely manner, it will significantly reduce the Forest Service's potential to cause zebra mussel infestation of the middle Allegheny River and, therefore, avoid the likelihood of jeopardizing the continued existence of the northern Riffleshell and violation of section 7(a)(2) of the Act. The Service has discussed these alternatives with the Forest Service, and concludes that implementing all of the components of the reasonable and prudent alternatives is necessary to ensure that the operation of Forest Service boating facilities is not likely to jeopardize the continued existence of the northern Riffleshell" (USDI 1999b, p. 62).

As noted in the T&E BA (12/98) and in the BO, although no jeopardy conclusions were reached as stated above, "take" of the four T&E species cannot be avoided. The BO states:

"Section 9 of the Endangered Species Act and federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of sections 7(b)(4) and 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act, provided that such taking is in compliance with the terms and conditions of the Incidental Take Statement included in the BO.

The measures described [below] are non-discretionary, and must be undertaken by the Forest Service so that they become binding conditions of any grant, permit or contract issued to any applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Forest Service has a continuing duty to regulate the activities covered by this Incidental Take Statement. If the Forest Service 1) fails to assume and implement the terms and conditions; or 2) fails to require applicants to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to permits, contracts and/or grant documents, the protective coverage of sections 7(o)(2) may lapse. In order to monitor the impact of incidental take, the ANF

must report the progress of the action and its impacts on the species to the Service as specified in the Incidental Take Statement [50 CFR 402.14 (I)(3)]" (USDI 1999b, pp. 64-65).

The BO also includes reasonable and prudent measures, and terms and conditions that are necessary to minimize the take of the T&E species included in the BO. The terms and conditions are the basis for some of the proposed changes and additions to standards and guidelines, or monitoring requirements (USDI-FWS 1999b, pp. 69-78).

Lastly, the BO offers conservation recommendations:

"Section 7(a)(1) of the Endangered Species Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information" (USDI-FWS 1999b, pp. 78-80).

ANF Conservation Program (ANF CP)

In December 1999, ANF personnel reviewed the BO and information contained within the Recovery Plans, consulted with technical experts, and incorporated local expertise and knowledge to develop the ANF Conservation Program for Bald eagle, Indiana bat, Clubshell mussel, Northern Riffleshell mussel, and Small whorled pogonia. This program includes the actions that will be implemented with respect to T&E species in response to both Section 7(a)(1) and (2) requirements.

While there are distinctions in the requirements of each of these sections of ESA, there is a great deal of similarity between the actions being proposed to comply with both. For purposes of developing a comprehensive plan that provides for continuity in implementation and ease of reference, the actions will be presented in one plan. Some of the items included are the non-discretionary terms and conditions issued in the BO (Section 7(a)(2) requirements), while others are conservation recommendations or Recovery Plan recommendations that meet Section 7(a)(1) requirements that the ANF has elected to make a part of the Conservation Program. The Conservation Program is found in Appendix A.

The Zebra Mussel Action Plan is a part of the ANF CP. It outlines the specific procedures that will be implemented at ANF boat launch facilities. This plan has been developed through extensive consultation with FWS personnel. The plan will be reviewed and updated periodically as needs change, in consultation with FWS.

Consistency between the Forest Plan, the Biological Opinion, and the ANF Conservation Program

As pre-work to the development of this EIS, ANF personnel reviewed the BO and information contained within the ANF CP. The BO and ANF CP were compared with existing Forest Plan standards and guidelines, monitoring requirements and research needs to determine differences between the documents (see Appendix B). The Forest Plan includes standards and guidelines that satisfy many of the mandatory terms and conditions of the BO. Some of the terms and conditions from the BO are slightly different than what is currently described by the S&G's. There are some terms and conditions that are not included within existing S&G's. The BO also includes requirements for monitoring the effectiveness of measures applied to protect T&E species and their habitats. The Forest Plan Monitoring Plan does not presently include all the T&E species included in the BO.

Summary of Background Information

The discovery of and response to new information related to five Federally-listed threatened or endangered species is in full compliance with the requirements of the ESA:

- Formal consultation was completed as part of the development of the Forest Plan.
- Informal consultation was an ongoing process between 1986 and 1998.
- Formal consultation was initiated with FWS in 1998.

- FWS personnel issued a Biological Opinion in June 1999.
- ANF personnel developed the ANF Conservation Program. It was presented to FWS as part of consultation that is ongoing.

The requirements contained within the BO and the ANF Conservation Program were reviewed to determine appropriate disposition for implementation. Some items are best addressed by modifying or adding to the standards and guidelines and modifying Forest Plan monitoring requirements. In accordance with NFMA, an amendment to the Forest Plan is appropriate.

SCOPING

Scoping is the process used to determine the significant issues that are related to the proposed action. A requirement of NEPA, scoping (for an EIS) is initiated with the publication of a Notice of Intent to Prepare an Environmental Impact Statement (NOI) in the Federal Register. The NOI for this project was published on February 8, 1999. In addition to the NOI, approximately 350 letters were sent to individuals and organizations asking for comment on the proposed amendment. A news release describing the proposal and asking for comments was distributed to nearly 225 media outlets. Eleven letters were received in response to scoping efforts and were reviewed by the Interdisciplinary Team (ID Team). The ID Team also considered comments developed from reviewing the Forest Plan records, the Biological Opinion, and input from ANF resource specialists. A summary of these comments is found in Appendix C.

T&E SPECIES BACKGROUND INFORMATION

Background information for the Bald eagle, Indiana bat, Clubshell mussel and Northern Riffleshell mussel will be provided here. Refer to Page 6 for background information for Small whorled pogonia. This information will give the reader the basis for the evaluation of the effects on individual resources that is presented in Chapter 4.

Bald Eagle

On July 12, 1995, the USDI Fish and Wildlife Service reclassified the Bald eagle *Haliaeetus leucocephalus* from endangered to threatened throughout the lower 48 states of the United States. In March 1998, the FWS announced plans to analyze information to determine if the Bald eagle should be de-listed. In July 1999, the Bald eagle was proposed for de-listing by FWS.

The FWS has divided the lower 48 states into 5 recovery regions. Northwestern Pennsylvania, including the ANF, is in the Northern States region. This region has a de-listing goal of 1,200 occupied breeding areas distributed over a minimum of 16 states, with an average annual productivity of at least 1.0 young per occupied nest. In 1994, there were 1,772 known occupied territories distributed over 21 states with an estimated 1.26 young per occupied territory (Federal Register, 1995).

Distribution

Twenty-two active Bald eagle nests have been found in Northwestern Pennsylvania (PGC 1999 unpublished). Three of these active nests are located within or near the ANF proclamation boundary. Two of the nests are on the sides of hills adjacent to the Allegheny Reservoir and one is on an island (private land) in the Allegheny River near Tionesta. The success for these three nests is presented in Table 1 (PGC 1999 unpublished). Predator guards have been placed on all three nests. Causes of nest failures in 1994, 1995 and 1999 are unknown (PGC 1999 unpublished).

Table 1. Bald Eagle Nesting Status for the ANF

Nest Location	Year Found	Young Produced								
		1992	1993	1994	1995	1996	1997	1998	1999	Total
Kinzua	1993	-	1	0	2	2	1	2	0	8
Cornplanter	1998	-	-	-	-	-	-	1	2	3
Tionesta	1993	2	2	2	0	2*	1	2	2	13
TOTALS		2	3	2	2	4	2	5	4	24

**** Moved from hillside to island in River.***

Habitat

In Northwest Pennsylvania, Bald eagles nest in large trees usually near a body of water. Both of the nests on the ANF are in white pines. These large white pines tower above the adjacent hardwood canopy allowing easy access to the nest while providing some concealment and shade in the form of evergreen branches. The nest on the island in the Allegheny River is found in a large sycamore tree.

Eagles forage along rivers, large streams, and lakes. They often perch in trees near the water's edge and wait for fish or waterfowl to come along. In the winter, they sometimes congregate in winter roosts; these roosts commonly have 6 to 10 eagles in 1 or 2 trees.

Habitat on the Allegheny National Forest

The Allegheny Reservoir and the Allegheny River provide the best nesting, foraging, and winter perching habitat on the Allegheny National Forest. Both adult and juvenile eagles are frequently seen around the Allegheny Reservoir. Three adults have attended the nest near Kinzua Dam in the same season, a behavior that has been reported in the literature (Brenda Pebbles, pers. comm.).

The Allegheny River is lined with sycamores, silver maples, oaks, white pines, and a variety of hardwoods that provide ample perching sites for foraging eagles. Searches for both summer and winter roost sites on the ANF have been made, however, none have been found.

The larger streams on the ANF provide enough open canopy and access to the water to provide foraging habitat for Bald eagles. Eagles have been observed foraging along Tionesta Creek, Salmon Creek, Kinzua Creek, Clarion River, Millstone Creek, Big Mill Creek, Sugar Run, and Willow Creek. Brokenstraw Creek, Conewango Creek, and the upper Allegheny River in New York State are eagle foraging areas adjacent to the ANF.

Eagles occasionally utilize the small impoundments spread throughout the ANF. Eagle sightings have been made at Buzzard Swamp, Beaver Meadows, Twin Lakes, Mead Run ponds, and the Owls Nest ponds.

The primary management actions for Bald eagles on the ANF are protecting and monitoring known nest sites, and searching for new nests and roosting areas.

Indiana Bat

Much of the life history information for the Indiana bat is summarized in the Habitat Suitability Report by Romme *et al.* (1995) and in the Technical Draft of the Indiana Bat Recovery Plan prepared by the Indiana Bat Recovery Team in 1999 (USDI-FWS, 1999a). New information on Indiana bat habitat requirements and distribution is developing rapidly as research and surveys continue. Information presented here incorporates the most current scientific knowledge by utilizing portions of these reports as well as new information to provide an understanding of the life history of the Indiana bat in Pennsylvania.

The Indiana bat was listed as endangered by the FWS in March 1967. A team of bat experts completed a recovery plan in 1983 (USDI-FWS, 1983). A revised draft recovery plan was released for public review in 1999 (USDI-FWS, 1999a).

Distribution

Distribution of the Indiana bat is described as the eastern United States from Oklahoma, Iowa, and Wisconsin, east to Vermont and south to northwestern Florida (Romme *et al.*, 1995). This migratory species may be found throughout its range during the summer, but is restricted to caves in the winter where it hibernates. More than 85 percent of the known Indiana bats found in the U.S. (about 292,000) winter in large limestone caves in Indiana, Kentucky, and Missouri. The populations in these caves declined by 38% between 1983 and 1997 (USDI-FWS 1999a). Pennsylvania has eight known hibernacula with an estimated population of over 300 Indiana bats. The closest known hibernaculum to the ANF is in Armstrong County about 60 miles southwest of the ANF. The population may be increasing in New York, Pennsylvania, and West Virginia, but complex cave systems make surveying difficult (USDI-FWS 1999a).

The Indiana Bat Draft Recovery Plan shows a few summer records for the Indiana bat in Ohio near Lake Erie and the Pennsylvania-Ohio state line. These records are old band recoveries that were reported in Barbour and Davis (1969).

New York has a wintering population of about 15,000 Indiana bats (mostly in the central and eastern portion of the State) although no summer roosting sites have been found (Appendix D, p. 15).

Occurrence of the Indiana Bat on the Allegheny National Forest

In May 1998, the ANF, as part of a partnership agreement with Pennsylvania State University, Altoona Campus, initiated a two-year survey of potential Indiana bat foraging areas. Twenty-five sites, which were well distributed across the ANF landscape, were selected for sampling in 1998 using both mist nets and anabat detectors. Sampling procedures that follow FWS mist netting protocols are being used. Additional data are collected using anabat detectors. Anabat detection is relatively new technology that presently does not absolutely confirm the presence of a particular species of bat, although it does indicate a very high probability that the species is present. In 1999 additional surveys were completed to bring the two-year total of survey sites to 57.

Of the 57 sites surveyed, Indiana bats were detected at 11 sites. Only one Indiana bat was caught in a mist net. (Gannon 2000 unpublished).

Reproduction

Like other Myotis species, Indiana bats mate in Autumn. The females store the sperm through the winter hibernation period and fertilization occurs in the Spring. The females are, therefore, pregnant when they arrive at the summer maternity colony (mid April to late May) and give birth to one young in late June to early July. Juveniles become volant beginning in early July to early August. Juveniles may mate their first Autumn (USDI-FWS, 1999a).

Food Habits

Indiana bats eat a variety of flying insects, both terrestrial and aquatic. Reproductively-active females and juveniles may consume a greater diversity of insects than males and non-reproductively active females (USDI-FWS, 1996). By examining fecal material, Brack (1983) found that Lepidoptera (moths) comprised 48 percent of their diet while Coleoptera (beetles) made up 24 percent.

Habitat

Summer Roosting Habitat

Upon emergence from the hibernacula in the spring, females travel varying distances to their summer maternity roosts. In Kentucky, females dispersed 4 to 10 miles from the hibernaculum (USDI-FWS 1999a). Females emerge prior to males. Males generally do not travel as great a distance as the females, are more solitary, and at times use caves to roost in the summer (Widlak 1997). In Kentucky, Missouri, and Virginia male movements ranged from 2.5 to 10 miles (USDI-FWS 1999a).

Indiana bats typically roost in snags or live trees during the day throughout the summer, although in 1997 two lactating females were found in the attic of the Canoe Creek Church (Hassinger and Butchkowski, 1998). Most roost sites are located beneath loose or exfoliating bark or in tree cavities. Preferred roost trees are larger than 9 inches diameter breast height (dbh) and are located in forested habitat where the degree of overstory canopy closure ranges from 60 to 80 percent. In general, it appears that the largest available trees with exfoliating bark or cavities with at least some daily exposure to sunlight are the most likely to be used as maternity roosts. Most roosts are within 0.6 miles from a water source. The quality of roost habitat decreases slightly as canopy closure increases above 80 percent or decreases below 60 percent (Romme *et al.*, 1995).

Unlike females, which seem to prefer very large trees as maternity roosts, it appears that males are less selective and will use trees of almost any size as roosts, as long as they have loose bark or cavities under or into which to crawl (Kiser and Elliott 1996).

Summer maternity colonies found to date number 100 or fewer adults (Gardner *et al.*, 1991). Females in maternity colonies use multiple roosts. Most colonies use at least one primary roost where the majority of the colony roosts together. In Missouri, one to three primary roosts were used (Callahan *et al.*, 1997). Additionally, several secondary roosts occur in the vicinity of the primary roosts (Callahan *et al.*, 1997; Gardner *et al.*, 1991). Primary roosts were standing dead trees exposed to direct sunlight. Alternate roosts included both living and dead trees located within more shaded areas of forest stands. Use seems to be influenced by weather conditions.

Roost trees are naturally ephemeral. Individual roost trees are only suitable until all bark sloughs off or the tree falls to the ground (Callahan *et al.*, 1997; Clawson, 1986; Gardner *et al.*, 1991; Kurta *et al.*, 1993; Kurta *et al.*, 1996). Many are suitable only for a few years (Gardner *et al.*, 1991; Humphrey *et al.*, 1977), while others may last 10 to 20 years. Bats that depend on these ephemeral roosts have developed a natural survival mechanism to find alternate roost trees when a suitable roost tree becomes unsuitable. Tree removal does not discourage Indiana bats from using dead trees nearby as roosts and, in fact, may enhance habitat by opening up the forest canopy allowing more sunlight to hit the tree making it warmer and thermally more stable (USDI-FWS 1999a).

Management of an area for a perpetual supply of potential roost trees is much more important than trying to manage individual roost trees (Callahan *et al.*, 1997; Clawson, 1986; Kiser and Elliot, 1996; Romme *et al.*, 1995). Romme *et al.*, (1995) recommended six roost trees greater than nine inches dbh per acre as optimum for Indiana bats, recognizing that males will roost in trees as small as four inches dbh.

Results of radio telemetry studies of Indiana bats in Michigan indicate that distance between roost trees ranged from 23 feet (7 m.) to 2.5 miles (4.1 km) (Kurta *et al.*, 1996). Actual distance traveled by most bats when changing roost trees was generally less than 0.62 miles (1 km); however, one move of 3.6 miles (5.8 km) was observed. Two bats banded in 1995 were recaptured in 1996 indicating fidelity to roosting areas in Michigan (Kurta *et al.*, 1996).

Macrohabitat and microhabitat variables were measured at Indiana bat maternity sites in northern Missouri and at comparable sites where Indiana bats were not captured (Miller 1996). No significant differences in percent land cover of the major cover types (forest, row crop, and grassland) between the site types were noted. The lack of differences in measured variables between sites suggests that additional factors (other than those associated with habitat) may be responsible for Indiana bat decline in Missouri (Miller 1996). However, significantly more large diameter trees (dbh $\geq$12") were found where Indiana bats have been captured than at unsuccessful netting sites

(Miller 1996). On the other hand, Romme *et al.*, (1995) state that at least 30 percent forest cover across the landscape is optimal for Indiana bats.

Site fidelity, the tendency for individuals to return repeatedly to the same site, is documented for Indiana bats. They frequently use the same trees for the time that a tree provides suitable roosting cover, and within an individual's home range there are several roost trees. If one roost tree is lost or becomes unsuitable, there are others in the same vicinity that can be used. Callahan (1993) found that maternity colonies moved frequently between primary and alternate roosts depending on disturbance or climatic changes. He also noted that the bats were locating new roost sites into late summer. In Illinois, Gardner *et al.*, (1991) were concerned that disturbing roosts may cause bats to expend additional energy searching for new roosts at a time when the bat's energies should be used for rearing young. They found a high degree of within-season site fidelity to specific trees by individual bats. However, they found no evidence that bats necessarily returned to the same trees in subsequent years. As long as there is an ample supply of potential roost trees in an area, protecting those roosts being used in the current season should be sufficient to protect Indiana bats.

Researchers are still learning a lot about summer roosting habitat, and there appears to be variability throughout the bat's range. The existence of Indiana bats in a particular area may be governed by the availability of natural roost structures, primarily dead trees with loose bark. The suitability of any tree as a roost site is determined by 1) its condition (dead or alive), 2) the quantity of loose bark, 3) the tree's solar exposure and location in relation to other trees, and 4) the tree's spatial relationship to water sources and foraging areas (USDI-FWS 1999a).

Foraging Habitat

Indiana bats prefer to forage in the upper canopy layers of forests where the degree of overstory canopy ranges between 50 and 70 percent closure. Some foraging also takes place over clearings with early successional vegetation, along the forested borders of agricultural fields, and along strips of trees extending into more open habitats (Romme *et al.*, 1995).

Indiana bats fitted with radio transmitters in the spring of 1994 in Missouri traveled up to 6.2 miles from their release site. Foraging areas of the female Indiana bats (n=2) averaged 844 acres. Foraging ranges of the male Indiana bats (n=4) averaged 6,837 acres (Humphrey *et al.*, 1977). These foraging ranges are considerably larger than those reported by Gardner *et al.* (1991) in Illinois. Home ranges in Illinois were reported to be 129 acres for pregnant females, 236 acres for lactating females, 532 acres for post-lactating females, 92.5 acres for juvenile females, 143 acres for adult males, and 71 acres for juvenile males (Garner and Gardner 1992).

Streams, wetlands, small ponds, and even road ruts provide drinking water for Indiana bats as they forage during the summer months.

Hibernacula

Indiana bats hibernate in caves or abandoned mines generally between October and April. Indiana bats have specific microclimate requirements (temperature and humidity) for winter hibernation sites. Less than one percent of the caves and mines within the range of the species are estimated to offer suitable hibernating conditions (Gardner *et al.*, 1991; USDI-FWS 1999a). Cave gates that restrict airflow may be partly responsible for the decline of Indiana bat populations.

Male Indiana bats often remain near the hibernaculum in the spring when they emerge from hibernation. Hobson (1993) found six male Indiana bats among a sampling of 198 bats in the vicinity of a known hibernaculum in Virginia. A subsequent study of Indiana bats in Virginia reports that one male radio-tracked for two weeks following departure from the hibernaculum, foraged and roosted in the vicinity of the hibernaculum (Hobson and Holland 1995).

The Pennsylvania Game Commission has completed extensive bat surveys of known caves throughout Pennsylvania. The abandoned mine at Canoe Creek State Park (75 miles southeast of the ANF) contains the largest known hibernaculum of Indiana bats in Pennsylvania (PGC 1995 unpublished). During January of 2000, Pennsylvania Game Commission biologists discovered about 60 Indiana bats in an abandon limestone mine in

Armstrong County approximately 50 miles from the ANF. Also during the winter of 2000, Indiana bats were discovered in a turnpike tunnel and another small cave in southwestern Pennsylvania (Cal Butchkowski, pers. comm.).

The ANF is unglaciated and, consequently, has few caves suitable for hibernation of Indiana bats. Mist netting and anabat detection at known caves near Hearts Content and near Marshburg have not revealed the presence of any Indiana bats. As new caves are discovered, biologists will survey them to determine what bats are present.

Swarming Habitat

Prior to entering the hibernaculum in the fall, bats swarm near the entrance. This swarming activity is related to mating and may continue for several weeks. Studies of fall swarming activity have shown that Indiana bats arrive at hibernacula as early as September, and continue to roost in nearby trees throughout October (Kiser and MacGregor 1997). During this time, Indiana bats are building fat reserves for the winter.

Habitat Evaluation Factors used on the ANF

The Habitat Suitability Index Model (Romme *et al.,* 1995) as modified in the T&E BA (12/98, pp. 19 -21) is used as the basis for evaluating habitat conditions on the ANF. Further modification for ANF evaluation factors were made during consultation with FWS in the summer of 1999. Vegetative conditions can be evaluated against criteria that define suitable habitat and optimum habitat (T&E BA 12/98, Appendix E, p. 3). Three kinds of habitat are evaluated - summer maternity landscape habitat, maternity roost habitat and foraging habitat. Evaluations for male roost habitat are not made. If conditions for summer maternity roost habitat are met, then conditions for male roost habitat are met, as well.

Summer maternity landscape habitat can be described by determining what portion of an area is in a forested condition, at what level of canopy closure. Summer maternity roost habitat is described by the distribution of live and dead trees by diameter class. Table 2 displays the criteria for these habitat elements.

Table 2. Description of Summer Maternity Landscape and Roost Habitat for Indiana Bat on the ANF

	Suitable	Optimum
Maternity Landscape Habitat	Minimum 5% forested cover	Minimum 30% forested cover
	16-53%, or > 80% canopy closure	54-80% canopy closure
Maternity Roost Habitat	**Live Trees**	**Live Trees**
	@ least 8 - 15 trees per ac ≥ 9" dbh	@ least 16 trees per ac ≥ 9" dbh
	@ least 1 tree per ac ≥ 20" dbh	@ least 3 trees per ac ≥ 20" dbh
	Dead Trees	**Dead Trees**
	@ least 3 trees per ac ≥ 9" dbh; of these, 1 tree per 10 ac ≥ 12" dbh	@ least 5 trees per ac ≥ 9" dbh; of these, 1 tree per 2 ac ≥ 20" dbh

Foraging habitat is described only in terms of canopy closure. Slightly different thresholds of canopy closure are used to distinguish roost habitat from foraging habitat. Table 3 displays the definitions used to describe summer roost and foraging habitat based on canopy closure.

Table 3. Description of Summer Indiana Bat Roost and Foraging Habitat on the ANF - Canopy Closure Criteria

Habitat Description	Summer Roost Habitat Criteria	Foraging Habitat Criteria
Openings	Overall, less than suitable condition. Scattered trees are present that could be used for roost purposes.	Overall, less than suitable condition, however surveys on the ANF indicate openings are used for foraging.
Seedling/Sapling Stands	Overall, less than suitable condition. Reserve trees and clumps are present that could be used for roost purposes.	Overall, less than suitable condition. Reserve trees and clumps are present that provide minimal habitat requirements.
Suitable habitat - Open crowns	Forested stands with <50% canopy closure. Forest average dead and live tree distributions apply.	Forested Stands with < 50% canopy closure. Forest average dead and live tree distributions apply.
Optimal habitat	Forested stands with 50-80% canopy closure. Forest average dead and live tree distributions apply.	Forested Stands with 50-70% Canopy Closure. Forest average dead and live tree distributions apply.
Suitable habitat - Closed crowns	Forested Stands with > 80% Canopy Closure. Forest average dead and live tree distributions apply.	Forested stands with > 70% canopy closure. Forest average dead and live tree distributions apply.
Unclassified	Insufficient data to quantify.	Insufficient data to quantify.

The ANF in Context with a Larger Scale of Analysis

The ANF is part of a larger forested landscape that can be evaluated for Indiana bat habitat. Statewide inventory data collected by the Forest Inventory and Analysis Unit of the Northeastern Research Station shows that 17 million acres of Pennsylvania are forested, with sawtimber-sized forests found across 54 percent of the State (Alerich 1993a). There are over 2.4 billion live trees and over 303 million dead trees found within the Commonwealth. With 95 percent of the ANF found to be in a forested condition, and 78 percent in sawtimber-sized condition, higher than average numbers of trees per acre (both living and dead) are found on the ANF than for Pennsylvania as a whole (Alerich 1993b).

Forest-wide Distribution of Habitat

Virtually every acre of the ANF contributes in some way towards maternity landscape/roost habitat and foraging habitat; however, some acres provide more beneficial habitat conditions than others. Three analyses completed in 1998 were used to understand the quality and quantity of habitats across the ANF. Additional details are contained on pages 38-39 of the T&E BA (12/98) and Appendix E (USDA-FS, 1998) and on pages 66-68 of the BO (USDI-FWS, 1999b). Numbers presented here have been updated based upon the most recent vegetation surveys and local research regarding habitat evaluations (deCalesta and Ordiway, pers. comm.) that pertain to Indiana bat. Pertinent findings of these analyses include:

- Both landscape level and stand level conditions should be considered in the evaluation of habitat conditions. Scale of evaluation is a critical factor.
- Assessment of maternity landscape habitat includes an evaluation of the distribution of acres between different levels of canopy closure. Maternity roost habitat consists of an evaluation of the distribution of dead and live trees that serve as potential roost habitat.

- There are currently over 187,600 acres of maternity landscape habitat in an optimal condition (37% of the ANF). As time passes, stand growth will occur, canopy closures will increase, and these acres will return to a suitable condition.
- The distribution of live trees that contribute towards maternity roost habitat meet optimal habitat conditions, and are found across 73 percent of the ANF. The distribution of dead trees meets a mix of optimal and suitable habitat conditions. Optimal distribution of dead trees $\geq$ 9" diameter is found on 38% of the ANF. Suitable distribution of larger diameter ($\geq$12 inch) trees is found on 28% of the ANF.

- Assessment of foraging habitat consists of an evaluation of the distribution of acres between different levels of canopy closure.
- There are over 99,400 acres of foraging habitat in an optimal condition (19% of the ANF). As time passes, stand growth will occur, canopy closures will increase, and these acres will return to a suitable condition.

Clubshell Mussel and Northern Riffleshell Mussel

The Clubshell mussel (*Pleurobema clava*) and Northern Riffleshell mussel (*Epioblasma torulosa rangiana*) were listed as endangered on February 22, 1993 (50 CFR 17). A Recovery Plan was drafted in September 1993 (Watters 1993)

Distribution

Both of these freshwater mussels were widespread throughout most of the Ohio and Maumee River drainages prior to 1800, and the Clubshell appears to have been very common. Both species now exist in 8 to 10 isolated populations each, most of which are small and peripheral. The largest remaining population of the Clubshell is in the Tippecanoe River in Indiana, while that of the Northern Riffleshell is in French Creek, Pennsylvania (Watters, 1993).

Historical and present occurrences of the Clubshell and Northern Riffleshell mussels in the Allegheny River are presented in Table 4 (Watters, 1993).

In 1989, the ANF entered into a challenge cost share agreement with the Western Pennsylvania Conservancy to survey for mussels near the seven Federally-designated wilderness islands in the Allegheny River within the ANF. Both the Clubshell and Northern Riffleshell were found with a total of 16 different mussel species being documented (WPC, 1989).

Table 4. Historical (H) and Present (P) Occurrences of the Clubshell and Northern Riffleshell in the Allegheny River Basin (Watters, 1993; USDI-FWS, pers. comm.)

General Locality	State	Clubshell	Riffleshell
Raccoon Creek	PA	H	
Conemaugh River	PA	H	
Loyalhanna Creek	PA	H	
Buffalo Creek	PA	H	
Sandy Creek	PA	H	
French Creek	PA	P	P
Conneaut Outlet	PA	P	
Conneauttee Creek	PA	P	
LeBouef Creek	PA	P	P
Conewango Creek	PA		H
Muddy Creek	PA	P	

In 1994, the ANF entered into a second challenge cost share agreement with the Western Pennsylvania Conservancy and Carnegie Museum of Natural History to survey for mussels in 10 tributaries of the Allegheny River within the National Forest. These tributaries include Tionesta Creek, South Branch Tionesta Creek, West Branch Tionesta Creek, East Branch Tionesta Creek, Salmon Creek, Minister Creek, Kinzua Creek, South Branch Kinzua Creek, Sugar Run, and East Hickory Creek. Only 2 of the 10 streams contained mussels, Tionesta Creek and West Branch Tionesta Creek. Nine species of mussels were documented, but neither the Clubshell nor Northern Riffleshell was found (Bier *et al.,* 1997).

Reproduction

The breeding season for North American freshwater mussels is initiated by changes in water temperature. Generally there is one breeding season a year. Abnormally low water temperatures may delay reproduction (Watters 1993).

Typically, sexes are separate, although small numbers of hermaphrodites have been found in most populations (Heard 1979). Females move unfertilized eggs into specialized regions of the gills, called marsupia. The males liberate sperm into the water and downstream females take up the sperm with incoming water. Eggs are fertilized in the marsupia and small larvae called glochidia develop over a period of days to months (Watters 1993).

When these glochidia come in contact with a vertebrate host, usually a fish, they attach to the gills, fins, or skin. After a certain amount of time, depending on water temperature, the glochidia transforms to a juvenile and releases from the host and burrows into the substrate. The hosts for both the Clubshell and Northern Riffleshell are unknown (Watters 1993).

Food Habits

Freshwater mussels are filter feeders. Oxygen and food are acquired across an extensive gill surface, and metabolic waste is released into the surrounding water. The food of freshwater mussels has been the subject of debate. Diatoms, algae, bacteria, protozoans, and organic particles are believed to be some of the food items eaten by mussels.

Habitat

The Clubshell is generally found in clean, coarse sand and gravel in runs, often downstream of a riffle. It cannot tolerate mud or slackwater conditions. The Northern Riffleshell also occurs in packed sand and gravel in riffles and runs (Watters 1993).

Habitat on the Allegheny National Forest

As previously mentioned, the Allegheny River is the only place within the ANF proclamation boundary where these two mussels have been found. Although the entire river within the boundaries of the ANF has not been surveyed, it is considered potential habitat.

Surveys of 10 tributaries of the Allegheny River did not reveal the presence of either the Clubshell or Northern Riffleshell. Since tributaries such as French Creek contain both of these endangered mussels, some speculation as to why this paucity of mussels in ANF tributaries has occurred. Bier *et al.,* (1997) suggest, "ANF streams are generally less buffered, more acidic, medium to high gradient and colder than optimum for mussels."

Causes of Past/Current Decline and Potential for Future Decline

Since mussels are sedentary, they are extremely susceptible to environmental degradation. The range reductions of both of these mussels are attributed to physical loss of habitat and degraded water quality related primarily to water impoundments, channelization, streambank clearing, and agricultural runoff. Impacts associated with run-off from human waste, chemical outfalls, and coal mining have also affected many tributaries. Increased turbidity and suspended sediments can result in increased water temperatures, decreased oxygen levels, and siltation.

Smothering from siltation, in turn, decreases or eliminates the mussels' ability to breathe, feed, and reproduce. Impacts to fish species composition can also affect reproduction since a fish host is an integral component of the mussel's reproductive cycle (Federal Register 1993)

Neither the Clubshell mussel nor the Northern Riffleshell mussel is commercially valuable; therefore, although they could be taken during black market collecting of shells, they are not the targets of collection, so this threat is minimal.

Natural predation by muskrats, river otters, and freshwater drum is known to occur. When these mussels were abundant and widespread, the impact of this predation was negligible. However, at the present time, their greatly reduced distribution and populations have made them susceptible to predators, especially muskrats (Federal Register 1993).

The exotic, prolific Zebra mussel (*Dreissena polymorpha*), accidentally introduced to North America in the mid 1980s, poses a severe threat to all native mussel species through the competition for space, food, and survival of glochidia. Zebra mussels are abundant in Lake Erie and are present at Lock 7 in the Allegheny River. Zebra Mussels are present in Chautauqua Lake (NY), which flows into Conewango Creek and then into the Allegheny River at Warren (Mike Fowles, pers. comm.).

CHAPTER 2 - ALTERNATIVES, INCLUDING THE PROPOSED ACTION

DEVELOPMENT OF THE PROPOSED ACTION

Development of The Proposed Action

The proposed action was developed by examining the Forest Plan, the BO, the ANF Conservation Program, and scoping comments to determine which items would be most appropriately addressed by amending the Forest Plan. This resulted in some changes and refinements in the proposed action as described in the Notice of Intent.

The first step was to examine the Forest Plan to determine what existing management direction pertains to T&E species. A review of existing standards and guidelines (S&G's), and monitoring plan requirements shows that considerable attention is given to T&E species needs within the existing direction. Specific direction for T&E species and Forest Species of Special Concern is found on pages 4-35 through 4-39 of the Forest Plan. Additionally, standards and guidelines that relate to T&E species are found throughout the plan. Table 5 displays the standards and guidelines that are most pertinent to T&E species.

Table 5. Existing Forest Plan Standards and Guidelines pertaining to T&E Species

Disposition	Forest Plan Citation	Page #
	Forest-Wide Standards and Guidelines	
Revise	Indiana Bat *(Myotis sodalis)**	4-35
	* Though this species has not been recorded as occurring within the Allegheny National Forest, its historic and suspected range includes this area. Old growth habitat in riparian areas preferred by this species for nursery colonies will be provided through implementation of the standards and guidelines as well as the management area assignments.	& 4-36
Retain	The Forest will carry out National Forest responsibilities in Recovery Plans for federally threatened and endangered species and will develop management plans for all federal and state threatened and endangered species, except for migrants or visitors, that are essentially unaffected by management of the Forest. Direction will include the following requirements:	4-37
	2. Assess the occurrence of animal and plant species in all areas to be affected by land adjustments or resource management activities, and design actions to avoid, minimize, or mitigate potential adverse impacts.	
	4. Protect specific key habitats and specialized habitats through coordination with other resource activities or area closures.	
Retain	Vegetative Management Retain hickory and black gum in stands where they occur naturally.	4-6
Retain	Snags A snag can be either a dead tree or a live tree with a dead crown or major dead limbs. Wildlife will use a wide variety of tree species. High value timber species should not be designated as snags, except where salvage sales are not feasible.	4-32

Disposition	Forest Plan Citation	Page #
	Some snags should be left standing in all commercial and non-commercial cuts. Where the potential exists, leave an average of five to ten snags per acre. In clear-cut, snags will be left primarily in hollows and along stand borders where they will be less subject to blowdown. Refer to the guidelines in the 1900 section for each Management Area for more specific direction.	4-32
	Management Area Direction	
Retain	*Management Areas 2 and 6.1* Retain the following snags per acre: 10" to 16" dbh 3 snags 18" to 24" dbh 3 snags Greater than 24" dbh 3 snags	4-73 & 4-113
Retain	***Management Areas 3, 6.2, and 6.3*** Retain 5 snags per acre greater than 10 inches dbh.	4-85 4-128 4-141
	Den Trees	4-32
Retain	As part of the requirement for providing old growth habitat, retain in intermediate cuttings up to three trees per acre with nesting cavities unless the guidelines for the Management Area exceed the forest-wide guideline. Where an inadequate number of live trees occur, retain old large trees, especially those with old wounds and broken limbs. In clear-cut, leave small clumps of 6-15 trees with nesting cavities, trees with the potential to produce nesting cavities along with adjacent conifers and mast-producing species. These clumps should be left in hollows and along stand borders where they are less subject to blowdown. Where this is not feasible, retain a clump of approximately 75 trees (1/4 acre) within each five acres of regeneration cut. The clumps should not exceed five percent of the area to be regenerated.	
Retain	*Management Area 2* Provide three to five trees with nesting cavities per acre, with a minimum dbh of 14 inches.	4-79
Retain	*Management Areas 6.1, and 6.2.* Provide three to five live trees per acre with nesting cavities and having a minimum dbh of 14 inches for cavity nesting birds and mammals.	4-121 4-135
Retain	*Management Area 3* Provide four to six live den trees per acre with a minimum dbh of 14 inches in the oak type.	4-93

Disposition	Forest Plan Citation	Page #
	Forest-Wide Standards and Guidelines	
	Riparian Area Management	4-19
Retain	Preferential consideration will be given to riparian dependent resources in riparian areas and in the area 100 feet from either edge of perennial streams and other water bodies. Riparian dependent resources include, but are not limited to wildlife habitat, fish habitat, recreation opportunities, and water quality.	
Retain	Management objectives for perennial streams are to: - provide a sufficient number of biologically mature trees growing along streams to provide for long-term input of large woody material.	4-19a
Retain	A canopy of high and/or low shade should be provided along perennial streams.	4-25
	Forest-Wide Standards and Guidelines	
	Old-growth Management	
Retain	*Management Area 2* - Old growth habitat should be a component of each stand (tree age greater than or equal to pathological rotation).	4-73
Retain	*Management Area 3* - Old growth habitat timber at pathological rotation or older should be provided on a minimum of 5 percent of the area.	4-85
Retain	*Management Area 6.1* - The emphasis in this management area is to provide a land condition with vegetation predominantly made up of mature or over-mature hardwood forests.	4-110
Retain	Old growth habitat should be provided on a minimum of 10 percent of the area and should comprise at least 100 of each 1,000 acres.	4-113
Retain	*Management Area 6.2* - Old growth habitat (timber at pathological rotation and older) will be provided on a minimum of five percent of the area.	4-128
Retain	*Management Area 9.1* - The areas managed under this goal will provide "old growth" stands of oak, sugar maple, beech, and hemlock.	4-180
	CLUBSHELL MUSSEL AND NORTHERN RIFFLESHELL MUSSEL - NOTE - Although the Clubshell mussel and Northern Riffleshell mussel were not listed as endangered at the time the Forest Plan was completed, there are several Forest Plan standards and guidelines directed at maintaining water quality and controlling sedimentation that benefit these mussels. Also, a Forest Plan amendment for fisheries management was completed in 1997 that provides additional guidelines that benefit mussels. Forest Plan standards and guidelines meet or exceed Pennsylvania's Best Management Practices for addressing the control of non-point source pollution (sedimentation). The following is a review of the significant standards and guidelines to protect water quality and reduce sedimentation:	

Disposition	Forest Plan Citation	Page #
	Forest-Wide Standards and Guidelines	
	Coordination of Water Resources with Timber Management	4-23
Retain	Temporary roads and skid trails will be cross-drained to prevent erosion and sedimentation into streams. After use, all facilities including landings should be permanently closed and erosion controlled.	
Retain	Landings should be located and designed so that sediment will settle out before runoff reaches watercourses.	4-24
Retain	Sale layout will avoid, to the extent practical, the need for skidders to cross perennial and intermittent streams. Crossing by skidders will occur only at designated sites. A temporary crossing will be constructed to prevent degradation of stream banks and bed. No skidding or trucking is permitted down any portion of any stream or streambank.	4-24
Revise	Concerning perennial and intermittent streams: - A filter strip should be maintained to minimize the movement of silt, humus, and other organic matter into the stream. A suggested width is 50 feet plus 2 feet for every one percent of slope adjacent to each side of the stream or the actual size of the riparian area, whichever is larger.	4-24
Retain	- Logging operations should maintain the existing structure and shape of stream banks. This includes maintaining trees that are providing stream bank stability, trees growing within the channel, and trees that have a high potential for providing in-stream woody material.	4-24
Retain	- A canopy of high and/or low shade should be provided along perennial streams. This should protect the streams from excessive exposure to direct sunlight that would increase temperatures above that tolerable to the existing fish species. For cold-water streams, water temperatures should have an average daily maximum less than or equal to 68 degrees Fahrenheit.	4-25
Retain	No herbicide will be sprayed on any stream or spring seep. The following buffer strips will be established for all spray projects using ground application equipment: - a 75-foot buffer will be maintained along perennial streams, intermittent streams that have flowing water on the day of spraying, and impoundments or lakes. - a 50-foot buffer will be maintained along intermittent streams not flowing water, and spring seeps that drain into streams. - a 25-foot buffer will be maintained around small seep areas that do not have an outflow channel draining to a stream.	4-25
	Coordination of Water Resources with Recreation Management	4-25
Retain	New ORV trails should be constructed outside of the riparian area (save crossings) and where an effective filter strip is present to prevent sediment from entering a stream course. The type of trail surfacing material to be used will depend on how effective the filtering capability of a filter strip is.	

Disposition	Forest Plan Citation	Page #
Retain	For existing ORV trails that have been identified as contributing sediment to a perennial or intermittent stream, a surfacing material that would reduce sediment to a stream course should be used.	4-25
Retain	Trails will be cross-drained to prevent erosion and sedimentation into streams. Trail runoff should not directly enter a perennial or intermittent stream or spring.	4-25
	Coordination of Water Resources with Oil and Gas Management	4-28
Retain	Developers will provide an erosion and sediment control plan to the Forest Service prior to construction.	
Retain	Surface disturbance will be limited to the minimum necessary for extraction of minerals, as stipulated by the Secretary's Rules and Regulations governing reserved minerals or by case law concerning outstanding mineral rights.	4-28
Retain	Although some new roads will require stream crossings, road and pipeline systems will be planned to avoid or eliminate the crossing of perennial streams whenever reasonably possible. Operators will design and construct stream crossings such that detrimental impacts to the stream are reduced or minimized.	4-28
Retain	It is the operator's responsibility to comply with all state and federal water pollution abatement laws and regulations.	4-28b
Retain	Wastewaters will be disposed of by methods approved by state and federal regulatory agencies.	4-28b
Retain	Coordination of Water Resources with Transportation	4-26
	An engineering guide titled "*Guidelines for Road Design in Proximity to Streams*" will be used to address the "how-to" for several of the standards in the Forest Plan addressing sediment reduction (Appendix F).	
Retain	The suggested distance between new roads and perennial and intermittent streams would be beyond the riparian area and where an effective filter strip is present to prevent sediment from entering a stream course. The type of road surfacing material to be used will depend on how effective the filtering capabilities of the filter strip are.	4-26
	Management Area Direction	
	Management Area 6.1	
	Riparian area management includes the riparian zone and the riparian zone of influence.	4-118a

Disposition	Forest Plan Citation	Page #
Retain	Perennial Streams Along perennial streams, streamside management zones would be established to meet fisheries and wildlife management objectives. The distances are for each side of the stream and could be located within the wider riparian area. Stream Width — Streamside Management Zone Defined stream channel <10' — 75' + 2'/1% slope Defined stream channel >10' — 100' + 2'/1% slope	4-118a
Retain	Intermittent Streams Intermittent streams within the corridor should be managed to: Maintain trees that are providing streambank stability. - Maintain trees growing within a stream channel for stability purposes. - Provide for continued input of leaf litter (intermittent streams transport leaf litter by periodic flushings into downstream reaches of perennial waters, as well as provide habitat for aquatic invertebrates within these intermittent channels. - Continue with the current Forest Plan standard and guideline of a suggested filter strip width during timber harvesting of 50' +2'/1% slope or the actual size of the riparian area, whichever is larger.	4-118a 4-118b
	During consultation with the FWS on the *Allegheny Wild and Scenic River Management Plan* both agencies agreed that: *"A mussel survey will be conducted prior to the installation of any new access sites (that are federally funded or on federal land) that may impact water quality and/or the river bottom. If endangered mussels occur within the project impact area, consultation with the U. S. Fish and Wildlife Service will occur."*	*Allegheny W&S River Mgmt. Plan, as amended to the Forest Plan*
	BALD EAGLE - In 1986, when the Forest Plan was approved, no Bald eagles were known to nest on the ANF; however, standards and guidelines were provided to protect nesting sites should any be found. Since then, a fisheries Forest Plan amendment (December 1996) and an Allegheny Wild and Scenic River amendment (September 1997) have been approved that strengthen Forest Plan guidelines for riparian areas and intermittent streams (see standards and guidelines under Clubshell mussel and Northern Riffleshell). Preferential consideration is given to riparian-dependent resources in riparian areas and in the area 100 feet from either edge of perennial streams and other water bodies. Riparian-dependent resources include, but are not limited to, wildlife habitat, fish habitat, recreation opportunities, and water quality.	

Disposition	Forest Plan Citation	Page #
	Forest-Wide Standards and Guidelines	
Retain	The Forest will carry out National Forest responsibilities in Recovery Plans for federally threatened and endangered species and will develop management plans for all federal and state threatened and endangered species, except for migrants or visitors, that are essentially unaffected by management of the Forest. Direction will include the following requirements:	4-37
Retain	8. Identify and manage potential nest trees in suitable locations for the Bald eagle and osprey.	4-37
Revise	10. The guidelines to protect selected birds during the nesting season are the following: - Prohibit disturbances within approximately 330 feet of each existing nesting location, except those necessary to protect the nest or colony. - Prohibit significant changes in the landscape within 660 feet of each existing nesting location. - Restrict management activities* that result in adverse disturbance to nesting birds within approximately 1,320 feet of each nest location. - Local roads will be closed to the public where active nests are located.	4-38
	The species included here and their critical time periods are the following: Bald Eagle – February 1 to July 31 Osprey – May 1 to August 15 Cooper's Hawk – March 1 to July 31 Red-shouldered Hawk – March 1 to June 30 Northern Goshawk – April 1 to July 31 Sharp-shinned Hawk – April 15 to August 15 Great Blue Heron – March 1 to August 31 Raven – February 1 to May 15 * Includes road and trail construction and maintenance, timber cutting and hauling, oil and gas development (where possible), rights-of-way management, etc.	4-38
Retain	12. New roads, trails, recreation facilities and other developments will be located to avoid the following: - Potential nesting sites for the Bald eagle and osprey	4-38 & 4-39
Retain	15. The Forest will not pursue a Bald eagle hacking project during the first plan period based on consultation with Pennsylvania Game Commission wildlife biologists. If another organization or agency decides to initiate one based on additional data, we will cooperate to the extent possible through habitat management and coordination with other resource management activities. Our current objective is to establish one nesting pair of Bald eagles on the Forest by the year 2020.	4-39

Disposition	Forest Plan Citation	Page #
	SMALL WHORLED POGONIA - Although no Small whorled pogonias have been found on the Allegheny National Forest, provisions to survey for this orchid are contained in the Forest Plan.	
Retain	The Forest will carry out National Forest responsibilities in Recovery Plans for Federally threatened and endangered species and will develop management plans for all federal and state threatened and endangered species, except for migrants or visitors, that are essentially unaffected by management of the Forest. Direction will include the following requirements:	4-37
Drop (Include in Monitoring Plan)	13. Field surveys will be conducted to determine the presence of Small whorled pogonia populations when road construction, logging, herbicide treatment, trail construction, recreation development, and oil and gas development are proposed for areas containing suitable habitats for this species.	4-39

The second step was to examine the findings of the BO and determine what kind of action is needed in order to meet the requirements found in the BO. There were three possibilities considered for disposition – a) amend the Forest Plan with a new or revised standard or guideline, and/or modify the monitoring plan; b) consider as an alternative in this analysis; and c) implement under existing Forest Plan direction. A direct comparison between the BO and the Forest Plan (found in Appendix B) shows that most of the requirements of the BO are either addressed by existing standards and guidelines, or are administrative or operational actions and therefore can be implemented under current Forest Plan direction. There are five items from the BO that are used to generate new or revised standards and guidelines, and two that are used to generate the proposed action and an alternative in this analysis. Note that the BO does not include specific terms and conditions for Indiana bat maternity sites. Additional consultation will be needed if a maternity site is discovered.

The third step was to compare Forest Plan S&G's with the elements of the ANF CP (Appendix A). There was some overlap in this step with the previous comparison made between the BO and the Plan, given the fact that the ANF CP includes the requirements of the BO, as well as additional actions that the ANF chooses to take to conserve T&E species. This step generates the complete list of new and modified standards and guidelines and changes to the monitoring plan that are included in the proposed action.

The fourth step was to review comments received in scoping to see if additions to the proposed action should be made. No changes were identified (see Appendix C for disposition of scoping comments).

The final step was to write the new S&G's included in the proposed action.

Table 6 displays the applicable existing S&G (if one exists), its disposition (retain, revise or drop), and the rewritten or new S&G that makes up the proposed action.

Table 6. Applicable Existing Standards and Guidelines, Their Disposition, and Proposed Changes or Additions

Forest Plan Page #	Applicable Existing Standard and Guideline and Disposition	Modification to Existing Standard and Guideline or Proposed New Standard and Guideline
		Bald Eagle
		Habitat Protection And Enhancement
4-38	1. The guidelines to protect selected birds during the nesting season are the following: - Prohibit disturbances within approximately 330 feet of each existing nesting location, except those necessary to protect the nest or colony - Prohibit significant changes in the landscape within 660 feet of each existing nesting location. - Restrict management activities* that result in adverse disturbance to nesting birds within approximately 1,320 feet of each nest location. - Local roads will be closed to the public where active nests are located. The species included here and their critical time periods are the following: Bald Eagle - February 1 to July 31. Osprey – May 1 to August 15 Cooper's Hawk – March 1 to July 31 Red-shouldered Hawk – March 1 to June 30 Northern Goshawk – April 1 to July 31 Sharp-shinned Hawk – April 15 to August 15 Great Blue Heron – March 1 to August 31 Raven – February 1 to May 15 * includes road and trail construction and maintenance, timber cutting and hauling, oil and gas development (where possible), rights-of-way management, etc. DISPOSITION – Drop existing reference to Bald eagle. Revise existing S&G for Bald eagle as stated in #1 in next column.	*1. The following buffer zones and time of year restrictions shall apply to Bald eagle nests, including those abandoned for ≤ 3 years*:* *a. Year-round, all activities that may disturb eagles or significantly alter habitat including, but not limited to, timber harvesting, land clearing, federal oil and gas development, road construction and operation, and trail construction and operation, shall be prohibited within a zone extending at least 660 feet from the nest. This prohibition does not apply to the implementation of measures that are necessary to protect or monitor the nest.* *b. From January 15 to July 31 of each year, people and aircraft (under Forest Service control) should not be allowed within 660 feet of the nest. This distance should be increased if topography and/or vegetation permit a direct line-of-sight from the nest to potential activities. This prohibition does not apply to qualified persons conducting necessary eagle research and management.* *c. From August 1 to January 14 of each year, hunting, fishing, and other recreational activities are allowable within 660 feet of the nest; however, these activities should be restricted within 330 feet of the nest.* *d. From January 15 to July 31 of each year restrict management activities that result in disturbance to nesting birds within approximately 1,320 feet of each active nest location. Examples of management activities that should be restricted include road and trail construction and maintenance, timber cutting and hauling and federal oil and gas development, etc.* **Abandoned nests include those nests abandoned for any reason (e.g. movement of adults, fallen nest tree, fallen nest, and damaged nest)* *STATUS – Revise existing S&G*

Forest Plan Page #	Applicable Existing Standard and Guideline and Disposition	Modification to Existing Standard and Guideline or Proposed New Standard and Guideline
4-37	8. Identify and manage potential nest trees in suitable locations for the Bald eagle and osprey. DISPOSITION – Retain S&G, add 2 - 4 in next column for more detailed nest tree requirements for Bald eagle.	*2. Three or more super-canopy trees should be identified and maintained within one-quarter mile of each nest as roosting and perching sites. These trees may be large white pines, dead deciduous trees, or trees with dead or broken tops.* *3. On the side slopes surrounding the Allegheny Reservoir and on the side slopes along the Allegheny River, Tionesta Creek, Clarion River, Kinzua Creek, and Salmon Creek maintain scattered white pines and other trees with potential for use as nesting or roosting trees. Consider not only trees that are super-canopy trees but also trees that may provide nesting or roosting sites in the future, such that a sustainable supply will be available.* *Abandoned Nest Trees* *4. When a nest is classified as a remnant, that is, one that has been unoccupied for five consecutive years, and is not being maintained by eagles, retain only the 330-foot buffer zone. Prohibit disturbances within this buffer zone as stated in #1.* *STATUS – New S&G*
		Roosting Areas *5. Bald eagle roosting areas shall be identified and protected Activities that may result in the incidental take of roosting eagles or degradation of roosting habitat shall be restricted within 0.25 mile (1,320 feet) of identified roosting sites.* *STATUS – New S&G*
		Indiana Bat
		Habitat Protection and Enhancement
4-36	**INDIANA BAT** - Though this species has not been recorded as occurring within the Allegheny National Forest, its historic and suspected range includes this area. Old growth habitat in riparian areas preferred by this species for nursery colonies will be provided through implementation of the standards and guidelines as well as the management area assignments	*6. This species was found to occur within the Allegheny National Forest in August 1998. Summer roost and foraging habitat is found in great abundance throughout the ANF. Habitat for this species will be provided through implementation of standards and guidelines. The following standards and guidelines provide specific diameter requirements for live and dead trees that provide habitat*

Forest Plan Page #	Applicable Existing Standard and Guideline and Disposition	Modification to Existing Standard and Guideline or Proposed New Standard and Guideline
	DISPOSITION – Revise this statement as stated in next column.	*for Indiana bat. Trees retained to fulfill snag and den tree requirements (see Forest Plan, p. 4-32) can also be counted towards these requirements.* *STATUS – Revised statement*
4-32	Snags A snag can be either a dead tree or a live tree with a dead crown or major dead limbs. Wildlife will use a wide variety of tree species. High value timber species should not be designated as snags, except where salvage sales are not feasible. Some snags should be left standing in all commercial and non-commercial cuts. Where the potential exists, leave an average of five to ten snags per acre. In clear-cuts, snags will be left primarily in hollows and along stand borders where they will be less subject to blowdown. Refer to the guidelines in the 1900 section for each Management Area for more specific direction. Den Trees As part of the requirement for providing old growth habitat, retain in intermediate cuttings up to three trees per acre with nesting cavities unless the guidelines for the Management Area exceed the Forest-wide guideline. Where an inadequate number of live trees occur, retain old large trees, especially those with old wounds and broken limbs. In clear-cuts, leave small clumps of 6-15 trees with nesting cavities, trees with the potential to produce nesting cavities along with adjacent conifers and mast-producing species. These clumps should be left in hollows and along stand borders where they are less subject to blowdown. Where this is not feasible, retain a clump of approximately 75 trees (1/4 acre) within each five acres of regeneration cut. The clumps should not exceed five percent of the area to be regenerated. DISPOSITION – Retain these S&G's for Indiana bat and other	*7. For both partial and final harvests in green units (harvested material consists primarily of live, healthy trees) retain all snags. Retain at least 8-15 live trees ≥9 inches d.b.h. per acre in final harvest units, and at least 16 live trees ≥9 inches d.b.h. per acre in partial harvest units.* *8. For both partial and final harvests in salvage units (dead or dying trees make up 50 percent or more of the harvested volume), and clear-cut, retain at least 5-10 snags ≥9 inches d.b.h. per acre, and of these one snag ≥16 inches d.b.h. per two acres. Also retain at least 16 live trees ≥9 inches d.b.h. per acre, and 3 live trees ≥20 inches d.b.h. per acre in partial harvest units; and retain at least 8-15 live trees ≥9 inches d.b.h. per acre, and 1 live tree ≥20 inches d.b.h. per acre in final harvest units and clear-cut.* *9. Live residual trees to be retained under these terms and conditions shall, where available, be Class 1 or Class 2 trees (as identified by Romme et al., 1995), or other trees exhibiting or likely to develop characteristics preferred by Indiana bats (e.g., exfoliating bark).* *10. Designate and retain living residual trees in the vicinity of about 1/3 of all large diameter (≥ 12 inches d.b.h.) snags with exfoliating bark to provide them with partial shade in summer.* *STATUS – New S&G's*

Forest Plan Page #	Applicable Existing Standard and Guideline and Disposition	Modification to Existing Standard and Guideline or Proposed New Standard and Guideline
	species. Add new S&G's that further define live and dead tree habitat requirements for Indiana bat.	
		11. *For partial/intermediate harvests (e.g., thinnings, shelterwood seed/prep, selection cuts) in healthy stands (stands where volume being removed is predominantly healthy, living trees), reduce canopy closure to >50 percent.** ***(Changed from >54% to >50% after discussion with FWS)*** *STATUS - New S&G*
		12. All known roost trees on the ANF will be protected until such time as they no longer serve as a roost (e.g., loss of exfoliating bark or cavities, blown down, or decay). In the event that it becomes absolutely necessary to remove a known Indiana bat roost tree, such a removal will be conducted through consultation with FWS, during the time period when the bats are likely to be in hibernation (November 15 through March 31). Trees identified as immediate threats to public safety may, however, be removed at any time following consultation with the FWS. *STATUS – New S&G*
		Protection of Individuals
		13. Demolition or removal of buildings or other man-made structures that harbor bats should occur while bats are hibernating. If public safety is threatened and the building must be removed while bats are present, a bat expert should examine the building to determine if Indiana bats are present. *STATUS – New S&G*

Forest Plan Page #	Applicable Existing Standard and Guideline and Disposition	Modification to Existing Standard and Guideline or Proposed New Standard and Guideline
		Clubshell Mussel And Northern Riffleshell Mussel
		Protection Of Individuals
		14. At the marina and boat launches on the Allegheny Reservoir, boats shall be screened for potential Zebra mussel contamination, and boats found through screening to be at risk shall be decontaminated using a FWS-approved decontamination method. These same procedures shall apply to commercial use of the boat launch at the Buckaloons Recreation Area on the Allegheny River. Screening and decontamination procedures are conducted in accordance with the Zebra mussel action plan (ANF CP), which is approved by the FWS and updated by agreement as needed. *STATUS – New S&G*
4-24	Concerning perennial and intermittent streams: A filter strip should be maintained to minimize the movement of silt, humus, and other organic matter into the stream. A suggested width is 50 feet plus 2 feet for every one percent of slope adjacent to each side of the stream or the actual size of the riparian area, whichever is larger. DISPOSITION – Revise this S&G as stated in the next column	*15. Concerning perennial and intermittent streams:* *A filter strip will be maintained to minimize the movement of silt, humus, and other organic matter into the stream. A suggested width is 50 feet plus 4 feet for every one degree of slope adjacent to each side of the stream or the actual size of the riparian area, whichever is larger.* *STATUS – Revise existing S&G*
4-39	13. Field surveys will be conducted to determine the presence of small-whorled pogonia populations when road construction, logging, herbicide treatment, trail construction, recreation site development, and oil and gas development are proposed for areas containing suitable habitats for this species DISPOSITION – Drop this S&G, modify monitoring plan to include requirements for small whorled pogonia (See Table 10).	

DEVELOPMENT OF ALTERNATIVES

Process used to Develop Alternatives

A major task in the completion of this analysis was the development of alternatives to the proposed action. In accordance with 40 CFR 1502.14, agencies shall:

1. Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives that were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.
2. Devote substantial treatment to each alternative considered in detail, including the proposed action, so that reviewers may evaluate their comparative merits.
3. Include reasonable alternatives not within the jurisdiction of the lead agency.
4. Include the alternative of no action.

The first step taken by the ID team in the development of alternatives was to identify environmental and social issues related to the proposed action. These issues were developed by analyzing the comments received through scoping (Appendix C), by addressing management concerns, by considering information contained in the BO, and by analyzing the comments received in response to the Draft EIS (Appendix F). The ID Team also considered the requirements of NEPA, NFMA and ESA in this process.

There were many issues raised in scoping that were extremely broad in nature. While the issues are important, the ID team determined that these issues are better addressed in an analysis that considers more resource actions than those proposed here. The ID team considered the following NEPA requirements in deciding how to address these broad issues:

> "(2) Identify and eliminate from detailed study the issues which are not significant or which have been covered in prior environmental review (1506.3), narrowing the discussion of these issues in the statement to a brief presentation of why they will not have a significant effect on the human environment or providing a reference to coverage elsewhere (40 CFR 1501.7(a)(2)."
>
> And
>
> "(5) Indicate any public environmental assessments and other environmental impact statements which are being or will be prepared that are related to but are not a part of the scope of the impact statement under consideration (40 CFR 1501.7(a)(5)."

Consideration of these two requirements led the ID team to the conclusion that several of the broad issues raised for this project were either covered in the analysis completed for the Forest Plan, or would be more timely to be addressed during Forest Plan revision. ANF personnel are currently gathering preliminary information in all resource areas that will be used in plan revision. The Forest Plan is scheduled to be revised beginning in 2002 or 2003.

Summary of Issues Used to Formulate Alternatives

The ID Team identified six issues that were used to formulate alternatives.

1. Provide management direction that minimizes take for Indiana bat, Bald eagle, Clubshell mussel and Northern Riffleshell mussel.
2. Reduce the risk of jeopardy for the Northern Riffleshell mussel by minimizing the risk of introduction of Zebra mussels at Forest Service boat launching facilities on the Allegheny River and Allegheny Reservoir.
3. Maintain recreational boating facilities and opportunity for associated activities on the Allegheny River and Allegheny Reservoir.

4. Broaden the scope of the analysis to include alternatives that emphasize/prioritize T&E species by modifying current even-aged vegetative management practices to uneven-aged management or zero cut.

5. Broaden the scope of the analysis to include alternatives that emphasize/prioritize T&E species through the establishment of special protection areas or the designation of seasonal management periods.

6. Broaden the scope of the analysis to include needed Forest Plan changes to address needs of sensitive species.

Table 7 shows how the issues are addressed by each alternative.

Table 7. Issues Addressed by Alternative

Alternative	Issues Addressed	Considered in Detail	Eliminated from Detail Study
1 - Proposed Action	1,2,3	x	
2 - Close Boat Launches	1,2	x	
3 - No Action	3	x	
4 - Zero Cut	4		x
5 - Uneven-age Emphasis	4		x
6 – Special Protection Areas	5		x
7 – Seasonal Management Periods	5		x
8 - Sensitive Species Consideration	6		x

Brief Description of Alternatives

Eight alternatives, including the proposed action, have been developed. Briefly, they are:

Alternative 1 - The Proposed Action: Amends Forest Plan standards and guidelines related to five T&E species. The purpose of these changes is to ensure that the Forest Plan reflects the requirements of the BO and the additional measures outlined in the ANF CP so that Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. Recreational boating opportunities will continue to be provided. Zebra mussel screening and decontamination procedures designed to protect populations of Clubshell mussel and Northern Riffleshell mussel will be implemented. These procedures are outlined in the Zebra Mussel Action Plan in the ANF CP. This plan is subject to periodic modification by agreement with the FWS. Decontamination information will be available for boaters. The monitoring plan will be amended to modify monitoring requirements for Bald eagle and to include monitoring requirements for four additional T&E species.

Alternative 2 - Close Boat Launches: Amends Forest Plan standards and guidelines related to five T&E species to ensure that Forest Plan S&G's reflect the requirements of the BO and the additional measures outlined in the ANF CP so that Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. Forest Service boat launches on the Allegheny River and Allegheny Reservoir will be closed. Eliminating the possibility of Zebra mussel introduction from Forest Service boat launches on the Allegheny River and Allegheny Reservoir will protect T&E mussels. The monitoring plan will be amended to modify monitoring requirements for Bald eagle and to include monitoring requirements for four additional T&E species.

Alternative 3 - No Action: Does not amend the Forest Plan. Existing standards and guidelines and other administrative actions will be relied upon to provide for T&E species' needs. No new standards and guidelines will be adopted. The monitoring plan will remain unchanged.

Alternative 4 - Zero Cut: Amends Forest Plan standards and guidelines related to five T&E species to ensure that Forest Plan S&G's reflect the requirements of the BO and the additional measures outlined in the ANF CP so that Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These

changes ensure that incidental take of T&E species will be minimized. In addition, Forest Plan objectives and outputs will be modified to remove commercial timber harvest activities. The monitoring plan will be amended to modify monitoring requirements for Bald eagle and to include monitoring requirements for four additional T&E species.

Alternative 5 - Uneven-age Emphasis: Amends Forest Plan standards and guidelines related to five T&E species to ensure that Forest Plan S&G's reflect the requirements of the BO and the additional measures outlined in the ANF CP so Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. In addition, Forest Plan objectives and outputs will be modified to replace even-age silvicultural objectives and outputs with uneven-age objectives and outputs. The monitoring plan will be amended to modify monitoring requirements for Bald eagle and to include monitoring requirements for four additional T&E species.

Alternative 6 – Special Protection Areas: Amends Forest Plan standards and guidelines related to five T&E species to ensure that Forest Plan S&G's reflect the requirements of the BO and the additional measures outlined in the ANF CP so Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. In addition, Forest Plan objectives will be modified to include special protection areas for T&E species. The monitoring plan will be amended to modify monitoring requirements for Bald eagle and to include monitoring requirements for four additional T&E species.

Alternative 7 – Seasonal Management Periods: Amends Forest Plan standards and guidelines related to five T&E species to ensure that Forest Plan S&G's reflect the requirements of the BO and the additional measures outlined in the ANF CP so Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. This alternative includes additional S&G's that would impose seasonal restrictions on management activities that result in disturbance to Indiana bat such as logging, tree removal for road and motorized trail construction, and site clearing for special use permits. The monitoring plan will be amended to modify monitoring requirements for Bald eagle and to include monitoring requirements for four additional T&E species.

Alternative 8 – Consideration of Sensitive Species: Amends Forest Plan standards and guidelines related to five T&E species to ensure that Forest Plan S&G's reflect the requirements of the BO and the additional measures outlined in the ANF CP so Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. The monitoring plan will be amended to modify monitoring requirements for Bald eagle and to include monitoring requirements for four additional T&E species.

Alternatives 1, 2 and 3 will be considered in detail. Alternatives 4 through 8 were considered but eliminated from detailed study after careful evaluation determined further analysis of these five alternatives was not needed.

DESCRIPTIONS OF ALTERNATIVES CONSIDERED IN DETAIL

The following is a detailed description of the three alternatives that are considered in detail in this analysis.

Alternative 1 - Proposed Action (The Preferred Alternative)

Alternative 1 amends Forest Plan standards and guidelines related to five T&E species. Three S&G's are revised, twelve S&G's are added, references to Bald eagle are dropped from one existing S&G and one existing S&G is dropped. The monitoring plan will be amended to include monitoring requirements for four additional T&E species. The purpose of these changes is to ensure that Forest Plan S&G's reflect the requirements of the BO and additional measures outlined in the ANF CP so that Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. Recreational boating opportunities will continue to be provided. Management practices outlined in the Zebra Mussel Action Plan (See Appendix A) will be implemented. Populations of

Clubshell mussel and Northern Riffleshell mussel will be protected. Decontamination information will be available for boat users.

Under Alternative 1, all existing Forest Plan standards and guidelines not being modified would remain in effect. Items included in the BO and in the ANF Conservation Program that are consistent with existing Forest Plan direction and implemented through administrative action or under existing program management would be adopted. See Appendix A and B.

Alternative 1 is described in detail in Table 8. New and revised S&G's will become part of the Forest Plan Forest-wide Standards and Guidelines. The monitoring plan will be revised by replacing the monitoring requirements displayed in Table 9 with those displayed in Table 10. The revised pages of the Forest Plan can be found in Appendix G.

Table 8. Additions to Standards and Guidelines in Alternative 1 (The Preferred Alternative)

Bald Eagle

Habitat Protection And Enhancement

1. *The following buffer zones and time of year restrictions shall apply to Bald eagle nests, including those abandoned for ≤ 3 years*:*
    a. *Year-round, all activities that may disturb eagles or significantly alter habitat including, but not limited to, timber harvesting, land clearing, federal oil and gas development, road construction and operation, and trail construction and operation, shall be prohibited within a zone extending at least 660 feet from the nest. This prohibition does not apply to the implementation of measures that are necessary to protect or monitor the nest.*
    b. *From January 15 to July 31 of each year, people and aircraft (under FS control) should not be allowed within 660 feet of the nest. This distance should be increased if topography and/or vegetation permit a direct line-of-sight from the nest to potential activities. This prohibition does not apply to qualified persons conducting necessary eagle research and management.*
    c. *From August 1 to January 14 of each year, hunting, fishing, and other recreational activities are allowable within 660 feet of the nest; however, these activities should be restricted within 330 feet of the nest.*
    d. *From January 15 to July 31 of each year restrict management activities that result in disturbance to nesting birds within approximately 1,320 feet of each active nest location. Examples of management activities that should be restricted include road and trail construction and maintenance, timber cutting and hauling and federal oil and gas development, etc.*

    **Abandoned nests include those nests abandoned for any reason (e.g. movement of adults, fallen nest tree, fallen nest, and damaged nest)*
2. *Three or more super-canopy trees should be identified and maintained within one-quarter mile of each nest as roosting and perching sites. These trees may be large white pines, dead deciduous trees, or trees with dead or broken tops.*
3. *On the side slopes surrounding the Allegheny Reservoir and on the side slopes along the Allegheny River, Tionesta Creek, Clarion River, Kinzua Creek, and Salmon Creek maintain scattered white pines and other trees with potential for use as nesting or roosting trees. Consider not only trees that are super-canopy trees but also trees that may provide nesting or roosting sites in the future, such that a sustainable supply will be available.*

Abandoned Nest Trees

4. *When a nest is classified as a remnant, that is, one that has been unoccupied for five consecutive years, and is not being maintained by eagles, retain only the 330-foot buffer zone. Prohibit disturbances within this buffer zone as stated in #1.*

Roosting Areas

5. *Bald eagle roosting areas shall be identified and protected. Activities that may result in the incidental take of roosting eagles or degradation of roosting habitat shall be restricted within 0.25 mile (1,320 feet) of identified roosting sites.*

Indiana Bat

Habitat Protection and Enhancement

6. *This species was found to occur within the Allegheny National Forest in August 1998. Summer roost and foraging habitat is found in great abundance throughout the ANF. Habitat for this species will be provided through implementation of standards and guidelines. The following standards and guidelines provide specific diameter requirements for live and dead trees that provide habitat for Indiana bat. Trees retained to fulfill snag and den tree requirements (see Forest Plan, p. 4-32) can also be counted towards these requirements.*

7. *For both partial and final harvests in green units (harvested material consists primarily of live, healthy trees) retain all snags. Retain at least 8-15 live trees ≥9 inches d.b.h. per acre in final harvest units, and at least 16 live trees ≥9 inches d.b.h. per acre in partial harvest units.*

8. *For both partial and final harvests in salvage units (dead or dying trees make up 50 percent or more of the harvested volume), and clear-cut, retain at least 5-10 snags ≥9 inches d.b.h. per acre, and of these one snag ≥16 inches d.b.h. per two acres. Also retain at least 16 live trees ≥9 inches d.b.h. per acre, and 3 live trees ≥20 inches d.b.h. per acre in partial harvest units; and retain at least 8-15 live trees ≥9 inches d.b.h. per acre, and 1 live tree ≥20 inches d.b.h. per acre in final harvest units and clear-cut.*

9. *Live residual trees to be retained under #s 7, 8 and 10 shall, where available, be Class 1 or Class 2 trees (as identified by Romme et al., 1995), or other trees exhibiting or likely to develop characteristics preferred by Indiana bats (e.g., exfoliating bark).*

10. *Designate and retain living residual trees in the vicinity of about 1/3 of all large diameter (≥ 12 inches d.b.h.) snags with exfoliating bark to provide them with partial shade in summer.*

11. *For partial/intermediate harvests (e.g., thinnings, shelterwood seed/prep, selection cuts) in healthy stands (stands where volume being removed is predominantly healthy, living trees), reduce canopy closure to >50 percent.*

12. *All known roost trees on the ANF will be protected until such time as they no longer serve as a roost (e.g., loss of exfoliating bark or cavities, blown down, or decay). In the event that it becomes absolutely necessary to remove a known Indiana bat roost tree, such a removal will be conducted through consultation with FWS, during the time period when the bats are likely to be in hibernation (November 15 through March 31). Trees identified as immediate threats to public safety may, however, be removed at any time following consultation with the FWS.*

Protection of Individuals

13. *Demolition or removal of buildings or other man-made structures that harbor bats should occur while bats are hibernating. If public safety is threatened and the building must be removed while bats are present, a bat expert should examine the building to determine if Indiana bats are present.*

Clubshell Mussel And Northern Riffleshell Mussel

Protection Of Individuals

14. At the marina and boat launches on the Allegheny Reservoir, boats shall be screened for potential Zebra mussel contamination, and boats found through screening to be at risk shall be decontaminated using a FWS-approved decontamination method. These same procedures shall apply to commercial use of the boat launch at the Buckaloons Recreation Area on the Allegheny River. Screening and decontamination procedures are conducted in accordance with the Zebra mussel action plan (ANF CP), which is approved by the FWS and updated by agreement as needed.

Protection of Habitat

Concerning perennial and intermittent streams:

15. *A filter strip will be maintained to minimize the movement of silt, humus, and other organic matter into the stream. The standard width is 50 feet plus 4 feet for every one degree of slope adjacent to each side of the stream or the actual size of the riparian area, whichever is larger.*

Forest Plan Page #	Deletions to Standards and Guidelines
4-38	Remove Bald eagle from species listed in 10.
4-39	13. Field surveys will be conducted to determine the presence of small-whorled pogonia populations when road construction, logging, herbicide treatment, trail construction, recreation site development, and oil and gas development are proposed for areas containing suitable habitats for this species.

Table 9. Deletions to Forest Plan Monitoring Plan (Forest Plan Appendix B, p. B-3)

Source and Purpose of Monitoring Action	Activity Effect Practice Output	Unit of Measure	Frequency of Measure	Techniques and/or Data Sources	Expected Precision	Expected Reliability	Responsibility
36 CFR 219.19							
Monitor threatened and endangered species to protect, maintain, or enhance key habitat	Bald Eagle	Population trend	Annual	Field surveys	Moderate	Moderate	Allegheny National Forest

Table 10. Additions to Forest Plan Monitoring Plan

Source and Purpose of Monitoring Action	Activity Effect Practice Output	Unit of Measure	Frequency of Measure	Techniques and/or Data Sources	Expected Precision	Expected Reliability	Responsibility
36 CFR 219.19							
Monitor threatened and endangered species to protect, maintain, or enhance key habitat	Bald Eagle	Nesting success, Nest productivity, Roost sites	Annual	Field surveys	Moderate	Moderate	Allegheny National Forest
	Indiana bat	Use of hibernation, Foraging, roost, maternity, and pre-hibernation habitat	Annual	Field surveys	Moderate	Moderate	Allegheny National Forest
	Clubshell mussel	Potential impacts to habitat quality	Annual	Water Quality monitoring	Moderate	Moderate	Allegheny National Forest
	Northern Riffleshell mussel	Potential impacts to habitat quality	Annual	Water Quality monitoring	Moderate	Moderate	Allegheny National Forest
	Small whorled pogonia	Identify high potential habitat, and survey for the occurrence of plants	Annual	GIS and focused field surveys	Moderate	Moderate	Allegheny National Forest

Alternative 2 - Close Boat Launches

Alternative 2 amends Forest Plan standards and guidelines related to five T&E species. Three S&G's are revised, twelve S&G's are added, references to Bald eagle are dropped from one existing S&G and one existing S&G is dropped. The monitoring plan will be amended to include monitoring requirements for four additional T&E species. The purpose of these changes is to ensure that the Forest Plan S&G's reflect the requirements of the BO and the additional measures outlined in the ANF CP so Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. Forest Service boat launches on the Allegheny River and Allegheny Reservoir are closed. T&E mussels are protected from Zebra mussels introduced from Forest Service boat launches on the Allegheny River and Allegheny Reservoir.

Under Alternative 2, all existing Forest Plan standards and guidelines not being modified would remain in effect. Items included in the BO and in the ANF CP that are consistent with existing Forest Plan direction and implemented through administrative action or under existing program management would be adopted.

Alternative 2 is identical to Alternative 1 (Table 8 and Table 10) with the exception of the proposed standard and guideline #14 pertaining to the Protection of Individuals for Clubshell mussel and Northern Riffleshell mussel. It has been changed to the following for Alternative 2:

Table 11. Addition to Standard and Guidelines in Alternative 2

Clubshell Mussel And Northern Riffleshell Mussel
14. Protection Of Individuals *Avoid the possibility of Zebra mussel introduction at Forest Service boat launches by permanently closing all Forest Service developed boat launch facilities located on the Allegheny River, Allegheny Reservoir, and Allegheny River tributaries. No boat screening or boat decontamination will be necessary.*

Alternative 3 - No Action

Alternative 3 would not amend the Forest Plan to reflect needed changes in S&G's (Table 8) according to the requirements of the BO and the additional measures outlined in the ANF CP. Existing standards and guidelines would remain in effect (Table 5). No changes to the monitoring plan are made in this alternative; the Monitoring Plan remains in effect (Table 9).

Consideration of the No Action alternative is a requirement of NEPA. Alternative 3 is not responsive to the requirements of ESA and NFMA; it provides the basis for comparison between the current Forest Plan direction and changes that are proposed under Alternatives 1 and 2.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

During this analysis, five alternatives were considered but eliminated from detailed study by the ID Team. Two were considered in the DEIS and three were added based on the comments received and issues raised during the 45 day comment period.

Alternative 4 - Zero Cut

Emphasize zero-cut philosophy (the elimination of commercial timber harvesting) rather than even-age management as called for in the Forest Plan - This alternative was considered but eliminated from detailed study for the following reasons:

National Forests are required to develop and maintain Forest Plans that outline the broad management objectives that are to be implemented (after site-specific project consideration has been made). The analysis for the Forest Plan considered a broad range of alternatives, one of which considered a major reduction in harvest levels from what was practiced pre-Forest Plan (Alternative A in the Forest Plan EIS). The Forest Plan analysis took a detailed look at local, site –specific trade-offs between even-aged management and reduced harvest levels. The following points are pertinent:

- A wide range of harvest levels was considered in the Forest Plan FEIS. Alternative C produced an average of 102.6 MMBF per year whereas Alternative A produced 49.9 MMBF per year.
- The environmental consequences of practicing different levels of timber harvest are discussed in the Forest Plan FEIS, Chapter 4.
- The Forest Plan FEIS considers the inter-relationships between the various resource outputs for each alternative.
- The Regional Forester considered numerous trade-offs between the effects of various levels of timber harvest when selecting the Forest Plan preferred alternative (Alternative D in the Forest Plan EIS).
- He also recognized that controversy on this matter would continue, but the alternatives considered adequately represent the views of one side versus the other.
- With all of these things in mind, he selected Alternative D as the preferred alternative because it provided the best mix of goods, services and uses to the public (maximizes net public benefit per 36 CFR Part 219.1)

The request for formal consultation was based on the potential effects of implementing activities outlined in the current Forest Plan. The FWS BO indicates that T&E species are not likely to be jeopardized by continued implementation of the Forest Plan (BO, pp. 61, and 70-78). The "no jeopardy" opinion does not suggest the need to expand this Forest Plan amendment to analyze the differences in impact of implementing the Forest Plan vs. a zero-cut alternative. The BO states that continued implementation of the existing Forest Plan (when modified to include one of the reasonable and prudent alternatives) results in level of take that is not likely to result in jeopardy to the Bald eagle, Indiana bat, Clubshell mussel or Northern Riffleshell mussel, or destruction or adverse modification of critical habitat.

We have reviewed the BO and have determined that the requirements to minimize incidental take or implement a reasonable or prudent alternative do not indicate that a change in overall management direction is warranted. A more lengthy analysis of the Forest Plan and consideration of other management prescriptions would have been indicated had the BO presented jeopardy findings or terms and conditions that could not be resolved within the current management direction. This could have resulted in an analysis of broader scope that would have caused a revision to the Forest Plan.

Consideration of a zero-cut alternative is more appropriately addressed in an analysis of broader consideration than the stated purpose and need for this EIS. The ANF is scheduled to complete an analysis for the revision of the current Forest Plan within the next 2 –3 years. This issue may be addressed at that time.

Alternative 5 - Uneven-age Emphasis

Emphasize uneven-age management rather than even-age management in silvicultural treatments - This alternative was considered but eliminated from detailed study for the following reasons:

Substantial detailed analysis of the potential use of uneven-aged management on the ANF occurred as part of the development of the Forest Plan. The Forest Plan analysis took a detailed look at local, site-specific tradeoffs between even-aged and uneven-aged management. A summary of this analysis is documented in Appendix E of this EIS. The following discussion provides pertinent highlights.

- A wide range of UEAM alternatives were considered in the Forest Plan FEIS. Alternative D, the Forest Plan, included 6,000 acres, whereas Alternative E included 175,000 acres (Appendix E, p. 2).
- The environmental consequences of practicing much more uneven-aged management (Alternative E in the Forest Plan EIS) than even-aged management (Alternative D) are discussed in the Forest Plan FEIS, Chapter 4, pp. 4-17 to 4-30. Environmental consequences and cumulative effects are unique for each (Appendix E, pp. 2 and 3).
- The Regional Forester considered numerous tradeoffs between the effects of even-aged management versus uneven-aged management when selecting the Forest Plan preferred alternative (Alternative D). Those tradeoffs include effects on dispersed recreation, timber harvest volumes and values, and effects on wildlife habitat (Appendix E, pp. 3-5).
- He also recognized that controversy on this matter would continue, but the alternatives considered adequately represent the views of one side versus the other (Appendix E, pp. 5).
- With all of these things in mind, he selected Alternative D as the preferred alternative because it provided the best mix of goods, services and uses to the public (maximizes net public benefit per 36 CFR Part 219.1) (Appendix E, p. 5).
- This decision included designating management areas on the ground; areas where the primary silvicultural method (even-aged versus uneven-aged) plays a primary role in providing an optimal response to the competing needs identified in the planning problems (Appendix E, pp. 5 and 6).

The request for formal consultation was based on the potential effects of implementing activities outlined in the current Forest Plan. Subsequently the BO acknowledged that the current Forest Plan "focuses on even-age silvicultural management practices" and "uneven-aged silvicultural management practices are occasionally used on the ANF" (BO, p. 7). The FWS BO indicates that T&E species are not likely to be jeopardized by implementation of the Forest Plan (BO, pp. 61, and 70-78). The BO states that continued implementation of the existing Forest Plan (when modified to include one of the reasonable and prudent alternatives) results in level of take that is not likely to result in jeopardy to the Bald eagle, Indiana bat, Clubshell mussel or Northern Riffleshell mussel, or destruction or adverse modification of critical habitat.

A more lengthy analysis of the Forest Plan and consideration of other management prescriptions would have been indicated had the BO presented jeopardy findings or terms and conditions that could not be resolved within the current management direction. This could have resulted in an analysis of broader scope that would have caused a revision to the Forest Plan.

Consideration of an uneven-aged alternative is more appropriately addressed in analysis of broader consideration than what is described in the stated purpose and need for this EIS. The ANF is scheduled to complete an analysis for the revision of the current Forest Plan within the next 2 –3 years. This issue may be addressed at that time.

Alternative 6 – Special Protection Areas

Designate areas that provide special protection requirements for T&E species – This alternative was considered but eliminated from detailed study for the following reasons:

National Forests are required to develop and maintain Forest Plans that outline the broad management objectives that are to be implemented (after site-specific project consideration has been made). The analysis for the Forest Plan considered the allocation of lands to the various management areas. Specific goals and objectives are associated with each management area. There are also requirements that initiate the need for an amendment or revision to Forest Plans. As new information is received, or as changes in management direction occur, an amendment may result.

The most current scientific information and approved (or draft) recovery plans were available to ANF and FWS biologists in the development of the T&E BA (12/98), the BO and this analysis. These documents do not suggest the need for establishing special protection areas for these species. The BO acknowledges that:

> "No critical habitat has been designated for the bald eagle, Clubshell or Northern Riffleshell; therefore none will be affected. Critical habitat for the Indiana bat has been designated at hibernacula in Illinois, Indiana, Kentucky, Missouri, Tennessee and West Virginia; however this action does not affect these areas, and no destruction or adverse modification of critical habitat is anticipated (USDI-FWS 1999b, p. 61)."

The recovery plans for species considered here to do not suggest that special protection areas be established as part of the recovery for these species.

The FWS BO indicates that T&E species are not likely to be jeopardized by continued implementation of the Forest Plan (BO, pp. 61, and 70-78). The "no jeopardy" opinion does not suggest the need to expand this Forest Plan amendment to analyze the differences in impact of implementing the Forest Plan vs. a special protection area alternative. The BO states that continued implementation of the existing Forest Plan (when modified to include one of the reasonable and prudent alternatives) results in level of take that is not likely to result in jeopardy to the Bald eagle, Indiana bat, Clubshell mussel or Northern Riffleshell mussel, or destruction or adverse modification of critical habitat.

We have reviewed the BO and have determined that the requirements to minimize incidental take or implement a reasonable or prudent alternative do not indicate that special management zones are needed. If new information on T&E species is gained that indicates that special management zones are needed, then this alternative could be considered in a future analysis.

Alternative 7 – Seasonal Management Periods:

Establish seasonal operating requirements for activities such as logging, road and motorized trail construction, and site clearing for special use permits – This alternative was considered but eliminated from detailed study for the following reasons:

National Forests are required to develop and maintain Forest Plans that outline the broad management objectives that are to be implemented (after site-specific project consideration has been made). The analysis for the Forest Plan considered the multiple use goals and objectives that could be provided from the ANF. The preferred alternative (the current Forest Plan) provided the maximum public benefit for reasons outlined in the Record of Decision for that document.

Implementation of Alternative 7 would result in major impacts to achieving Forest Plan goals and objectives for timber harvest and recreation. Timber harvest activities would be concentrated in a four month time period. Operating seasons with such short duration would be impractical; therefore, harvest levels would decrease. In addition, increased logging activity during the winter months would have an adverse impact to winter recreation opportunities. Intensified winter harvest activity could have adverse impacts on wildlife populations that are stressed by seasonal conditions.

The FWS BO indicates that T&E species are not likely to be jeopardized by continued implementation of the Forest Plan (BO, pp. 61, and 70-78). The "no jeopardy" opinion does not suggest the need to expand this Forest Plan amendment to analyze the differences in impact of implementing the Forest Plan vs. a one that imposes seasonal restrictions. The BO states that continued implementation of the existing Forest Plan (when modified to include one of the reasonable and prudent alternatives) results in level of take that is not likely to result in jeopardy to the Bald eagle, Indiana bat, Clubshell mussel or Northern Riffleshell mussel, or destruction or adverse modification of critical habitat.

We have reviewed the BO and have determined that the requirements to minimize incidental take or implement a reasonable or prudent alternative do not indicate that a change in seasonal activity is

warranted. A more lengthy analysis of the Forest Plan and consideration of other management prescriptions would have been needed had the BO presented jeopardy findings or terms and conditions that could not be resolved within the current management direction. This could have resulted in an analysis of broader scope that would have caused a revision to the Forest Plan.

This alternative is beyond the scope of the purpose and need stated for this project as it impacts goals and objectives related to broader planning issues. Analysis of this kind of issue is more appropriately addressed in an analysis of larger scope such as forest plan revision, which is scheduled for 2002/2003.

Alternative 8 – Sensitive Species Consideration

Amend the Forest Plan to include S&G's that respond to needs associated with sensitive species.- This alternative was considered by eliminated from detailed study for the following reasons:

The sensitive species list for the ANF was revised in February 2000. There are now 26 species on the list for the ANF. Forest Service personnel are currently working on developing Conservation Assessments and Strategies for some of the species on the list. Completion of the first assessment is anticipated to occur sometime next year. If conservation actions included in the plan prompt the need for additional S&G's, an amendment to the Forest Plan will be considered at that time.

Potential impacts to sensitive species as a result of the actions considered in this analysis are documented in the Amendment BA (Appendix D) and are discussed in Chapter 4.

This alternative is not ripe for decision at this time. Future analysis to address this alternative could occur if conservation plans identify needed changes or additions to the Forest Plan.

COMPARISON OF ALTERNATIVES CONSIDERED IN DETAIL

Alternatives 1 and 2 propose similar changes to standards and guidelines, with one exception. In both cases, the changes ensure that Forest Plan S&G's reflect the requirements of the BO and additional measures outlined in the ANF CP so that Sections 7(a)(1) and (2) requirements of the Endangered Species Act are met. These changes ensure that incidental take of T&E species will be minimized. These changes also eliminate the risk of jeopardy to the Northern Riffleshell. There are major differences in the way that jeopardy to Northern Riffleshell is reduced between Alternatives 1 and 2, however.

- Alternative 1 reduces the potential for introduction of Zebra mussel into the Allegheny River and Allegheny Reservoir at Forest Service boat launches through the implementation of the Zebra mussel Action Plan. Forest Service boat launch facilities on the Allegheny Reservoir and Allegheny River continue to be operated.
- Alternative 2 removes the potential for introduction of Zebra mussel into the Allegheny River and Allegheny Reservoir at Forest Service boat launches. The current level of recreation opportunity is reduced by closing boat launches on the Allegheny Reservoir and Allegheny River.

Alternative 3 is the No Action Alternative; there are no changes to standards and guidelines proposed and, as a result, the Sections 7(a)(1) and (2) requirements of the Endangered Species Act are not met. Alternative 3 maintains the current level of recreation opportunity by continuing to offer boat launch facilities on the Allegheny Reservoir and Allegheny River. The Zebra mussel Action Plan is not implemented in this alternative.

The six issues identified for this analysis will be used as a basis for the comparison of the Alternatives. Table 12 shows how each alternative responds to the issues.

Table 12. Comparison of Issues by Alternative

Issues	Alt. 1	Alt. 2	Alt. 3
1 - Minimize Take of T&E Species	Y	Y	N
2 - Reduce Risk of Jeopardy to Northern Riffleshell mussel	Y	Y	N
3 - Maintain Recreational Boating Opportunities	Y	N	Y
4 - Broaden the Scope – Zero cut and Uneven-age Mgt	N	N	N
5 – Broaden the Scope – Special Protection and Seasonal Mgt	N	N	N
6 – Broaden the Scope – Sensitive Species	N	N	N

Alternative 1 responds to issues #1, 2 and 3. Alternative 1 minimizes take of T&E species by amending Forest Plan S&G's in accordance with direction provided in the BO. Risk of jeopardy to Northern Riffleshell mussel is reduced by implementing the Zebra mussel action plan. Recreational boating opportunities continue to be provided at Forest Service facilities on the Allegheny Reservoir and Allegheny River. Alternative 1 does not increase the scope of analysis over what is outlined in the purpose and need for this EIS.

Alternative 2 responds to issues #1 and 2. Alternative 2 minimizes take of T&E species in the same way as described for Alternative 1. Risk of jeopardy to Northern Riffleshell mussel is eliminated from Forest Service boat launches on the Allegheny Reservoir and Allegheny River by the closure of these facilities. Forest Service recreational boating opportunities would no longer be offered in this alternative. Alternative 2 does not increase the scope of analysis over what is outlined in the purpose and need for this EIS.

In Alternative 3, the take of T&E species is not minimized, because all the terms and conditions specified in the BO are not made a part of the Forest Plan. Some protection of T&E species is provided through implementation of existing S&G's. The continued existence of Bald eagle, Indiana bat, and Clubshell mussel is not jeopardized by implementation of the Forest Plan. There is no change in the risk of jeopardy to the Northern Riffleshell mussel from Forest Service facilities as no change in procedures would occur at Forest Service boat launches on the Allegheny Reservoir or Allegheny River. Recreational boating opportunities continue to be provided at Forest Service facilities on the Allegheny Reservoir and Allegheny River. Alternative 3 does not increase the scope of analysis over what is outlined in the purpose and need for this EIS.

CHAPTER 3 - AFFECTED ENVIRONMENT

INTRODUCTION

The discussion pertaining to the affected environment will include the entire ANF. The exception to this will be discussions related to the potential impact of erosion and sediment on the Clubshell mussel and Northern Riffleshell mussel. In this case, the portions of the ANF that drain into the Allegheny River or its tributaries that is not impounded by the Kinzua Dam, Tionesta Dam or Piney Dam will be referred to as the "13 percent subsection." Information presented here will serve as a source of base-line information for the comparison of effects by alternatives and will allow for discussion of issues that are applicable to the entire ANF for Bald eagle and Indiana bat and issues that pertain to the 13 percent subsection of the ANF for Clubshell mussel and Northern Riffleshell mussel. A brief discussion for major resources will be provided, however, detailed discussion will be presented only for those resource areas where a discussion of effects by alternatives is needed to respond to issues or to evaluate effects.

PHYSICAL CHARACTERISTICS

Forest Location

The ANF is located in Northwestern Pennsylvania in Elk, Forest, McKean, and Warren Counties and has 513,127 acres, including water area (See next page for vicinity map). Approximately 13 percent of the ANF (65,271 acres) is found within watersheds that are not impounded, that drain into the Allegheny River.

The National Forest is located within a day's drive of: Cleveland, OH; Pittsburgh and Philadelphia, PA; Washington, DC; and New York, NY. Principal access routes are Interstate 79 from the south and Interstates 80 and 90 and U.S. Route 6 from the north, east and west.

The four-county area that includes the Allegheny National Forest is rural, with forested land averaging about 95 percent. Farmlands and small towns are at scattered locations. Table 13 displays the land area, population, and population density for the four counties.

Table 13. Land Area and Population of the Four Counties in 1990

County	Population	Area (Sq. Miles)	Density (#/Sq. Mi.)
Elk	34,878	830	42.0
Forest	4,802	428	11.2
McKean	47,131	979	48.1
Warren	45,050	885	50.9

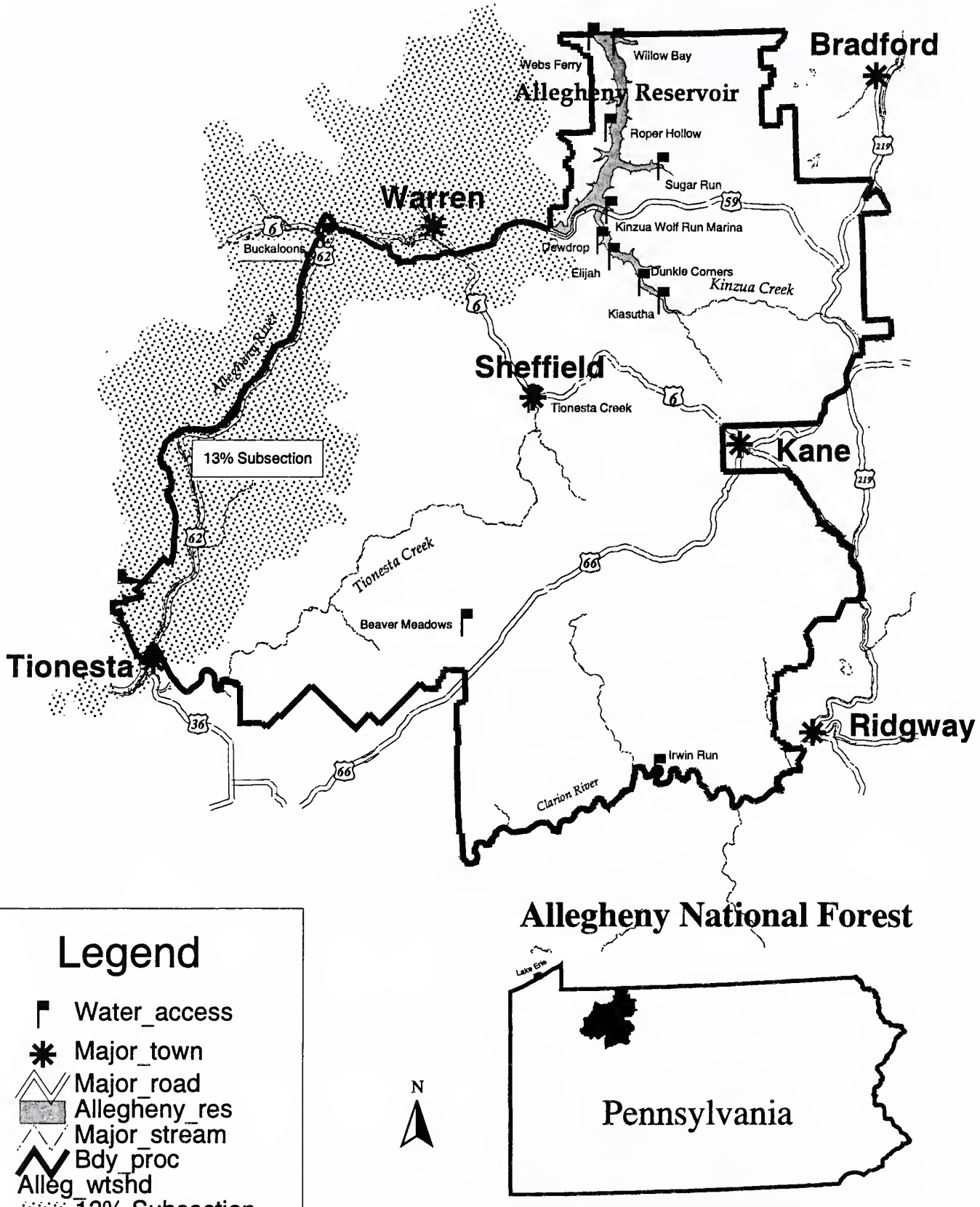
Source: Pennsylvania Recreation Plan 1991-1997. PA Department of Environmental Resources, Bureau of State Parks.

Climate

The climate on the Allegheny National Forest may be termed as continental, or cool humid, and is influenced by three major air masses. The continental or polar air masses that form in northern Canada are mainly responsible for the occasional severe winter weather. Maritime tropical air masses moving northward from the Gulf of Mexico account for most of the precipitation, and other air masses moving eastward from the Rocky Mountains bring mild, dry weather to the area.

Due to the proximity of Lake Erie, skies are frequently cloudy or overcast. The average annual precipitation varies from about 41 inches on the southern portion of the ANF to about 46 inches on the northern portion, with the bulk occurring between April and November. Average seasonal temperatures range from lows of 0-20° F in the winter to highs in the 70-80°F range in the summer.

Map 1 - ANF Vicinity Map



Topography

The ANF is located in the Northern Unglaciated Allegheny Plateau (McNab and Avers, 1994). Over geologic time, the Allegheny River and its many tributaries have cut deep, V-shaped valleys into the plateau. As a result, the plateau is deeply and widely dissected by creeks and streams. Elevations range from 1,000 to 2,300 feet.

Deep, steep-sided valleys divide the relatively flat ridge tops, and changes in elevation of 400 to 600 feet in one-half mile or less are common. The flat to gently-rolling plateau forms the highest part of the ANF and occupies about 38 percent of the area. Flat valley floors and occasionally higher terraces are found along major streams. About 60 percent of the ANF is slopes. Subsections are divided into Landtype Associations (LTA's) (hundreds to thousands of acres). These, in turn, are divided further into Ecological Land Types (ELT's) that range from tens to hundreds of acres. LTA's and ELT's are currently being developed for the ANF.

Roads

There are 1,139 miles of Forest Service-managed roads on the ANF. These roads are managed as either open full-time (38%), seasonally open (25%), or closed (37%). In addition to ANF roads, there are 758 miles of state and township roads, 620 miles of roads that are not managed by the ANF that support private oil, gas, and mineral (OGM) developments, 67 miles of jointly managed roads (by the ANF and OGM companies) and 30 miles of roads managed under special use permit by private parties other than OGM-related developments.

There are 92.8 miles of ANF managed roads found within the 13 percent subsection. Of these, there are 28.9 miles found within 300 feet of streams. These roads have the potential to produce sediment to a stream due to their close proximity; however, this potential is greatly reduced when roads are maintained in a condition that meets minimum Forest Plan standards. There are 18 stream crossings associated with these roads. Currently, there are 23.4 miles of road that are maintained to a standard that meets or exceeds Forest Plan standards. There are 5.5 miles of road that are in a condition that falls below Forest Plan standards. Of these 5.5 miles, 4 miles are scheduled for reconstruction in the year 2000 that will correct deficiencies. The remaining 1.5 miles of road will be scheduled for reconstruction as funds become available.

Powerline Rights-of-Way

Numerous electric utility rights-of-way cross the Allegheny National Forest. Utility companies and/or their contractors complete substantial operation and maintenance activity each year. For example, vegetation must be controlled that has the potential to interfere with the safe and effective operation of these facilities. There are a total of 955 acres of rights-of-way associated with 125 miles of electric utility lines and associated facilities, plus 305 acres of rights-of-way and associated facilities operated by Rural Electric Cooperatives.

The ANF Environmental Impact Statement for Vegetation Management on Electric Utility Rights-of-way (USDA-FS, 1997a) amended the Forest Plan (USDA-FS, 1986) to establish programmatic direction for powerline right-of-way management on the ANF, and it prescribed specific treatments to use on many of these rights-of-way. Vegetation management was completed on a number of sites during the summers of 1998 and 1999. Treatment activities include using carefully selected herbicides or mechanical cutting to control tall-growing trees that have the potential to interfere with safe and reliable transmission of electric power. Much of the vegetation treated consists of small trees growing within the rights-of-way, but sometimes large trees or dead trees on the edge of the right-of-way must be cut when they threaten to interrupt electric transmission service to customers. Standards and guidelines and monitoring requirements exist to help ensure acceptable environmental effects.

Water Quality

The ANF is located in a region of abundant water, with annual precipitation of about 42 inches and runoff of 21 inches. The available water supply exceeds domestic, commercial, and industrial needs currently and into the foreseeable future. Water supply and water quality are adequate for Bald eagle, Indiana bat, Clubshell mussel and Northern Riffleshell mussel.

The ANF is dissected by hundreds of miles of perennial and intermittent streams. These streams flow through a variety of landscapes, as well as through public and private properties within the proclamation boundary of the ANF. The vast majority of streams are smaller, cold-water, headwater streams that are spring-fed. These streams provide cold, clean water to the larger stream systems such as the Allegheny and Clarion Rivers. Overall, water quality of streams in the ANF is good, meeting State standards.

There are a number of impoundments located on the ANF, ranging in size from 1 acre to 7,783 acres. The three largest reservoirs include the 12,080-acre Allegheny Reservoir (7,783 acres of which are within the ANF proclamation boundary), Tionesta Reservoir at 480 acres, and Ridgway Reservoir at 75 acres. The Allegheny Reservoir and Tionesta Reservoir are flood control reservoirs operated by the U.S. Army Corps of Engineers. The Ridgway Reservoir is the municipal water supply for the town of Ridgway. The remaining impoundments are smaller in size and are mostly shallow bodies of water that were originally built for waterfowl management by the Commonwealth of Pennsylvania. Overall water quality in the Allegheny, Tionesta and Ridgway Reservoirs is good because of their depth. The smaller impoundments tend to be more acidic because of the shallow depths and a higher ratio of water in contact with acidic soils.

Within the 13 percent subsection of the ANF that flows directly into the Allegheny River, there are approximately 161 miles of cold, headwater streams. These streams range in size from small first order streams to the larger East Hickory Creek drainage. The East Hickory Creek drainage is the dominant watershed that flows into this section of the Allegheny River from ANF lands and includes the 8,630 acre Hickory Creek Wilderness Area. Numerous biological and water chemistry surveys have been conducted on no less than 21 named perennial streams flowing into the section of the Allegheny River that is not impounded. In addition, one intensive fish habitat survey has been conducted. The surveys were conducted by numerous agencies and entities, including Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection (PA DEP), FWS, ANF, Environmental Protection Agency (EPA), U.S. Geological Service (USGS) and the Western Pennsylvania Conservancy. Many of the surveys were initiated in the early 1980's as a result of the large oil and gas development that was occurring at the time across the entire ANF, and others have been routine surveys assessing the current status of a particular stream.

The most current data on the surveyed streams was collected between 1974 and 1999. Based on a review of this data, all the streams have good water quality and meet State water quality standards. Each of the streams is cold-water and supports various fish species that inhabit cold-water environments. Because of the streams' locations on the landscape (unglaciated), they can be characterized as infertile mountain streams with little buffering capacity.

Portions of the Allegheny River were added to the federal Wild and Scenic River system in 1993. The Pennsylvania Department of Environmental Protection has classified the Allegheny River as a warm-water fishery in its Chapter 93 Water Quality standards (PA DEP, 1994). Two water quality network stations on the river within the ANF are operated by PA DEP to monitor water quality conditions. The stations, #WQN0866, located at the Glade Bridge (State Route 6) in Warren, and #WQN0805, located at the West Hickory and State Route 127 bridge, are surveyed four times a year. Station #WQN0805 has been surveyed since 1962 and #WQN0866 since 1988. A variety of 20 parameters are measured.

Overall water quality in this section of river can be characterized as very good based on the grab samples taken at each of the stations. Some examples include pH that is good at both stations, with readings predominantly in the mid 6.0 to mid 7.0 range. Total alkalinity (as calcium carbonate) predominantly ranges

from the 10's to 60's mg/l. Visual observations indicate a dominance of cobble and gravel substrate at both stations.

Water quality conditions required for the colonization of the Zebra mussel have been developed, but are continually being updated as more information is collected on their life histories within the United States (Doug Jensen, pers. comm.). Table 14 displays the current criteria, along with existing conditions in the Allegheny River, and the potential levels of Zebra mussel populations should they become established. The existing data covers various time frames from the two different water quality stations mentioned on the previous page. The water velocity was taken from USGS stream flow data.

Table 14. Water Quality Standards and Conditions for Zebra Mussel in the Allegheny River

Criteria	Zebra Mussel Requirement	Existing Condition in Allegheny River	Potential Zebra Mussel Colonization Levels
pH (standard units)	7.5-9.0: moderate-high colonization. 6.5-7.2: low colonization.	7.1 at WQN0805 6.95 at WQN0866	low
Dissolved calcium (mg/l)	15-20: moderate to high colonization.	15.3	moderate to high
Dissolved oxygen (ppm)	6-10: moderate to high colonization. 4-6: low colonization.	well within the 6-10 range, often exceeding 10.	moderate to high
Water velocity (m/s)	0.1-1.25: moderate to high colonization. >1.5: no colonization, current too fast.	high % well within the 0.1-1.25 velocity range.	moderate to high
Water temperature (C)	16-25 average summer: moderate to high colonization.	high % well within the temperature range	moderate to high

Oil, Gas and Minerals (OGM)

The ANF lies in the heart of the oil and gas-producing region of northwest Pennsylvania. Currently there are approximately 6,000 active, producing wells on the ANF. Approximately 93 percent of the subsurface mineral rights are privately owned (either outstanding or reserved rights). The development of these mineral interests occurs with no Federal decisions being made.

There are approximately 35,000 acres of Federally- owned minerals. Of these, there are less than 1,500 acres under active lease, 15,255 acres available for lease, and 13,960 acres withdrawn from mineral development. No new development of Federally-owned minerals is anticipated prior to Forest Plan revision.

Oil field development typically results in wells that are closely spaced, usually 400-500 feet apart, with associated access roads, production and storage facilities, and pipelines. Older pipelines can be found on the surface, but current practice is to bury pipelines. There are existing S&G's that apply to the development of Federal OGM interests (Forest Plan, p. 4-42). There are also existing S&G's that apply to actions that are negotiated with mineral operators in the development of private OGM interests (Forest Plan, pp. 4-42 through 4-47).

Air Quality

Air quality on the ANF is generally good. The 1977 Clean Air Act Amendments established ambient air increments for particulate matter and sulfur dioxide in Class I and Class II air quality attainment areas. Most of the ANF is Class II.

Air pollution on the ANF is being monitored at the Kane Experimental Forest as part of the National Atmospheric Deposition Program/National Trends Network. Parameters such as pH, sulfate, nitrate, and ammonium ions are measured. The median pH of the precipitation is 4.09.

Soils

Soils on the ANF were formed in residual, colluvial, and alluvial materials that were derived primarily from shales and sandstones that date back to the Pennsylvanian, Mississippian, and Devonian periods of geologic history. These rock formations are almost entirely of sedimentary origin and very strongly acid, resulting in very acidic soils on the Forest.

Plateau soils are generally well to moderately well drained, with the water table usually deeper than 18 inches below the surface. Soils that are poorly drained, with a water table at or near the surface, may also occur on the plateau. Slopes vary from level to about 25 percent but are usually less than 15 percent.

Soils on the slopes of the river valleys may vary from well drained to poorly drained. Although slopes may be almost vertical, most are less than 40 percent. Rock outcrops and large boulders occur on a scattered basis.

Soils are grouped according to internal soil drainage characteristics. Other important soil factors are: textures and amounts of coarse fragments in the surface (A horizons) and subsoil (B horizons); topographic positions; and percent slope.

Soil Group I are well drained soils and comprise about 45 percent of the ANF. Hazelton, Hartleton, Clymer, Chenango, Pope, and Gilpin are major soils in this group.

Soil Group II are moderately drained soils that comprise about 41 percent of the ANF. Cookport, Ernest, Philo, Braceville, and Wharton are the major soils in this group.

Soil Group III includes Nolo, Cavode, Brinkerton, Albrights, Atkins, Rexford, and Armagh soils. These soils are poorly drained and comprise about 14 percent of the ANF.

There are many S&G's that apply to soil resources designed to minimize the potential for soil erosion (Forest Plan, pp. 4-19 through 4-29). One existing Forest Plan S&G is not consistent with the Best Management Practices (BMP's) outlined by the Commonwealth of Pennsylvania. Other Forest Plan S&G's are consistent with state BMP's.

BIOLOGICAL CHARACTERISTICS

Vegetation

Forest Type and Age Class Distribution

Pennsylvania contains about 17 million acres of forestland, with sawtimber stands comprising 54 percent of these lands (Alerich, 1993a). Forested conditions are found on 95 percent of the ANF's 513,127 acres, 78 percent of which is sawtimber sized and older than 60 years of age. Several distinct forest types are present on the ANF including Allegheny hardwoods (Black cherry, white ash and yellow poplar), northern hardwoods (American beech, sugar maple, yellow birch and hemlock), upland hardwoods (mixture of red maple, Black cherry, black birch, yellow poplar, white ash, basswood and cucumber), and the oak type.

At the broad landscape scale, forest vegetation is composed primarily of Allegheny, upland, and Northern hardwoods, with oaks along the major river valleys, conifers in the stream bottoms and on north slopes, and with a scattering of aspen and openings across the plateau. The combination of these general forest types combined with age class creates diverse vegetative conditions across the landscape (Table 15). (USDA-FS 1998a)

Table 15. Forest Types and Forest Age Classes on the Allegheny National Forest*

Forest Type	Age Class (Years)								
	0-10	11-20	21-50	51-90	91-110	111+	No data	Total	(%)
Hemlock	0	0	55	2,416	4,138	629	80	7,318	(1%)
Other Conifer	111	48	1,178	8,060	1,060	233	20	10,710	(2%)
Oak	1,063	1,079	1,176	20,165	50,442	6,856	539	81,321	(16%)
Allegheny Hardwood	14,362	11,038	13,917	55,708	70,514	503	2,423	168,465	(33%)
Upland Hardwood	2,662	3,835	3,234	52,059	60,351	468	3,768	123,385	(24%)
Northern Hardwood	1,515	1,903	5,584	28,901	49,870	3,250	416	91,439	(18%)
Aspen	437	420	498	1,523	350	0	28	3,256	(<1%)
Open (no age)	22,328	0	0	0	0	0	0	22,328	(4%)
No Data	17	0	26	297	359	0	1,216	1,915	(<1%)
Total (%)	20,270 (4%)	18,322 (4%)	25,789 (5%)	169,148 (33%)	237,223 (46%)	11,939 (2%)	31,433 (6%)	513,127	(100%)

**** Source - CDS database, October 1999***
***** Includes openings and low stocked savannas***

The ANF is part of a larger forested landscape within Pennsylvania. Forest cover is abundant on the ANF for the species discussed in this analysis, with close to 95 percent of the ANF in a forested condition. This far exceeds the HSI model (Romme *et al.,* 1995) thresholds for suitable habitat for Indiana bat (5% forest cover) and optimum habitat (30 % forest cover).

Forest Vegetation and Habitat for Threatened and Endangered Species

Vegetation found on the ANF provides elements of habitat for Bald eagle and Indiana bat. Each species will be discussed in sections below. Vegetation does not provide elements of habitat for Clubshell mussel and Northern Riffleshell mussel. These species will not be discussed.

Bald Eagle

The forest types found on sites where Bald eagles are known to nest and are most likely to nest (side slopes surrounding the Allegheny Reservoir and on the side slopes along the Allegheny River, Tionesta Creek, Clarion River, Kinzua Creek, and Salmon Creek) are primarily Allegheny hardwoods, upland hardwoods, northern hardwoods or oak. Large super-canopy white pines that provide potential nest sites are found as a component within these types on these sites. Field observations within these stream corridors find a well-distributed supply of super-canopy white pine present. The vast majority of the ANF on the side slopes adjoining these rivers and streams has forest cover.

Indiana Bat

Roost Habitat - Size Class Distribution of Live and Dead Trees

The size class distribution and abundance of live and dead trees describes an element of roost habitat for Indiana bat. The HSI model, as adapted for the ANF, is the basis for the measurable threshold values for suitable and for optimal habitats. An assessment of the distribution of live and dead trees was completed for the T&E BA (12/98) (USDA-FS 1998. Appendix E, Attachment 1). The results of that analysis are displayed in Table 16.

Table 16. Characteristics of Indiana Bat Summer Roost Habitat - Live and dead Tree Component

Characteristics of Suitable Habitat	Occurrence (%)	Characteristics of Optimum Habitat	Occurrence (%)
Live Trees		**Live Trees**	
At least 8 - 15 trees per ac ≥ 9" dbh	100	At least 16 trees per ac ≥ 9" dbh	100
At least 1 tree per ac ≥ 20" dbh	75	At least 3 trees per ac ≥ 20" dbh	75
Dead Trees		**Dead Trees**	
At least 3 trees per ac ≥ 9" dbh	38	At least 5 trees per ac ≥ 9" dbh	38
Of these, 1 tree per 10ac ≥ 12" dbh	28	Of these, 1 trees per 2 ac ≥ 20" dbh	4

These results are the estimates of the proportion of an area within large, contiguous blocks of second growth forest that meet the stated criteria. They represent the condition that one might expect to find at a level that includes an aggregate of stands (i.e., areas greater than 75 acres), rather than at an individual stand level. They also represent the condition that one might expect to find only in stand aggregates consisting of second growth forest (i.e., stands 50 years or older). Similar habitat conditions for Indiana bat occurred in the conifer, oak, northern hardwood, Allegheny hardwood, and upland hardwood types. The aspen forest type was not sampled in this survey.

To meet the minimum requirements for suitable habitat, forest cover with distributions of live and dead trees shown above must be found on at least five percent of an area. With 95 percent of the ANF found in a second-growth forested condition and live tree requirements being met 75 percent of the time and dead tree requirements being met 28 percent of the time, it is evident that **suitable** habitat is plentiful.

To meet the minimum requirements for optimal conditions, forest cover with dead and live tree distributions must be found on 30 percent of the area. With 95 percent of the ANF found in a second-growth forested condition and live tree requirements being met 75 percent of the time, and 9" dbh requirements for dead trees met 38 percent of the time, **optimum** habitat (for all criteria other than 20" diameter dead trees) is plentiful. It does not appear that habitat would limit the occurrence of Indiana bat across the ANF.

Roost Habitat - Live Tree Canopy Closure Component

Canopy closure (degree of closure of the overstory canopy that affects the quantity and quality of light that reaches underlying layers of forest vegetation) plays an important role in quantifying the quality of forested condition for roost habitat. Roost habitat definitions outlined in the HSI model have been adapted for local conditions on the ANF (T&E BA 12/98, pp. 20-21). Table 16 displays the current distribution of ANF acres between different roost habitat conditions.

Direct measures of canopy closure are not available from ANF vegetation inventories. An indirect measure that uses relative stand density (a measure of tree crowding based on the amount of growing space required by individual tree species) has been calculated by Dr. David deCalesta of the Northeastern Research Station, Irvine, PA (deCalesta and Ordiway, pers. comm.). The mathematical relationship used to calculate acres of roost habitat as displayed in the T&E BA (12/98) (p. 27) has been revised. Also, some new field data has

been collected since the Table in the T&E BA (12/98) was produced. Table 17 (updated from the T&E BA 12/98) was generated using this revised equation and the most recent survey data available in the ANF's Combined Data System (CDS) database as of July 1999.

Table 17. Present Distribution of Roost Habitat

Habitat Description	Habitat Features Present	Acres or % of ANF
Openings	Overall, less than suitable condition. Scattered trees are present that could be used for roost purposes	16,968 (3%)
Seedling/Sapling Stands	Overall, less than suitable condition. Reserve trees and clumps are present that could be used for roost purposes	57,931 (11%)
Suitable habitat - Open crowns	Forested stands with <54% canopy closure. Forest average dead and live tree distributions apply	24,304 (5%)
Optimal habitat	Forested stands with 54-80% canopy closure. Forest average dead and live tree distributions apply	187,663 (37%)
Suitable habitat - Closed crowns	Forested Stands with >80% Canopy Closure. Could be managed for optimal by completing partial harvest treatment. Forest average dead and live tree distributions apply.	163,472 (32%)
Unclassified	Insufficient data to quantify	62,662 (12%)

Table 17 shows that 37 percent of the ANF is found with the optimal canopy closure range for roost habitat. Stands within the condition range for suitable habitat are found on an additional 37 percent of the ANF. Currently, there is abundant roost habitat for Indiana bat. Roost habitat is not a limiting factor for Indiana bat on the ANF. In most cases, optimal habitat conditions are found where timber harvest (usually thinnings) has occurred in the past. As time passes, these conditions will change as trees grow and canopies become denser.

Foraging Habitat - Canopy Closure Component

Canopy closure plays an important role in quantifying the quality of forested condition for foraging habitat. Foraging habitat definitions outlined in the HSI model have been adapted for local conditions on the ANF (T&E BA 12/98, pp. 20-21). Table 18 displays the current distribution of ANF acres between different foraging habitat conditions.

Table 18. Present Distribution of Foraging Habitat

Habitat Description	Habitat Features Present	Acres or % of ANF
Openings	Overall, less than suitable condition, however surveys on the ANF indicate openings are used for foraging	16,968 (3%)
Seedling/Sapling Stands	Overall, less than suitable condition. Reserve trees and clumps are present that provide minimal habitat requirements	57,931 (11%)
Suitable Habitat - Open Crowns	Forested Stands with < 50% canopy closure. Forest average dead and live tree distributions apply	18,500 (4%)
Optimal Habitat	Forested Stands with 50-70% Canopy Closure Forest average dead and live tree distributions apply	99,448 (19%)
Suitable Habitat - Closed Crowns	Forested stands with > 70% canopy closure. Could be managed for optimal by completing partial harvest treatment. Forest average dead and live tree distributions apply.	257,491 (50%)
Unclassified	Insufficient data to quantify	62,662 (12%)

Based on the same field data used to describe roost habitat in Table 17, Table 18 shows that optimal foraging habitat exists on 19 percent of the ANF and that suitable habitat is found on 54 percent of the ANF. Currently, there is abundant foraging habitat for Indiana bat, and the opportunity to provide additional foraging habitat if desired. Foraging habitat is not a limiting factor for the occurrence of Indiana bat on the ANF.

ANF Harvest Treatments

Silvicultural methods are applied in stands to produce the desired future condition and levels of outputs envisioned by the Forest Plan for a management area (USDA-FS, 1986). Both even-age and uneven-age management systems are considered, with the ultimate selection of a specific treatment based upon the long-term Forest Plan objectives for the management area and the resource conditions that exist within the stand. Timber harvest activities have the potential to change the kind and the quality of habitat found within an individual stand by changing the canopy closure and stand structure. Harvest activities also have the potential to impact the distribution of live and dead trees found within a stand. Existing Forest Plan S&G's require that snag and den trees be retained in all stands scheduled for timber harvest.

Even-age silvicultural techniques are used where long-term objectives are to manage for trees that are relatively close in age (± twenty years). Even-age silvicultural treatments include intermediate thinning, shelterwood harvests, and clearcuts. Stands are managed for an established length of time (rotation age), with the eventual intention to establish a new age class of seedling regeneration to replace the trees currently in place. This type of management can be accomplished by applying a series of commercial and non-commercial treatments throughout the life of the stand, some of which take place during the initial phases of stand development (seedling release, pre-commercial thinnings), some during the mid-life of a stand (intermediate thinnings, timber stand improvements) and some nearing the rotation age for the stand (reforestation treatments to establish seedlings, regeneration harvests such as shelterwoods or clearcuts). For the most part, seedlings are produced through natural regeneration processes. Sometimes, artificial regeneration (planting) is used when seed source is lacking or seedlings fail to develop. Repeating even-age treatments across the landscape results in a multi-age forest composed of even-age stands. Even-age treatments include intermediate thinning, shelterwood harvests, and clearcuts.

Uneven-age silvicultural techniques are used where long term management objectives are to maintain continuous forest cover with a variety of age and size classes present within the same stand. Two types of uneven-age treatments are used - individual tree selection and group selection. Management activities occur periodically (approximately 20 years apart) with each entry intended to establish some seedling regeneration. The objective for selecting an uneven-age treatment may vary, but often it is related to visual, recreational or site (wetness) concerns. The factors considered in the application of an uneven-age harvest are the same as those considered in even-age systems - stand density, stand structure and species composition, however the type of structure and composition are quite different than those sought under even-age treatments.

An assessment of the post-harvest condition of vegetation was completed as part of the T&E BA (12/98) to determine what impact commercial harvest activities have on habitat for Indiana bat (T&E BA 12/98, Appendix E, Attachment 2). Similar distribution of live and dead trees occurred following timber harvest (shelterwood seed cut, selection harvest, intermediate thinning, salvage sanitation and salvage thinning) as is found in the ANF landscape. This data suggests that timber harvest has negligible impact on the landscape condition of habitat for Indiana bat in terms of the distribution of live and dead trees.

Precise measurements for the pre-harvest relative stand density and canopy closure were not available for the stands included in the post harvest analysis. However, there are silvicultural standards used by ANF silviculturists for the selection of the treatments included in this survey. In general practice, intermediate thinnings and selections are applied in stands where pretreatment relative densities are above 80 percent (84% canopy closure). Shelterwood seed cuts are applied above 70 percent relative density (75% canopy closure). By definition, salvage (sanitation or thinning) could occur in stands where the healthy tree relative

density could be as low as 40 percent (48% canopy closure), however on average it is higher than 60 percent (66% canopy closure) (USDA-FS 1995a, Appendix B).

Residual stand density varied somewhat by treatment type, however differences are not significant. Table 19 displays the average relative density following harvests that was reported in the T&E BA (12/98). Canopy closures have been added to this table (using the current, updated conversion formula from deCalesta and Ordiway (deCalesta and Ordiway, pers. comm.). This data suggests that optimal roost and foraging habitat (based on canopy closure) will be found following these kinds of timber harvests. It also suggests that forest canopies can be treated by removing trees to reduce high canopy closures (that provide suitable habitat) to levels that provide optimal roost and foraging habitat.

Table 19. Average Post-Harvest Condition from ANF Sale Areas

Harvest Method	% Relative Density	% Canopy Closure
Shelterwood Seed Cut	56.8	63
Selection (Group and Individual Tree)	56.3	62
Intermediate Thinning	73.0	77
Salvage Sanitation	62.5	68
Salvage Thinning	63.2	69
All Harvest Methods	62.4	68

Adaptive management is a process that allows existing and evolving research findings to be blended with applied management actions. By carefully monitoring preliminary results and being flexible in applying subsequent actions, successful management results can be attained while furthering overall knowledge. Observations completed by research and ANF personnel to date indicate that light conditions on the forest floor (i.e., crown closure or relative density) seem to play a significant role in tree seedling development. An adaptive management approach in the application of two-age, selection and shelterwood harvests that creates more open crown condition is proposed to gain a better understanding of the role of light conditions with respect to seedling development. It is likely that residual crown closures would fall below 50 percent following some of these treatments.

Reforestation

Reforestation techniques are included in both even-age and uneven-age regeneration sequences. The goal of any regeneration harvest is to establish a new age class of seedlings to replace trees being removed. The primary difference between even-age and uneven-age treatments is that in even-age management, the entire stand is regenerated at once, within a relatively short period of time and results in a stand composed of trees of the same age. Uneven-age treatments are intended to produce fewer numbers of seedlings in every entry and result in a stand composed of trees that vary in age, with continual replacement of trees over time. The same reforestation treatments (herbicide application, area fencing, site preparation) can be effective in both even-age and uneven-age systems.

Seedling regeneration is somewhat difficult to establish on the ANF (USDA-FS, 1991; USDA-FS, 1986). Decades of over-browsing by extremely high populations of white-tailed deer have resulted in an impoverished understory and mid-story vegetation layer (Jones *et al.*, 1993). Seedlings, shrubs and smaller trees are generally sparse or absent. Understory vegetation is often dominated by ferns, grasses, beech brush and striped maple (McWilliams *et al.,* 1996; USDA-FS, 1995a). Seedling development of a greater diversity of desirable species can be achieved more effectively by completing reforestation treatments such as removing the competing vegetation (fern, grass, beech and striped maple) with an herbicide, protecting seedlings from browse by fencing, and providing optimal light conditions by removing low shade by felling

stems in combination with a regeneration harvest such as a shelterwood seed cut, or an individual or group selection harvest. Thus, successful stand regeneration can be achieved.

Reforestation success historically has been very good in areas where final harvests have occurred. Tree seedlings are successfully established on 94 percent of the final harvest areas cut between 1976 and 1990 (USDA-FS 1997, pp. 15-17). These are areas where we have followed existing Forest Plan standards and guidelines (Alternative 3 in this EIS).

Herbicides

Two herbicides are approved for use in reforestation treatments on the ANF - glyphosate (Accord®) and sulfometuron methyl (Oust®). These two herbicides are used to control understory vegetation that interferes with the establishment and growth of tree seedlings. Ferns, grasses, striped maple, and beech are the target vegetation. The primary method of application is an air blast sprayer attached to a skidder, although on occasion a backpack sprayer is used. When used as planned, neither of these herbicides are harmful to mammals or insects and neither bioaccumulates in animal tissues (USDA-FS 1991). During the first decade of Forest Plan implementation, 11,240 acres were treated with herbicide. The second decade calls for 1,800 acres of herbicide treatment annually.

Herbicide use also occurs on electric utility rights-of-way (ROW). An environmental impact statement with a wildlife risk assessment, biological assessment and concurrence from the FWS was completed in 1997. This EIS covers 125 miles of rights-of-way totalling 955 acres. Vegetation that interferes with ROW management can be treated manually, mechanically, and/or with fosamine ammonium, glyphosate, imazapyr, metsulfuron methyl, picloram, triclopyr, and mineral oil carriers. When used as planned, none of these herbicides are harmful to mammals. These treatments are carried out by the utility companies, following the mitigation measures outlined in the EIS. Less than 375 acres of treatment occurs each year.

Firewood

Between 600 and 800 personal use firewood permits are sold each year. Cutting of standing dead or down trees is permitted within 150 feet of an open Forest Service road except in wilderness areas, national recreation areas, Buzzard Swamp, scenic areas, Tionesta Research Natural Area, Kane Experimental Forest, developed recreation areas, closed 6.2 Management Areas, and along all paved Forest Service roads. Each permit allows the cutting of up to ten cords of firewood.

Insect Defoliations, Treatments and Impacts

The ANF has experienced a series of major insect outbreaks, both native and exotic, across large areas of the ANF since 1985. As of the end of 1995, native defoliators (elm spanworm, Cherry scallop shell moth, and forest tent caterpillar) and exotic defoliators (gypsy moth and pear thrips) had affected 72 percent of the ANF with one or more defoliations (USDA-FS, 1995b). By the end of 1997, the areas that had experienced at least one defoliation increased to 86 percent of the ANF (USDA-FS 1997). The result of more than a decade of widespread defoliation, in combination with several droughts (1988, 1991 and 1994), a late spring killing frost in 1992, and both unusually snow-free and unusually snowy winters has been both sudden and gradual tree decline and mortality. The impact of these stresses on some tree species (especially sugar maple) appears to vary with site nutrient status (Horsley *et al.,* 1999).

Efforts to protect the forest from stresses associated with defoliation have included aerial spray programs designed to reduce populations and reduce serious defoliation, thus helping to prevent subsequent tree decline and mortality. Two insecticides, Bacillus thuringiensis (B.t.), naturally occurring bacteria, and Dimilin, a chemical insecticide, have been aerially applied (Table 20). Dimilin was used twice in the 1980s to control gypsy moth. Dimilin has since been replaced by B.t., and there are no plans to use it in the future. Based on this, the potential impacts of the use of Dimilin will not be discussed further. Impacts of its use would be analyzed and consultation with the Fish and Wildlife Service would occur should the use of

Dimilin be proposed in the future. Two studies completed on the ANF did not find correlation between insect species richness and diversity and historical intensity, duration, and type of insecticide used (Rawlins *et al.,* 1997, and Rawlins *et al.,* 1998).

Despite efforts to reduce stresses associated with insect outbreaks, large areas of the ANF have experienced noticeable tree decline and mortality. By 1994, mortality associated with spanworm and tent caterpillar defoliation had been observed on approximately 89,400 acres. Inventory data collected on 12,000 of the most severely affected of these acres were analyzed to characterize this decline (McWilliams *et al.,* 1996). Analysis of data showed that 12 percent of the total basal area per acre was in dead trees, and 16 percent was in trees that showed a high risk of mortality.

Table 20. Acres of Bacillus Thuringiensis (B.t.) and Dimilin Treatment on the Allegheny National Forest and Target Insect (Omer, pers. comm.)

Year	Acres treated	Target insect
1985	10,387	gypsy moth
1986	none	
1987	29,748	gypsy moth
1988	6,174	gypsy moth
1989	42,125	gypsy moth
1990-91	none	
1992	23,133	gypsy moth
1993	16,485	gypsy moth
1994	9,366	gypsy moth
1994	55,762	elm spanworm
1995	55,444	forest tent caterpillar
1996-99	none	

Additional outbreaks from any of the forest defoliators experienced to date could re-occur in the future. Examination of records of insect and disease outbreaks on the ANF since 1965 show, for example, that cherry scallop shell occurs on approximately a 10-year cycle, and that gypsy moth is expected to occur on a 5 to 10-year cycle (USDA, 1985; USDA-FS, 1997). The life cycle of species such as elm spanworm are less understood, and it is unknown when or if serious outbreaks of spanworm will re-occur. Tree decline and mortality will continue to occur with future insect outbreaks. (As forested stands age, and the size of trees increases, there is good likelihood that more large diameter dead trees will develop on the landscape.)

Wildlife Habitat

Wildlife habitat will be addressed in three ways. First, wildlife and habitat at the landscape scale will be evaluated using a coarse filter approach. The diversity of successional stages and community types will be described. Second, management indicator species (MIS) will be used to evaluate changes in habitat or trends of species. The MIS represent a wildlife group or guild that would react similarly to changes in habitat. And third, a fine filter approach will be used to assess potential impacts to federally proposed, threatened, or endangered species and regionally sensitive species. This approach takes a close look at the specific habitat needs of species in which adverse impacts and viability are concerns. A more complete discussion of proposed, threatened, or endangered species and regionally sensitive species can be found in the Biological Assessment in Appendix D.

Composition and Structure of Communities

The diversity of wildlife is dependent upon the diversity of available wildlife habitat. These habitats are a combination of successional stages and vegetation types (cover types). The diversity of habitat constantly

changes as forest succession continues and as a variety of forest activities are implemented. The availability of various wildlife habitats is summarized in the ANF annual monitoring reports. The current variety of habitats, forest types, and age classes on the ANF is displayed in Table 20.

The vegetation structure in a forest can greatly influence wildlife use and abundance. A forest with a diverse understory, mid-story and overstory will support a diverse assemblage of wildlife. On the ANF, past and present deer populations have had a major impact on the diversity of vegetation. Diverse understories of hobblebush, maple-leaf viburnum, Canada yew, and other palatable shrubs and wild flowers have been replaced by monocultures of New York and hay-scented fern, striped maple, and beech (Jones *et al.,* 1993). High deer populations have an adverse impact on species richness of intermediate-canopy songbirds (deCalesta, 1994). Studies in progress on the ANF show the importance of these diverse understories to wildlife. About 60 wildlife species utilize herbaceous shrubs, and 40 species prefer a dominant deciduous shrub component (Linda Ordiway, pers. comm.). Half of the ANF has understories where vegetative diversity has been diminished and ferns are dominant (USDA-FS, 1991).

Wildlife species richness is influenced by forest successional stages. Early successional forests (seedling and sapling habitat, 0-19 years old) occur on about seven percent of the ANF. About 30 species utilize seedling/sapling habitat exclusively, while another 150 species utilize a combination of mature and regenerating forest communities for feeding and reproduction (DeGraaf *et al.,* 1992). Mature forests (50-109 years old) occur on about 84 percent of the ANF and are utilized exclusively by about 10 wildlife species while another 160 species utilize a mature forest in combination with other successional stages (DeGraaf *et al.,* 1992). Late-successional/old growth forests occur on about 1.5 percent of the ANF. The number of wildlife species associated with each of these successional stages is presented in Table 21.

Table 21. Wildlife Habitats

	ANIMALS				
COMMUNITY TYPE	**Amphibians**	**Reptiles**	**Birds**	**Mammals**	**Total**
Hardwood Forest Types					
• Seedling (0-10 yrs)	10	9	95	42	**156**
• Sapling (11-20 yrs)	17	11	64	37	**129**
• Pole (21-50 yrs)	17	11	64	37	**129**
• Sawtimber (51+ yrs)	18	12	89	44	**163**
Oak - Sawtimber (51+ yrs)	13	15	77	38	**143**
Aspen					
• Seedling (0-10 yrs)	4	8	80	40	**132**
• Sawtimber (51+ yrs)	6	10	60	42	**118**
Old Growth (111+ yrs)	5	9	26	14	**54**
Mature Mixed Hardwood/Conifer[2]					
Mature Hemlock	12	7	74	37	**130**
Mature White Pine	10	10	76	36	**132**
Non-Forest (openings)					
• Grass/Forb	2	14	69	25	**110**
• Tall Forb/Shrub	1	13	89	29	**111**
Riparian	25	5	33	13	**76**

1 - Habitats are displayed for National Forest System lands. Adapted from DeGraaf et al., 1992.
2 - Conifer is not classified as a stand unless it occupies 50% or more of the stand. Areas with mixed conifer/hardwood are those with less than 50% conifer.

A discussion of the conifer, permanent opening and riparian community types will be presented here followed by a discussion of Management Indicator Species and the communities they represent.

Conifer (hemlock/white pine/red pine, etc.) - The presence of conifer throughout the forest provides an important habitat component for several species. White-tailed deer, eastern cottontails, and several bird

species that winter on the ANF utilize conifer for winter thermal cover. The ruby-throated hummingbird uses the eastern hemlock for nesting, and the red squirrel uses spruce and hemlock cones as a food source. Conifer comprises at least 3.6 percent of the ANF. Conifer is found in all Management Areas and can be a component of all forest types. Bald eagle are known to utilize scattered super-canopy white pine found in the river and large stream corridors as nest sites.

Permanent Openings - Permanent openings, often called non-forest, consist of grass and shrub openings, utility rights-of-way, abandoned and revegetated roads, and naturally occurring openings. About 5 percent of the ANF is comprised of permanent openings that provide brood habitat for grouse and turkeys and nesting habitat for field sparrows, song sparrows, and several other songbirds. At least 15 avian species and 24 mammals utilize upland herbaceous openings on the ANF, while an additional 21 avian species nest in overstory trees that may be scattered throughout these openings or along the edge (Linda Ordiway, pers. comm.). The total number of amphibians, reptiles, birds, and mammals known to utilize non-forest habitats in the Northeast is provided in Table 21. Openings found in riparian areas are utilized by Bald eagle for foraging. Indiana bats sometime forage and roost near the edges of openings (Romme *et al.,* 1995).

Riparian - Riparian areas provide habitat for a diverse assemblage of wildlife. Riparian areas include seeps, wetlands, and streamside zones along rivers, lakes, creeks, and streams. These areas provide important breeding habitat for a diverse assemblage of amphibians (e.g. Northern dusky salamander) and reptiles (e.g. wood turtle), as well as birds (e.g. Northern water thrush) and mammals (e.g. raccoon). The total acreage of riparian habitat on the ANF has not been calculated. Riparian areas provide foraging habitat for Bald eagle and Indiana bat. Riparian vegetation plays an important function in maintaining suitable water quality to sustain Clubshell mussel and Northern Riffleshell mussel habitat in the Allegheny River.

Exotic Species

Species considered non-native to Pennsylvania are called exotic or alien species. More than 37% of the vascular plants now growing in Pennsylvania are exotics. A 1997 survey on the Allegheny National Forest by Dr. Charles Williams found 590 records of alien plants.

The North American Non-Indigenous Arthropod Database estimates 152 exotic arthropods currently inhabit Pennsylvania. Some are considered serious pests such as the gypsy moth. Other exotic invertebrates that are not insects include species such as the zebra mussel. For additional information on zebra mussels see the Biological Opinion on the Impacts of Forest Management and Other Activities to the Bald Eagle, Indiana Bat, Clubshell, and Northern Riffleshell on the Allegheny National Forest, Pennsylvania, June 1, 1999 (pg. 41&42).

Five species of exotic birds reside in Pennsylvania and the Allegheny National Forest. They include the rock dove, European starling, house sparrow, ring-necked pheasant, and mute swan.

The Ohio River drainage, which includes the Allegheny National Forest, contains 11 exotic fishes. Some of these exotics, such as the rainbow trout, were purposely introduced.

No exotic mammals, reptiles, or amphibians are known to be reproducing on the Allegheny National Forest.

Management Indicator Species

The management indicator species (MIS) approach provides the basis for analysis of effects to all wildlife species that utilize the ANF without the complexity of addressing each species individually. Thirteen wildlife and three fish species representing a variety of habitats were selected to monitor trends in habitat capability (Forest Plan EIS, p. 3-22).

Early Successional Species (0 to 19 years old)

Habitat for species that rely upon early successional conditions is provided primarily in the permanent openings, riparian areas, and even-age regeneration harvests that occur throughout the ANF, within

Management Areas (MA) 1 and 3. MA 1, which encompasses 7,000 acres, has a primary purpose of providing early successional habitat for ruffed grouse and other species associated with early successional stages of forest habitat. The Forest Plan allows for as much as 25 percent of MA 3 to be in the early successional stage. Existing Forest Plan S&G's include requirements for the retention of den trees, snags and clumps of vegetation following even-age regeneration harvest across the ANF and specific management objectives for MA 1.

American Woodcock - This migratory game bird utilizes early successional habitats usually associated with wet soils. Permanent openings are used during courtship while wet shrub and sapling areas provide feeding sites. Monitoring data shows a fluctuating but relatively stable woodcock population on the ANF.

Ruffed Grouse - This game bird utilizes early successional deciduous habitat often in association with scattered grassy openings and scattered hemlock and white pine. Aspen in a variety of age classes provides a food source as well as cover. Grouse populations are cyclic but stable on the ANF.

White-tailed deer - Early successional forests provide both food and cover for white-tailed deer. Populations have remained above objective levels throughout the ANF for more than 20 years. Harvest of female deer has been shown to be the most effective means of managing deer populations.

Mature/Late Successional Species (51+ years old)

Habitat for species that rely upon mature/late-successional conditions is a primary management emphasis in Management Areas 5, 6.1, 6.4, 8, and 9.1 (141,000 acres), and in areas of smaller concentrations (minimum of 5%) within all other MA's. Mature/late successional habitat found on sites where Bald eagles are known to nest and are most likely to nest (side slopes surrounding the Allegheny Reservoir and on the side slopes along the Allegheny River, Tionesta Creek, Clarion River, Kinzua Creek, and Salmon Creek) provides potential nesting sites. This habitat also provides large diameter live and dead trees that can be used as roosts by Indiana bat. Canopy closures may be higher than what is described for roost and foraging habitat depending on the amount and extent of canopy gaps that have formed as a result of tree mortality or wind throw.

Pileated Woodpecker - This species is the largest woodpecker that inhabits the ANF. It excavates cavities in large diameter trees for nesting, consequently mature forests are required. Pileated woodpeckers are common and stable on the ANF (Brauning, 1992).

Red-shouldered Hawk - This large buteo nests in mature forests often in valley bottoms with small clearings and marshes intermixed. The ANF contains one of the highest densities of this raptor in Pennsylvania. Within PA and the Northeast, red-shouldered hawk populations appear to remain relatively stable. Pennsylvania lists this species as vulnerable although the Pennsylvania Breeding Bird Atlas recorded this raptor in a total of 745 blocks and confirmed breeding in 134 blocks (Brauning 1992). Titus and Fuller (1990) found no discernable population trends when evaluating counts or red-shouldered hawks migrating past six Eastern hawk lookouts between 1972 and 1987. These data suggest that habitat is of sufficient quality, distribution, and abundance to allow the species population to stabilize and to be well distributed across the ANF resulting in a high likelihood of persistence.

Great Blue Heron - Due to its preference for large trees for nesting and its sensitivity to human disturbance, this species is an indicator of late-successional forest conditions. Nesting colonies (rookeries) are often situated on isolated ridge tops throughout the ANF even though streams and rivers are preferred foraging sites. Great blue heron populations are stable on the ANF.

Timber Rattlesnake - This species is an indicator of mature forests containing suitable rock outcroppings for denning and basking. Rattlesnakes are often found on southern exposures or near streams during the spring and summer months. These snakes usually return to the same den site each fall. Several denning areas have been identified throughout the ANF. The primary cause of mortality in this species is most likely persecution by humans and not forest management activities. Many people are afraid of snakes and will kill any with which they come in contact. Some people collect rattlesnakes and use them in rattlesnake roundups

or rodeos. The Pennsylvania Fish and Boat Commission is the state agency responsible for managing reptiles and has placed more stringent regulations on the collecting of rattlesnakes.

Recently the ANF placed timber rattlesnakes on the Regional Forester's sensitive species list. More data is needed to determine population trends for this species although current data suggests that habitat is of sufficient quality, distribution, and abundance to allow the species population to stabilize but with gaps in the historic distribution of the species on the ANF. These gaps cause some limitation in interaction among local populations resulting in a moderate likelihood of persistence.

Mature Mixed Hardwood/Conifer Species

Habitat for species that rely upon mature mixed hardwood/conifer trees are found as inclusions within many forested stands. There are no MA's that specifically emphasize this habitat condition, however it is likely to develop in similar locations as the Mature/Late Successional habitat described above. When found on sites where Bald eagles are known to nest and are most likely to nest (side slopes surrounding the Allegheny Reservoir and on the side slopes along the Allegheny River, Tionesta Creek, Clarion River, Kinzua Creek, and Salmon Creek), this community type provides potential nesting sites for Bald eagle.

Hermit Thrush - This is a ground-nesting species and is an indicator of a mature mixed hemlock community. Although primarily a forest interior bird, it often occurs along edges and small clearings within wooded areas created by disturbances such as logging, drilling, or fires. Populations in northwestern Pennsylvania appear to be stable (Brauning, 1992).

Black-throated Green Warbler - This is an upper canopy nester that prefers mature mixed hardwood forests for nesting and forages in both deciduous and coniferous trees in the middle to upper levels of the canopy. The wide distribution of conifer across the ANF provides suitable habitat for this species, which appears stable and abundant.

Barred Owl - This species nests in mature or late-successional forests often with a conifer component. Preliminary analysis of monitoring data indicates a stable population on the ANF.

Species Requiring Regenerating Conifer

Conifer regeneration occurs in scattered locations across the ANF and is not a primary management emphasis of any MA. It does not provide habitat for the T&E species discussed in this document.

Magnolia Warbler - This species is an intermediate canopy nester and is an indicator of a regenerating hemlock community, woodland edges, and clearings. It is well distributed throughout the ANF and appears to be stable.

Cavity Nesting Species

Habitat for cavity nesting species is plentiful throughout the ANF. Forest Plan S&G's that require the retention of den and snag trees and clumps ensure that this habitat will be found throughout the ANF.

Yellow-bellied Sapsucker - This species nests in cavities in mature deciduous forests. Suitable habitat is widespread across the ANF and populations appear to be stable.

Species Preferring Aspen

Habitat for species that rely upon aspen is provided primarily within Management Area 1 (MA). Management Area 1, which encompasses 7,000 acres, has a primary purpose of providing early successional habitat for ruffed grouse and other species associated with early successional stages of forest habitat. Aspen is also found in minor amounts at scattered locations within all other MA's. Aspen does not generally provide habitat for Bald eagle or Indiana bat, however Indiana bat could roost along the perimeter of areas being regenerated to aspen.

Beaver - This species is an indicator of riparian habitat conditions particularly with an associated aspen component. Beaver populations have greatly expanded across the ANF since the Forest Plan was approved in 1986.

Aquatic Species

Habitat for aquatic species is provided throughout the ANF. Each of the species listed below indicates different aquatic conditions. Clubshell mussel and Northern Riffleshell mussel are both found in the same aquatic habitat as walleye and smallmouth bass.

Brook Trout - This species is an indicator of good water quality conditions in cold-water streams throughout the ANF. Most cold-water streams on the ANF contain productive brook trout populations. ANF personnel have been monitoring long-term population trends in the same four streams since 1991. Populations appear to be stable, fluctuating with weather conditions that affect flows.

Walleye - This species requires cool water conditions as found in the Allegheny Reservoir and Allegheny River. Habitat is limited to these two areas on the ANF. The walleye is a demand species (sought after game fish and whose population is influenced by artificial stocking) and not an ecological indicator. The walleye population does fluctuate in the Allegheny Reservoir, probably as a result of several factors affecting the survival of the stocked fry. This species has been monitored annually by U.S. Army Corps of Engineers and ANF personnel since the Forest Plan was approved (1986), but was changed to a demand species in 1996 since its numbers are influenced by stocking in the Reservoir where they are monitored.

Smallmouth bass - This species requires cool water conditions and is found in the Allegheny Reservoir and larger streams and rivers. Personnel from the U.S. Army Corps of Engineers and the ANF have monitored it annually in the Allegheny Reservoir. The population does fluctuate from year to year as a result of year class success.

Federally Proposed, Endangered, or Threatened Species and Regionally Sensitive Species

The Federally Proposed, Threatened, or Endangered Species and Regionally Sensitive Species List (PETS species) for the ANF includes 31 species (Table 21). A detailed discussion of the 31 species and an analysis of potential impacts associated with the alternatives proposed in this document are addressed in the Biological Assessment for Forest Plan Amendment #11 Threatened and Endangered Species Allegheny National Forest (Appendix D). The only terrestrial sensitive species that could be adversely affected by the proposed action is the Northern long-eared bat. Discussion for this species will be provided here. Discussion of Bald eagle, Indiana bat, Clubshell mussel and Northern Riffleshell mussel is provided on pages 2 through 12. A detailed discussion of potential habitat for each species is contained in Appendix D.

The following terms are used in Table 22,on the following page:

Endangered - Species is federally listed as endangered under the Endangered Species Act.
Threatened - Species is federally listed as threatened under the Endangered Species Act.
Proposed - Species is currently under review for federal listing and is ready to be listed.
Sensitive - Species is listed on the USDA Forest Service Eastern Region Sensitive Species.

Table 22. Federally Proposed, Threatened, or Endangered, and Regionally Sensitive Species for the ANF

Species	Species Status
Reptiles	
Timber rattlesnake (*Crotalus horridus)*	Sensitive
Birds	
Bald eagle (*Haliaeetus leucocephalus*)	Threatened[1]
Yellow-bellied flycatcher (*Empidonax flaviventris)*	Sensitive
Mammals	
Indiana bat *(Myotis sodalis)*	Endangered
N. Long-eared bat (*Myotis septentrionalis)*	Sensitive
Northern water shrew (*Sorex palustris*)	Sensitive
Invertebrates	
Clubshell mussel (*Pleurobema clava*)	Endangered
N. Riffleshell (*Epioblasma torulosa rangiana*)	Endangered
Green faced clubtail (*Gomphus viridifrons*)	Sensitive
Long-solid mussel *(Fusconaia subrotundra)*	Sensitive
Harpoon clubtail (*Gomphus descriptus)*	Sensitive
Rapids clubtail (*Gomphus quadricolor)*	Sensitive
Mustached clubtail (*Gomphus adelphus)*	Sensitive
Midland clubtail *(Gomphus fraternus)*	Sensitive
Ski-tailed emerald (*Somatochlora elongata)*	Sensitive
Uhler's sundragon (*Helocordulia uhleri)*	Sensitive
Maine snaketail (*Ophiogomphus mainensis)*	Sensitive
Zebra clubtail (*Stylurus scudderi)*	Sensitive
Plants	
Small whorled pogonia (*Isotria medeoloides*)	Threatened
Wiegands sedge (*Carex wiegandii*)	Sensitive
Butternut (*Juglans cinerea*)	Sensitive
Creeping snowberry (*Gaultheria hispidula)*	Sensitive
Thread Rush *(Juncus filiformis)*	Sensitive
Rough cotton-grass (*Eriophorum tenellum)*	Sensitive
Fishes	
Spotted darter (*Etheostoma maculatum*)	Sensitive
Tippecanoe darter (*Etheostoma tippecanoe*)	Sensitive
Longhead darter (*Percina macrocephala*)	Sensitive
Mountain brook lamprey *(Ichthyomyzon greeleyi)*	Sensitive
Gravel chub (*Erimystax punctata)*	Sensitive
Channel darter (*Percina copelandi)*	Sensitive
Gilt darter *(Percina evides)*	Sensitive

1 - The bald eagle is proposed for de-listing.

Northern Long-eared Bat

The Northern long-eared bat (formerly called Keen's Myotis) is a Regionally designated sensitive species that roosts singly or in small colonies in crevices under loose tree bark, on cliff walls, or in caves (DeGraaf and Rudis 1986). Females seek attics, barns, and tree cavities for small nursery colonies. Maternity habitat may be slightly different from that of the Indiana bat, in that the northern Long-eared may use buildings and cavities more frequently than the Indiana bat. In New Hampshire, Sasse and Pekins (1996) found Northern long-eared bats roosting in snags with larger diameters, greater height, and more bark than available snags in

the surrounding forest. Canopy closure of occupied roost stands was also lower than in adjacent stands. This bat typically forages over ponds and clearings and high along the forest edge. For hibernation, the Northern long-eared bat seeks caves or mine shafts with temperatures near 40 degrees Fahrenheit (DeGraaf and Rudis 1986).

In Pennsylvania, between 1980 and 1995, 69 of 366 caves were found to contain Northern long-eared bats (PA Game Commission, 1995 unpublished). In 1995, 12 of 33 caves surveyed contained Northern long-eared bats (PA Game Commission, 1995 unpublished)

During the 1998 ANF survey, this bat was recorded at 18 of the 25 survey sites and captured at 13 of the sites (Gannon, 1999 unpublished). Of the 25 sites surveyed in 1998, Northern long-eared bats were recorded at 6 of the 7 sites where Indiana bats were detected. An additional 33 sites were surveyed in 1999. Based upon the combined 1998 and 1999 survey data, the Northern long-eared bat appears to be one of the more common forest dwelling bats on the ANF.

Maintaining large snags and surveying for bats prior to demolition of old buildings are the primary management actions directed towards the conservation of this species on the ANF.

There is overlap between the habitat requirements for Northern long-eared bat and Indiana bat.

Aquatic Resources

The ANF provides suitable habitat for a variety of cold, cool, and warm-water species of fish. There are 71 species of native and wild fish that have been documented within the ANF. Game fish include species of trout, bass, walleye, muskellunge, and others, and many more non-game fish including species of darters, dace, minnows, and others. Numerous environmental variables can influence the abundance and diversity of fish. These include such things as productivity of water and habitat quality. The productivity of water is the primary factor, and habitat is the second factor affecting fish abundance. The lack of pools and deep-water areas are the most limiting habitat variables in headwater streams.

Aquatic insect surveys have been conducted across the ANF in numerous headwater streams by several agencies and entities. The result of these surveys show there is good aquatic insect diversity, with a number of pollution sensitive species (e.g. stonefly, mayfly, caddis fly) present. One stream within the 13 percent subsection (Brown's Run) was recently surveyed by PA-DEP and had such a good aquatic insect population that it was recommended to be upgraded from **Cold-Water Fishery** to **Exceptional Value** status. Also, using a functional group analysis in numerous streams, it was found that stream substrate attachment sites were plentiful, implying an abundance of larger sized particles that provide suitable habitat for the colonization of aquatic insects.

The Allegheny River provides suitable habitat for the two Federally endangered freshwater mussels, the Clubshell mussel (*Pleurobema clava*) and the Northern Riffleshell mussel (*Epioblasma torulosa rangiana*). A survey conducted in 1989 (WPC 1989) documented their presence in the river near the seven federally designated Wilderness Islands, which are managed by the ANF. In 1994, another survey was conducted in 10 smaller streams across the ANF to determine their distribution. One of these streams, East Hickory Creek, drains directly into the Allegheny River. None of the 10 streams were inhabited by the two endangered mussels, and only two of the 10 streams were inhabited by any mussel species. It is believed that the reason for the paucity of mussels in these smaller drainages is that ANF streams are generally less buffered, more acidic, have medium to high gradients, and are colder than optimum for mussels (Bier *et al.*, 1997).

One of the biological concerns related to continued existence of Clubshell mussel and Northern Riffleshell mussel populations in the Allegheny River is the potential introduction of the Zebra mussel, an exotic species, into waters in and around the ANF. Zebra mussels can interfere with the normal activity (feeding, respiration, and locomotion) of native mussels. The level of infestation determines the degree of mortality. Current populations within the Allegheny River are only known to exist as far north as Lock 7 at Kittaning, PA, outside of Pittsburgh. The closest known population to the ANF in the upper Allegheny River

watershed is in Chautauqua Lake in New York. The outflow of Chautauqua Lake eventually flows into Conewango Creek, which then flows into the Allegheny River at Warren. Zebra mussels have the potential to be spread into the Allegheny Reservoir and Allegheny River by boats, bait buckets and movement during high flows from infested areas upstream. They also have the potential to be introduced at various private, state, tribal, and Federal boat launches not operated by the ANF. Numerous surveys have been conducted in the Allegheny River, Conewango Creek and the Allegheny Reservoir since the early 1990's, but no Zebra mussels have been detected to date.

SOCIAL/ECONOMIC CHARACTERISTICS

Heritage Resources

Heritage resources are the physical remains left by people who occupied or visited an area in prehistoric (pre-settlement by Europeans) or historic (post-European settlement) times. There are over 2,000 known heritage resource sites recorded on the ANF. These resources reflect over 10,000 years of prehistoric human use and 250 years of historic human use of the land area now encompassed by the ANF. Prehistoric period remains are frequently found along drainages and in areas of rock outcrops. Remains of the first Europeans to visit the region (dating to the early to mid-1700's) have also been found. Historic sites of early logging and oil and gas activities are abundant.

While a complete inventory of heritage resources has not been made, there are areas of the ANF that have higher likelihood of further heritage resource discovery than others. The Allegheny River, north of Franklin, PA is known to have a high density of Paleo-Indian sites (Lantz 1984). The Allegheny River valley also embraces a high density of archaic and woodland period sites. Buckaloons (Irvine Flats) is identified as a major multi-component site that includes a concentration of almost every major archaeological time period identified in the Allegheny River valley (Lantz 1989). Other major drainages, such as the Clarion River and Tionesta Creek, are less well known in terms of their archeological resources. What is known suggests that prehistoric use of these drainages was a part of the settlement-subsistence system of the various cultural groups concentrated along the Allegheny River through time. Plateau sections of the ANF have more dispersed potential for heritage resource discovery, however both prehistoric and historic resources are likely to be present.

ANF heritage resource program management centers on inventory and identification of resources. A limited amount of site excavation occurs. Buckaloons is a concentration of sites that has been and continues to be of interest to archeological research since the late nineteenth century to the present day. Recent investigations have focused on controlled surface collections. Test excavations have also been conducted in selected sample areas.

Visual Resources

A wide variety of visual resources is present across the ANF; these scenic qualities are created by the unique topography and vegetative resources of the Allegheny plateau. A variety of scenery, from the highly distinctive deep valleys with large water features and continuously forested side slopes of the major river corridors such as the Allegheny, Tionesta and Clarion Rivers to the more common moderately dissected valleys of small to medium sized streams is found throughout the ANF. From the most highly used travel ways and use areas, from the mid to background distances (1/4 to 1 mile and beyond), the forest appears natural due to its continuous forested canopy with only occasional openings caused by savannah stands and more recent timber harvest. The small savannah or orchard stands are found in some drainages and these areas are dominated by grasses, wildflowers and ferns with scattered trees, giving a distinctly pastoral scene adding visual variety primarily at foreground distances.

The present forest is dominated by light loving species such as Black cherry, White ash, Red maple, and a variety of oaks. White pine and Eastern hemlock are also found. Hemlock is generally found as an understory or midstory species and provides some visual variety when seen in the foreground distance (0-1/4

mile). White pine is found in small clumps or as scattered remnant specimens towering above the normal canopy. These also provide some visual variety at a foreground distance.

Recreation Resources

The ANF provides a full spectrum of recreation facilities and opportunities, with approximately 3.9 million recreation visitor days reported in 1998 (1 recreation visitor day (RVD) = 12 hours of use by one person). The recreation resources most pertinent to this analysis are those related to power boating and canoeing that occur on the Allegheny Reservoir and Allegheny River, and trail systems located within the 13 percent subsection.

The 12,080-acre Allegheny Reservoir (7,783 acres of which are found within the ANF proclamation boundary) is a major attraction for ANF visitors. Portions of the Allegheny River (totaling 86.6 miles) are designated as a Wild and Scenic River. The majority of the ANF's developed recreation facilities are centered around the Allegheny Reservoir. The proposed action and the alternatives have the potential to affect developed recreation facilities and uses associated with the reservoir and the Allegheny River, therefore the affected environment and environmental effects for these facilities will be described for the entire ANF, the Allegheny River and the Allegheny Reservoir. The trail system will be described for the entire ANF and the 13 percent subsection. Recreation use figures will be developed for the entire ANF, the Allegheny River and the Allegheny Reservoir.

Recreation Facilities

Allegheny Reservoir and Allegheny River Facilities

The number of facilities the Forest Service operates across the ANF and in association with the Allegheny Reservoir and Allegheny River is displayed in Table 23. The Allegheny Reservoir is a focal point for the most highly developed recreation facilities found on the ANF. The 16 developed sites along the reservoir range in character from semi-primitive to highly developed. The opportunities for boating related activities are a primary reason why people are attracted to the campgrounds surrounding the reservoir. There are 9 campgrounds located along the reservoir with over 400 campsites (5 campgrounds are semi-primitive and accessible only by boating or hiking). The remaining campgrounds are highly developed and accessible by vehicle. Boating, fishing, and water play are major recreation activities that occur at the reservoir. There are eight boat launches (two with fishing piers) and one full service marina that provide water access. In addition, there are many associated facilities including five picnic areas, two beaches and two overlooks.

Table 23. ANF Developed Recreation Facilities

Facility Category	# of Facilities on the ANF	# of Facilities on Allegheny Reservoir	# of Facilities on Allegheny River
Camp, Picnic, and Swim	31	16	3
Boating Access	13	9	1
Other	10	4	1
TOTALS	54	29	5

At the present time, two boats launch and two overlook/picnic areas are operated by ANF personnel. The remaining ANF facilities are operated under special use permits by two private concessionaires. The marina is a private facility operated under a special use permit.

ANF facilities along Allegheny River corridor are operated by ANF personnel and include the Buckaloons campground, picnic area, and boat launch and the Tidioute overlook and picnic area. The land area along the river is interspersed with private ownerships and private commercial/industrial/residential facilities. There are six other boat access sites operated by the Pennsylvania Fish and Boat Commission (4), Corps of

Engineers (1), and Tidioute Borough (1) in the section of the river within the proclamation boundary of the ANF between the Kinzua Dam and Tionesta.

Trails

A highly developed trail system including non-motorized and motorized trails is found on the ANF. Some areas of the ANF receive high amounts of equestrian use on existing travel ways (open roads, abandoned roadways and railroad grades, and commercial outfitter/guide-maintained trails), however, no trails are designated by the ANF as equestrian trails. Equestrian use on hiking trails is prohibited. Table 24 displays total ANF trail miles and trail miles found within the 13 percent subsection.

Table 24. ANF Trail Systems

Type of Trail	Forest Total (miles)	13% Subsection (miles)
Non-motorized	239	29
Motorized	466	41
Equestrian, summer (managed under special use permit)	36	33

Surveys completed in 1999 within the 13 percent subsection show that all non-motorized trail miles and 36 of 41 motorized trail miles meet or exceed Forest Plan standards. There are approximately five miles of the Rocky Gap ATV and Bike Trail that do not meet Forest Plan standards. Reconstruction scheduled for calendar year 2001 will remedy the condition of these sections of trail.

There are 33 miles of equestrian trail found within the 13 percent subsection which are managed under a special use permits to commercial outfitters/guides. Evaluation surveys completed this year show that no remedial work is needed.

Recreation Use

The recreation use related to this analysis will be described by four categories of use within three geographic categories (Table 25).

Table 25. Recreation Visitor Days by Activity, 1998.

Activity	RVD's* (entire ANF)	Allegheny Reservoir RVD's	Allegheny River RVD's
Mechanized Travel and Viewing Scenery (Includes Boating)	1,805,000	1,245,500	108,300
Camping, Picnicking, Swimming	1,032,000	774,400	82,400
Hunting, Fishing	369,000	169,700	68,900
Other (Hiking, Canoeing, Nature Study, Gathering Forest Products)	700,000	254,600	132,200
TOTALS	3,906,000	2,444,200	391,800

**** 1 RVD = 12 hours of use by one person***

Economics

The ANF provides direct opportunity for employment for many local people including timber operators, oil and gas developers, construction contractors, and recreation providers. There are also indirect employment opportunities created by increases in the economy through the services provided to recreation users (i.e., gas

stations, restaurants, etc.) and secondary wood processing facilities. In addition to jobs, recreation use brings additional dollars into the local economy that adds to its health and well-being.

Economics Related to Recreation Use

Recreation use and associated revenues may be affected by the proposals in this Forest Plan amendment. Analysis indicates that total use on the Allegheny River will change only slightly through actions proposed in this EIS. Therefore, all economic discussions will be based on Allegheny Reservoir data.

Recreation use associated with ANF facilities on the Allegheny Reservoir generated fees totaling over $334,500 in 1998. Equally as important, these recreation activities contribute heavily to the economy of the four counties surrounding the ANF. Estimates of revenues generated by the local economy are directly related to the number of RVD's that occur on the ANF each year. By applying the multiplier coefficients generated in the Forest Plan analysis to 1998 RVD data we estimate that recreation use adds about $2,480,000 dollars annually to the local economy per each million RVD's of use. Table 26 summarizes recreation use, fee collections and effects to local economy associated with the Allegheny Reservoir during 1998.

Table 26. Allegheny Reservoir Recreation Use and Fees, 1998.

Recreation Type	Allegheny Reservoir RVD's	Fees Collected	Revenue Added to the Local Economy
Camping	774,400	$251,461	$2,124,864
Traveling related includes boating	1,245,500	$83,118	$3,088,840
Hunting, fishing	169,700	0	$420,856
Canoeing, hiking	254,600	0	$631,408
Total	2,444,200	$334,500	$6,061,616

Timber Harvest Values

Timber harvest values are very high on the ANF, primarily due to the exceptional quality of Black cherry. Black cherry veneer is very desirable for use in fine furniture, and the Black cherry on the ANF is especially high quality. The ANF supplies about one-third of the world's Black cherry veneer, and 42 percent of the United States commercial supply.

Through the end of November 1999, the all-time high price for Black cherry sawtimber sold in an ANF timber sale was $2,276 per thousand board feet (MBF), which occurred in 1995. In 1997, it sold for as much as $2,225 per thousand board feet (MBF). However, a timber sale offered in early December 1999 set a new record high price for Black cherry at $4,056.62 per MBF. Each of the 737 Black cherry trees offered in that sale averaged $1491.65 per tree.

Between 1991 and 1997, the total annual value of timber sales awarded through the competitive bidding process has ranged from $17 million to $29 million, with an average annual value of $21 million. During that same time period, the amount of sawtimber in those awarded sales ranged annually from 21 million board feet (MMBF) to 39 MMBF, with an average of 30 MMBF. For those same years, pulpwood awarded ranged from 16 MMBF equivalents (~2 cords of pulpwood equal 1 MBF) to 41 MMBF equivalents, with an average of 27 MMBF equivalents. Timber harvesting produces added local and regional benefits by creating 298 jobs related to the industry.

Allegheny National Wild and Scenic River

On April 20, 1992 Congress passed legislation that amended the 1968 Wild and Scenic Rivers Act (P.L. 90-542, 1968) by including three segments of the Allegheny River in the Nation's Wild and Scenic River

system. There are 86.6 miles of river located in Warren, Forest, and Venango Counties included in this designation. In 1996, ANF personnel completed the FEIS for the Allegheny National Wild and Scenic River Management Plan. However, with authority for only the Federal ownership within the river corridor, implementation of the management plan is heavily dependent on voluntary participation by state and local government agencies and private landowners.

Habitat for Bald eagle is found within the river corridor. One active nest is located on a private island south of Tionesta, just outside the ANF proclamation boundary.

Summer roost and foraging habitat for Indiana bat is widespread within the river corridor, although the quality or extent of habitat has not been quantified.

Both the Clubshell mussel and Northern Riffleshell mussel have been found in the Allegheny River near the ANF Wilderness Islands and other locations in the designated reaches.

Plans and Programs of Other Agencies

There are numerous Federal, state, tribal, county and local agencies located within and around the four-county area that includes the ANF that are potentially affected by the proposed action.

Recreation Providers

There are five other agencies that provide boat access on the Allegheny Reservoir or Allegheny River in addition to the facilities provided on the ANF. There are two developed boat launches located in New York State - Onoville Marina, operated by Cattaraugus County, NY, and Highbanks, operated by the Seneca Nation of Indians - that provide access to the Allegheny Reservoir. There are several undeveloped launch sites along the Allegheny River in New York State. There are six public launch sites located downstream of the Kinzua Dam on the Allegheny River. Four are operated by the Pennsylvania Fish and Boat Commission, one by Tidioute Borough, and one by the U.S. Army Corps of Engineers at Kinzua Dam. The Corps of Engineers also manages the Tionesta Dam and Reservoir located at the southwest corner of the ANF at the mouth of Tionesta Creek as it enters the Allegheny River. In addition, there are numerous undeveloped sites located along the river in PA.

County Governments

The four counties encompassing the ANF (Elk, Forest, McKean, and Warren) receive payments from the Federal government to offset the absence of tax revenues from Federally-owned land within the Counties. These payments, administered by the county governments, are used for schools and roads. Historically, the payments have amounted to 20-25 percent of the Counties' budgets. In 1998, the average payment to each county was $1,450,000. Of this, 99.5 percent was generated from timber receipts, and 0.05 percent was generated from non-timber receipts (including recreation). There is a potential for a reduction in payments to be made to county governments as a result of alternatives considered in this analysis as a result of both reduced recreation receipts and timber values.

Safety

Safe conditions for forest workers and visitors are impacted by the present distribution of dead trees that are found across the ANF landscape. Standing dead trees, particularly those with large limbs and branches pose a threat to people, especially during periods of high wind. Recreation sites, trail corridors and other high visitor use areas receive frequent inspections to identify and remedy unsafe conditions. The majority of ANF acres are not inspected for visitor or forest worker safety.

CHAPTER 4 - ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter is the scientific and analytical basis for comparing the alternatives. On a broad scale, it describes the expected consequences of implementing each alternative on a programmatic level in terms of the physical, biological and socio-economic effects. Each element is discussed separately. Effects can be direct, indirect, or cumulative.

In this analysis, the proposed action (Alternative 1) is to implement twelve additions and three changes to standards and guidelines and additional monitoring requirements for five T&E species. In addition, reference to Bald eagle is dropped from an existing S&G, and one existing S&G is dropped. The discussion that follows in this section will address how changes or additions to S&G's affect the resource management as outlined in the Forest Plan. The S&G numbers discussed in this section are found in Chapter 2, Table 2.

In this analysis, Alternative 3 (No Action) serves as a baseline for comparative purposes. It represents the current management situation. The effects of changing, deleting or adding to existing Forest Plan S&G's and monitoring plan in Alternatives 1 and 2 can be addressed by comparing proposed changes with what occurs in Alternative 3. Even though the changes proposed in Alternatives 1 and 2 could be implemented through administrative action in Alternative 3, for comparative purposes, it will be assumed that no change from current direction would occur.

The Biological Assessment for T&E Species on the ANF (December 1998) provides detailed documentation of how Forest Plan approved activities or existing standards and guidelines affect T&E species. Pertinent findings of that analysis will be summarized here. Refer to the BA for more detailed information.

Discussion related to the physical, biological and social/economic characteristics will be presented for the various resource elements that pertain to each. The effects of implementing Alternatives 1, 2 and 3 will be presented for each resource elements.

Proposed S&G 13 in Alternatives 1 and 2 requires that the demolition or removal of buildings or other man-made structures should occur when bats are hibernating. This proposed S&G has no effect on any of the resource elements being discussed in the remainder of this chapter; therefore it is only addressed here. It does however, result in a coordination effort that must be made at the time that demolition or removals take place. If it is absolutely necessary to remove the structure when bats might be present, the structure must be examined for the presence of Indiana bats by a bat expert prior to removal.

The effects of dropping the reference to Bald eagle in an existing S&G (Forest Plan pg 4-38) and the effects of dropping requirements to complete small-whorled pogonia surveys (Forest Plan pg 4-39) will not be addressed further in the document. Existing guidelines for buffer zones to protect Bald eagles are revised with new buffer zone requirements. The effects of this change are discussed in the following sections. Small whorled pogonia survey requirements are being added to the monitoring plan. The effects of changes to the monitoring plan are also discussed.

PHYSICAL CHARACTERISTICS

Forest Location, Climate, Topography, Air Quality, and Soils

Current condition of these elements of the environment is discussed in Chapter 3 of this EIS. All of the alternatives have no effect on these elements. The effects are correctly represented by current discussion in the Forest Plan FEIS Chapter 4. Therefore, they will not be addressed further.

Roads

In summary, there could be negligible impacts to road management and road construction practices as a result of S&G's proposed in Alternatives 1 and 2. The changes that would occur are minor and, when

considered at the programmatic level, result in virtually no change to effects previously discussed in the Final Environmental Impact Statement (FEIS) prepared for the Forest Plan (FEIS, pp. 4-30 through 4-37), i.e., Alternative 3 in the current analysis. At the site-specific level, there could be impacts that are discussed below. In Alternative 3 no new S&G's would be added to the Forest Plan. Road management would continue to be guided by the S&G's currently in the Forest Plan.

S&G's 1- 5

Alternatives 1 and 2 - Proposed S&G's 1 through 4 modify existing requirements for buffer zones surrounding Bald eagle nests (both active and inactive) and identify individual trees to be retained for future habitat needs. Proposed S&G 5 requires that activities within 1,320 feet of a roosting area be restricted to minimize take of roosting Bald eagles. Road management could be impacted by S&G 1 and 5. Restrictions on access within the buffer zones could result in the possible need for road closure or seasonal restriction on road use in the event a Bald eagle constructed a nest near an existing Forest Service road. Monitoring of a new nest would be needed to determine if road use was having an adverse impact on the nest, and appropriate course of action would be taken following consultation with FWS. New nests could also impact the future construction of Forest Service roads. Identification of roosting areas could result in changes to road management practices. Further consultation with FWS would be needed to determine the appropriate course of action. The impact of these modified S&G's is expected to be negligible for several reasons.. There do exist S&G's that already call for similar buffers and time of year restrictions. The changes proposed here bring the Forest Plan S&G's into compliance with what is included in the terms and conditions of the BO and the Bald Eagle Recovery Plan, but result in minor differences in implementation. In addition, little road construction is anticipated in areas where Bald eagles are most likely to nest (side slopes surrounding the Allegheny Reservoir, Allegheny River, Tionesta Creek, Clarion River, Kinzua Creek, and Salmon Creek). In the event new nests were found in areas where road construction is planned, the relocation of an individual road, at the programmatic level, would have a negligible impact.

S&G's 6-12

In Alternatives 1 and 2, proposed S&G's 7 through 10 modify existing requirements for retaining dead and live trees following different kinds of timber harvests. Road management and road construction would not be limited by these S&G's. Proposed S&G 12 establishes the requirement to protect roost trees. It is conceivable that a roost tree could be discovered within the clearing limits of a proposed road location or nearby where it could present a safety hazard (in the case of a dead tree) to people who would use the road. In the event this occurs, additional consultation with FWS would be needed to determine the appropriate course of action.. This is an negligible change at the programmatic level for the same reasons as discussed above for S&G's 1-5.

S&G's 14-15

In Alternatives 1 and 3, all Forest Service boat ramps would remain open, facility use would be similar, and little difference is anticipated in road use and road management or maintenance. Therefore, the Forest Plan FEIS discussion of effects on road management (Forest Plan FEIS, pp. 4-30 through 37) applies equally to both Alternative 1 and Alternative 3.

In Alternative 2, proposed S&G 14 closes all Forest Service boat ramps on the Allegheny River and the Allegheny Reservoir. Road use and maintenance would decrease accordingly on a limited number of roads used by recreationists on the ANF, but other Forest Plan FEIS discussion would remain applicable to Alternative 2.

Proposed S&G 15 in Alternatives 1 and 2 results in a change in the way buffer zone widths are calculated. This change brings the Forest Plan in agreement with the Best Management Practices outlined by the State of PA. The change in calculation results in a difference in buffer width from 0 – 8 feet, depending on the slope of the surrounding terrain. The current S&G calls for a buffer width of 50 feet plus 2 feet for every 1

percent of slope. The revised S&G calls for a buffer width of 50 feet plus 4 feet for every 1 **degree** of slope. The calculated buffer width is identical at a 0 degree slope and at a 90° slope. The maximum difference occurs at a 22° slope (which is the same as a 40% slope). The new S&G results in a buffer width of 138 feet, as opposed to the previous width of 130 feet. This minor difference in buffer width could have a slight effect on the placement of new roads. At the programmatic level, this effect is negligible.

Monitoring requirements proposed in Alternatives 1 and 2 for the 13 percent subsection of the Allegheny River may identify potential impacts to water quality for Clubshell mussel and Northern Riffleshell mussel. In the event these impacts originate from roads, road management or maintenance could be affected on a limited basis. Detection of substandard conditions would occur earlier in Alternatives 1 and 2 than in Alternative 3.

Powerline Rights-of-Way

In summary, the S&G's proposed in Alternatives 1 and 2 are expected to produce no significant impacts on electric utility rights-of-way management. The ANF EIS for Vegetation Management on Electric Utility Rights-of-way (USDA-FS, 1997a) still accurately describes effects for the current situation (Alternative 3). There are no known abandoned or active Bald eagle nesting trees adjacent to powerline rights-of-way. Under Alternatives 1, 2, or 3, if an eagle were to build a nest near an electric R/W and maintenance activities were necessary on the R/W, the FWS would be contacted to determine appropriate timing and mitigation for the required activity. The FWS would be similarly contacted in the event an Indiana bat roost tree posed a threat to safe and reliable electric transmission on a right-of-way. In Alternative 3 no new S&G's would be added to the Forest Plan. The effects of implementing Alternative 3 would be similar to those found in Alternatives 1 and 2.

Water Quality

In summary, the S&G's proposed in Alternatives 1 and 2 would result in no direct or indirect changes to water quality above those already described in the current Forest Plan FEIS (pp. 4-20, 34, 35, 50, 58, 59, 78-82). In Alternative 3, S&G's designed to minimize the risk of introduction of Zebra mussels are not implemented. As a result, it is possible that there could be an indirect effect on water quality. Infestations of Zebra mussel in the Allegheny Reservoir could affect water clarity and alter the chemical make-up of water. It is unclear what affect Zebra mussels would on water quality in the Allegheny River

S&G's 1-12

In Alternatives 1 and 2, S&G's 1 through 12 are designed to protect or provide specific types of trees important to these species, not to enhance or to maintain a specific level of water quality. In the case of Bald eagles, the S&G's also serve to limit disturbance or management activity within a specified distance from existing, potential, or abandoned nests, but again they are not designed to have any impact on water quality. Consequently, we expect to see no difference in water quality between Alternatives 1 and 2 and Alternative 3 as a result of implementing S&G's 1 through 12. The Forest Plan FEIS discussion applies equally to all alternatives.

S&G's 14-15

The implementation of procedures in Alternative 1 to prevent Zebra mussel introduction and Alternative 2 that closes ANF boat launches would not change direct or indirect effects on water quality discussed in the Forest Plan FEIS. In Alternative 3, it is possible that indirect effects to water quality could occur if Zebra mussels become established. There is limited information available on impacts to river systems. It is possible that as Zebra mussels begin filtering water, an increase in water clarity could occur as a result of the removal of algae and other microscopic sized organic particles. This may not be as evident in the river as it would be in the reservoir, and depends on the level of infestation. This could decrease the amount of "food" available for native mussels and fish. Indirectly, native mussels could be affected if darters, the host fish for immature native mussels, were reduced in numbers because of a reduction in a food source.

FWS personnel evaluated existing Forest Plan S&G's during this analysis and concluded that existing S&G's in the Forest Plan (Alternative 3) adequately protect water quality (habitat) for Clubshell mussel and Northern Riffleshell mussel with one exception. In Alternatives 1 and 2, proposed S&G 15 modifies an existing S&G to bring it into compliance with Best Management Practices (BMP), as outlined by the State of Pennsylvania. Proposed S&G 15 in Alternatives 1 and 2 results in a change in the way buffer zone widths are calculated. This change brings the Forest Plan in agreement with the BMP's outlined by the State of PA. The change in calculation results in a difference in buffer width from 0 – 8 feet, depending on the slope of the surrounding terrain. This minor difference in buffer width is not anticipated to have any effect on water quality – the change is being made to bring Forest Plan S&G's consistent with the State. The BMP S&G would not be changed in Alternative 3 therefore no effects to the Forest Plan water quality standards would occur.

There are monitoring requirements (Chapter 2) proposed in Alternatives 1 and 2 that would evaluate potential impacts to water quality (habitat) for Clubshell mussel and Northern Riffleshell mussel. This information would identify water quality problems in tributaries within the 13 percent subsection of the Allegheny River, should any arise. These monitoring requirements would permit earlier detection and correction of any subsequently identified water quality problems than would occur in Alternative 3. There are currently no water quality monitoring requirements in the Forest Plan.

Oil, Gas, and Minerals

In summary, there are minimal impacts to oil, gas, and mineral development activities on the ANF as a result of S&G's proposed in Alternatives 1 and 2. The changes that would occur are quite minor and/or localized in nature, and when considered at the programmatic level, result in little change to effects previously discussed in the Final Environmental Impact Statement (FEIS) prepared for the Forest Plan (FEIS, pp. 4-47 through 4-57). . In Alternative 3 no new S&G's would be added to the Forest Plan; therefore, no effects to oil and gas operations would occur. Oil, gas and minerals would continue to operate under current direction.

Federal Oil, Gas, and Minerals

Since no Federal oil and gas development is anticipated during this planning period there would be no effect on Federal minerals from implementing Alternatives 1, 2, or 3.

Private Oil, Gas, and Minerals

ANF personnel work cooperatively with private mineral owners to emphasize environmentally responsible implementation of their subsurface ownership rights in areas where the surface of the land is in Federal ownership. Significant effects will continue to be mitigated through this educational and cooperative approach that maximizes financial benefits to both parties and minimizes environmental effects (Forest Plan FEIS, pp. 1-16 and 17).

Activities necessary to implement private oil and gas development include clearing of vegetation from rights-of-way and well sites, construction of roads/well sites/support facilities, installing the wells and collecting products from them, and disposal of produced fluids (Forest Plan FEIS, p. 4-47).

Oil, gas, and mineral owners/developers are responsible for complying with applicable State and Federal laws and regulations (Forest Plan, p. 4-46).

The effects of implementing S&G's 1 – 15 on private OGM development could result in minor localized adjustments to development plans if private mineral owners voluntarily comply with suggested guidelines. These changes could include minor modifications to site plans or road locations if specialized habitats for T&E species are in close proximity to the OGM site. In Alternative 3, there would be no change from current practice. In all cases, the private mineral owner bears the responsibility of compliance with applicable State and Federal laws and regulations.

BIOLOGICAL CHARACTERISTICS

Vegetation

The following discussion evaluates how proposed changes or additions to Forest Plan S&G's affect specific pertinent characteristics of the vegetation resource. It also summarizes how Forest Plan approved vegetative activities are affected. Firewood and Insect Defoliation will not be discussed as separate elements since there are no effects on or from these activities. Discussion about mussels is only included for those elements of vegetation that influence mussel habitat and survival.

Forest Type and Age Class Distribution

The following discussion applies to both the 13 percent subsection and the ANF, unless otherwise noted.

Forest Type - In summary, S&G's 1 through 15 proposed in Alternatives 1 and 2 would result in no changes in forest type from what would occur in Alternative 3.

Forest type distribution, whether as a result of natural processes or management actions, is not affected. The requirements to retain super-canopy trees, white pine, and varying numbers of live trees would not alter species composition to any great extent or change forest types for individual stands. The requirement to leave certain numbers of dead trees has no effect on forest types (only live trees are considered when assigning a forest type to a stand). Consequently, there are no changes to effects on forest type as discussed in the Forest Plan FEIS (Forest Plan FEIS, pp. 4-15 through 30) as a result of proposed S&G changes in Alternatives 1 and 2. In Alternative 3 no new S&G's would be added to the Forest Plan therefore no effects to forest type would occur.

Age class distribution is not affected by S&G's 1 through 15 as proposed in Alternatives 1 and 2, and would result in no change in age class distribution from what would occur in Alternative 3. At the programmatic level, these S&G's do not limit final harvest activity.

S&G 1 proposed in Alternatives 1 and 2 modifies existing requirements for buffer zones surrounding Bald eagle nests (both active and inactive). All timber harvest would be prohibited within a 660-foot buffer zone of active nests and nests that are abandoned for less than 3 years. This S&G could result in the need to modify a stand boundary or to defer timber harvest in order to protect a nest. Existing S&G's (Alternative 3) already call for a similar kind of buffer zone to protect Bald eagle nests. The new S&G is proposed to clarify existing direction and constitutes a minor change from the current situation, Alternative 3. In addition, the places where Bald eagles are known to nest and are most likely to nest (side slopes surrounding the Allegheny Reservoir, Allegheny River, Tionesta Creek, Clarion River, Kinzua Creek, and Salmon Creek) are in areas of the ANF where limited amounts of tree cutting occur. In the event new nests were found in areas where regeneration harvest is planned, the modification of an individual stand boundary or deferring a few stands from harvest for a period of time would have a insignificant impact on timber harvest activity or harvest volume amounts on the ANF. Deferring harvesting near nests could affect final harvest activity in the unlikely event that active nests, potential nests, and abandoned nests become much more abundant and widespread throughout the ANF than anticipated.

S&G 5 proposed in Alternatives 1 and 2 requires that activities within 1,320 feet of roosting areas be restricted to minimize the risk of incidental take of roosting eagles. This S&G could result in similar impacts as those described above for S&G 1.

S&G's 2 through 11 and 15 proposed in Alternatives 1 and 2 would not affect final harvest activity levels at the programmatic level. They do not propose deferring any final harvest activity.

Proposed S&G 12 in Alternatives 1 and 2 requires that individual Indiana bat roost trees be protected until such time that they no longer serve as a roost tree. Protection of individual trees can occur with no effect on the Alternative 3 programmatic implementation of even-age regeneration harvest.

Consequently, the proposed S&G changes in Alternatives 1 and 2 do not create a need to change the age class distribution effects discussed in the Forest Plan FEIS (pp. 4-15 through 30 and 4-94), i.e., Alternative 3. The effects of implementing Alternative 3 are the same as those in Alternatives 1 and 2, no affect on age-class distributions.

Forest Vegetation and Habitat for Threatened and Endangered Species

In summary, some difference in forest vegetation could occur as a result of implementation of S&G's proposed in Alternatives 1 and 2 from what would occur in Alternative 3. While the intent of proposed S&G's is to minimize take of T&S species, there are also differences in habitat that will result from Alternatives 1 and 2. There could be minor differences in habitat for Bald eagle, and no change to habitat for Clubshell mussel or Northern Riffleshell mussel under any alternative. In Alternatives 1 and 2, effects could be anticipated with respect to the distribution of live and dead trees. As individual stands are harvested, and live and dead tree requirements are met, the overall average condition for the distribution of live and dead trees could be expected to increase above that found in Alternative 3 (with the exception of 9" dbh [diameter at breast height] live trees which is already at 100% distribution). The increases are expected to be minor, however. In Alternative 3 no new S&G's would be added to the Forest Plan therefore no new effects to the T&E species would occur above and beyond those discussed in the Forest Plan FEIS.

S&G's 1-5

Proposed S&G's 1 through 5 included in Alternatives 1 and 2 provide more specific direction for Bald eagle habitat with respect to nest trees (which helps provide potential nest trees and helps protect existing and abandoned nest trees) and roosting areas than what is provided in Alternative 3. Though no timber harvest activity is planned in Alternatives 1, 2, and 3 for those areas where Bald eagles currently nest, and very little would be planned for areas where they are most likely to nest, adopting S&G's 1 through 5 results in the protection of habitat. Alternatives 1, 2, and 3 are expected to have an equal abundance of nest trees, forest cover, and perches near the water's edge in the river/creek corridors where Bald eagles are known to nest, forage and roost.

S&G's 6-12

S&G's 6-12 have the potential to impact the distribution of habitat for Indiana bat

Roost Habitat - Size Class Distribution of Live and Dead Trees

Chapter 3 discussion on this topic shows that current (Alternative 3) live and dead tree roosting habitat for the Indiana bat is very abundant. Given current knowledge of species' needs, there appears to be abundant roosting habitat to support species recovery. Nevertheless, current S&G's, though not specifically designed for Indiana bat, would ensure suitable roosting habitat remains following harvest treatments, though the acres harvested annually (less than 3%) is a relatively small portion of the ANF. The vast majority (~75%) of the area outside treatments areas would still provide optimal habitat.

Alternatives 1 and 2 provide identical new standards for Indiana bat roosting habitat. S&G's 7 through 11 ensure suitable roosting habitat will remain following final harvests and optimal roosting habitat following partial harvests. S&G 9 provides guidance on priorities to use when selecting tree species to leave as roost trees, and S&G 10 specifies that some live trees left should be located to provide shade for one-third of the roosting snag trees left. These standards help ensure that roosting habitat conditions following thinnings are optimal as opposed to the suitable habitat that results from Alternative 3 (Romme *et al.,* 1995). Though roosting habitat conditions would generally be suitable following final harvest in Alternatives 1, 2, and 3, the more specific guidelines in Alternatives 1 and 2 would no doubt help move them closer to optimal than would the guidelines in Alternative 3.

Summer Roost Habitat Canopy Closure

In Alternatives 1 and 2, S&G 11 requires that canopy closures after partial timber harvest such as thinnings and shelterwood seed cuts, remain greater than 50 percent. In practice, current silvicultural guidelines for these kinds of harvests generally result in canopy closures above 60 percent, although in some instances, partial harvests could reduce canopy closure below 54 percent (For more information, see the harvest activity discussion in the next section). Therefore, this S&G generally will not result in change from what occurs currently in Alternative 3.

Foraging Habitat Canopy Closure

In Alternatives 1 and 2, S&G 11 requires that canopy closures after partial timber harvest such as thinnings and shelterwood seed cuts, remain greater than 50 percent. In practice, current silvicultural guidelines for these kinds of harvests generally result in canopy closures above 60 percent, although in some instances, partial harvests could reduce canopy closure below 50 percent (For more information, see the harvest activity discussion in the next section). Therefore, this S&G generally will not result in change from what occurs currently in Alternative 3.

S&G's 14-15

In Alternatives 1, 2, and 3, forest vegetation within the 13 percent subsection is expected to equally continue to protect habitat, particularly water quality, for these mussels. Proposed S&G 15 in Alternatives 1 and 2 results in a change in the way buffer zone widths are calculated. This change brings the Forest Plan in agreement with the Best Management Practices outlined by the State of PA. The change in calculation results in a difference in buffer width from 0 – 8 feet, depending on the slope of the surrounding terrain. This minor difference in buffer width could result in a modification of cutting unit boundaries at the site-specific level. At the programmatic level, there would be no change forest vegetation that provides habitat for T&E species.

There are monitoring requirements proposed in Alternatives 1 and 2 that would evaluate potential impacts to water quality (habitat) for Clubshell mussel and Northern Riffleshell mussel. This information could identify water quality problems in tributaries within the 13 percent subsection of the Allegheny River, should any arise. These monitoring requirements should permit earlier detection and correction of any subsequently identified water quality problems that may relate to forest cover changes than would occur in Alternative 3, which includes no such requirements.

ANF Harvest Treatments and Harvest Volumes

In summary, compared with the current situation, there are negligible impacts to harvest treatments and perhaps minor impacts on harvest volumes as a result of S&G's proposed in Alternatives 1 and 2. When considered at the programmatic level, there is virtually no change to effects previously discussed in the Forest Plan FEIS (pp. 4-15 through 4-30 and 4-43). These S&G's are not included in Alternative 3 therefore the alternative would not have an effect on harvest treatments and volumes.

S&G's 1-5

Proposed S&G's 1 through 5 included in Alternatives 1 and 2 modify existing requirements for buffer zones surrounding Bald eagle nests (both active and inactive), identify individual trees to be retained for future habitat needs, and provide protection for roosting areas. Timber harvest would be prohibited within a 660-foot buffer zone of active nests and nests that have been abandoned for less than 3 years. These S&G's could result in the need to modify a harvest unit boundary, or to exclude areas up to 31 acres in size from harvest activity.

Alternative 3 includes existing Forest Plan S&G's that protect Bald eagle nest locations by establishing a 330-foot buffer where no disturbance would occur, a 660-foot buffer where no significant landscape changes

would occur, and S&G's that protect nesting birds by establishing a 1,320 foot buffer where no timber harvest would occur from February 1 to July 31.

The S&G's included in Alternatives 1 and 2 are more restrictive within 660 feet of a nest than they are in Alternative 3. In the event new nests or roosting habitat are found in areas where regeneration harvest is planned, the modification of an individual stand boundary or deferring a few stands from harvest for a period of time would have a insignificant impact on ANF (programmatic level) timber harvest activity or harvest volume amounts. Deferring harvesting near nests could affect harvest activity in the unlikely event that active nests, potential nests, and abandoned nests become much more abundant and widespread throughout the ANF than anticipated

S&G's 6-12

Proposed S&G's 6 through 10 included in Alternatives 1 and 2 modify requirements for retaining dead and live trees following different kinds of timber harvests. Existing S&G's place similar requirements in all harvest areas. The primary difference between the existing and proposed S&G's is that proposed S&G's establish diameter requirements for dead and live trees that are to be retained in harvest areas. The diameter requirements are not found in existing S&G's. Proposed S&G 12 establishes the requirement to protect roost trees. If a roost tree is found near or within a stand proposed for harvest; additional consultation with FWS would be needed to determine appropriate means of protection.

Proposed S&G 11 in Alternatives 1 and 2 stipulates that post-harvest canopy closures in partial and intermediate harvest areas will not drop below 50 percent. Based on survey results presented in chapter 3, on average, the post-harvest condition for these kinds of harvests falls within this specified range. It is anticipated that the post-harvest condition in areas being treated for purposes of adaptive management, and specifically two-age and modified shelterwood seed harvests, could result in canopy closures less than 50 percent. Projects where adaptive management treatments are expected to fall below 50 percent canopy closure will require additional contact with FWS personnel to determine how to proceed.

These changes included in Alternatives 1 and 2 do not restrict where or how much timber harvest activity may occur. They may have a minor impact on harvest volumes in a single project. In many harvest areas there would be no impact because we would leave the same number and sizes of trees regardless of the alternative. Only their location within the unit would change. Effects could be larger in salvage areas from the effect of leaving healthy live trees, particularly if they are high value species. Due to defoliating insect food preferences and inherent site characteristics, on some sites only the Black cherry has healthy crown conditions (though by nature, cherry crowns are small and are not the best shade producers). Monitoring will help quantify changes to harvest volumes and values, but overall we expect the effect on volume to be relatively small. The effect on values is relatively minor as well depending upon how many high value trees must be left (see economics discussion, p. 4-89 and 4-90). These S&G's are not included in Alternative 3 therefore there would be no change from the current condition in the amount or kind of trees that are remaining after harvest activities.

Proposed S&G 12 establishes the requirement in Alternatives 1 and 2 to protect roost trees. It is conceivable that a roost tree could be discovered within a stand scheduled for timber harvest. In the event of this occurrence, further consultation with FWS would be needed to determine the appropriate course of action. The discovery of a maternity roost tree would likely have impacts to the selection of stands that would be selected for timber harvest. The specific changes would be determined following consultation with FWS.

S&G's 14-15

In Alternatives 1, 2, and 3, existing S&G's for harvest activity within the 13 percent subsection are expected to continue to protect habitat, particularly water quality, for the endangered mussels. Proposed S&G 15 in Alternatives 1 and 2 results in a change in the way buffer zone widths are calculated. This change brings the Forest Plan in agreement with the Best Management Practices outlined by the State of PA. The change in calculation results in a difference in buffer width from 0 – 8 feet, depending on the slope of the surrounding

terrain. This is a negligible change from what is currently stated in the Forest Plan and could result in insignificant differences in stand boundary delineation. At the programmatic level, there would be no change in harvest treatments or harvest volumes. In Alternative 3 no new S&G's would be added to the Forest Plan. There would be no effects on timber volumes or treatments as no change to buffer widths occurs.

There are monitoring requirements (Chapter 2) proposed in Alternatives 1 and 2 that would evaluate potential impacts to water quality (habitat) for Clubshell mussel and Northern Riffleshell mussel. This information would identify water quality problems in tributaries within the 13 percent subsection of the Allegheny River, including any which may result from harvesting activity. Harvest activity would only occur on a limited basis on ANF lands within the 13 percent subsection, because over 60 percent of ANF land is designated to Management Areas where only minor amounts or no timber harvest occurs.

Reforestation

In summary, there are negligible impacts to current reforestation practices resulting from new S&G's proposed in Alternatives 1 and 2. Reforestation success, for the most part, would not change, although some concerns exist about the effects from leaving larger trees, particularly on shade intolerant species. However, when considered at the programmatic level, there is virtually no change to effects previously discussed in the Forest Plan FEIS (pp. 4-37 through 42) or in the amendment which addresses understory vegetation management (USDA-FS, 1991, pp. 4-1 through 4-25). Future monitoring of reforestation treatments will determine whether or not changes in reforestation success occur as a result of changes in residual tree requirements. Alternative 3 did not change any of the S&G's. Reforestation practices would continue as described in the Forest Plan FEIS.

S&G's 1-5

In Alternatives 1 and 2, proposed S&G's 1 through 5 modify existing requirements for buffer zones surrounding Bald eagle nests (both active and inactive), identify individual trees to be retained for future habitat needs, and protect roosting areas.

Reforestation activities, though not specifically mentioned in S&G's 1 through 5, are consistent with the types of activities described as "necessary to prohibit" within a 660-foot buffer zone of active nests and nests that are abandoned for less than 3 years. The discussion in the "ANF Harvest Treatment" subsection (Chapter 4) also applies to reforestation activity. As a general rule, if final harvest or selection harvest is deferred near a nest, reforestation activity would also be deferred. Reforestation activity outside these buffers would not be affected by S&G's 1 through 5. In the unlikely event heavy tree mortality occurs near a nest site or a roosting site, it may be necessary to give special consideration to implementing some type of reforestation activity there in order to maintain continuous forest cover. This could require further consultation with FWS.

S&G's 6-12

In Alternatives 1 and 2, proposed S&G's 6 through 10 modify requirements for retaining dead and live trees following different kinds of timber harvests. Reforestation treatments typically occur in combination with regeneration harvest methods such as shelterwoods, two-age, group selection, or individual tree selection. The proposed S&G's modify existing S&G's by establishing diameter requirements for dead and live trees that are to be retained in harvest areas. The diameter requirements are not found in existing S&G's. The reforestation treatment is not likely to be limited by these changes, unless safety considerations (due to the presence of larger residual trees) limit the use of certain kinds of treatment or equipment.

Proposed S&G 11 in Alternatives 1 and 2 stipulates that post-harvest canopy closures in partial and intermediate harvest areas will not drop below 50 percent. Modified shelterwood seed harvests, selection harvests and two-age harvests prescribed under adaptive management could result in canopy closures that fall below this level. Reduced stocking levels (and, therefore, reduced canopy closure) are prescribed for the specific purpose of determining whether doing so increases seedling response. Further consultation with the

FWS would be required for projects where these kinds of treatments are proposed. These changes included in Alternatives 1 and 2, as a general rule, would not negatively affect reforestation success (from that observed in Alternative 3). In many harvest areas there would be no impact because we would leave the same number and sizes of trees regardless of the alternative. If the residual trees provide too much shade on some sites, particularly for shade intolerant species, then stem quality, density, and tree form could be adversely affected. Monitoring will help determine whether reforestation success and stem quality are impacted, but overall we expect the effect to be relatively small.

Proposed S&G 12 establishes the requirement in Alternatives 1 and 2 to protect roost trees. It is conceivable that a roost tree could be discovered within a stand scheduled to receive a reforestation treatment. In the event of this occurrence, further consultation with FWS would be needed to determine the appropriate course of action. The discovery of a maternity roost tree would likely have impacts to the selection of stands that would be included in reforestation activities. The specific changes would be determined following consultation with FWS.

S&G's 14-15

In Alternatives 1, 2, and 3, existing S&G's for reforestation activity within the 13 percent subsection are expected to continue to protect habitat, particularly water quality, for these mussels. Proposed S&G 15 in Alternatives 1 and 2 results in a change in the way buffer zone widths are calculated. This change brings the Forest Plan in agreement with the Best Management Practices outlined by the State of PA. The change in calculation results in a difference in buffer width from 0 – 8 feet, depending on the slope of the surrounding terrain. This is a negligible change from what is currently stated in the Forest Plan and could result in insignificant differences in stand boundary delineation. At the programmatic level, there would be no change in reforestation opportunity or reforestation success.

Monitoring proposed in Alternatives 1 and 2 (Chapter 2) would evaluate potential impacts to water quality (habitat) for Clubshell mussel and Northern Riffleshell mussel. In a similar fashion, these monitoring requirements would permit earlier detection and correction of any subsequent water quality problems (in this case arising from reforestation practices) that may develop than would occur in Alternative 3, which includes no such requirements.

Wildlife Habitat

Composition and Structure of Communities

Broad community types have been identified on the ANF (p. 53). The following subsection discusses effects by alternative on Conifer and Riparian. Effects on the remaining community types will be discussed in the "Management Indicator Species" subsection (p. 61*).*

Conifer & Riparian

S&G's 1-5

Alternatives 1 and 2 contain S&G's 1 through 5 which are designed to protect adequate numbers of super-canopy white pine and other large trees for Bald eagle nesting and roosting in areas where eagles are likely to nest and roost. They would be protected in both of these community types in areas where eagles are nesting/roosting or at other appropriate locations on the ANF. This would have a relatively minor impact on the conifer or riparian community type structure, compared to the structure that would be achieved under guidance in the Forest Plan, because the Forest Plan calls for little harvesting in these portions of the ANF.

S&G's 6-12

Proposed S&G's 6 through 11 included in Alternatives 1 and 2 modify requirements for retaining dead and live trees following different kinds of timber harvests and for retaining 50 percent minimum canopy closure

following partial harvests. Existing S&G's in Alternative 3 place similar tree retention requirements in harvest areas. The primary difference between the existing and proposed S&G's related to retaining dead and live trees is that proposed S&G's establish minimum diameter requirements for dead and live trees that are to be retained in harvest areas. The current Forest Plan also does not mention the canopy closure minimum, but that minimum is close to but not exactly the same as current silvicultural standards. It is anticipated that S&G's 6 through 12 would have negligible impact on conifer and riparian community types as limited amounts of timber harvest occurs in these areas and existing S&G's already specify similar residual tree requirements.

In Alternatives 1 and 2, proposed S&G 12 establishes the requirement to protect roost trees. It is conceivable that a roost tree could be discovered within either of these communities; the roost tree would be protected, but there would be a negligible effect on these community types.

S&G's 14-15

The implementation of Alternative 1 or Alternative 2 would not impact conifer or riparian community types beyond what is already discussed in the Forest Plan FEIS (pp. 4-45, 47, 51, 87-99). Likewise, the implementation of Alternative 3 would not affect conifer or riparian community types beyond what is already discussed in the Forest Plan.

Management Indicator Species

In summary, compared with the current situation, there may be minor impacts to habitat for several management indicator species (pileated woodpecker, red-shouldered hawk, barred owl, and yellow-bellied sapsucker) as a result of S&G's proposed in Alternatives 1 and 2. Habitat for other management indicator species discussed in Chapter 3 would not be affected. When considered at the programmatic level, there is virtually no change to effects previously discussed in the FEIS (FEIS, pp. 99 through 103). Alternative 3 could have minor effects to walleye and smallmouth bass in the reservoir and river.

Forest Service planning regulations (36CFR 219.19) require that viable populations of native and desired non-native species be maintained. The "likelihood of persistence" is one method of assessing viability (Committee of Scientists Report, 1999). Under the current Forest Plan direction (Alternative 3) all Management Indicator Species except for the rattlesnake were determined to have a high likelihood of persistence (Fish and Wildlife MIS Monitoring Report, March 2000). Timber rattlesnakes have a moderate likelihood of persistence. The likelihood of persistence for all sensitive species would not change under any alternative.

S&G's 1-5

Proposed S&G's 1 through 5 included in Alternatives 1 and 2 modify existing requirements for buffer zones surrounding Bald eagle nests (both active and inactive), identify individual trees to be retained for future habitat needs, and provide protection for roost areas. There are no impacts anticipated to other MIS as a result of the proposed S&G's.

S&G's 6-12

Proposed S&G's 6 through 11 included in Alternatives 1 and 2 modify requirements for retaining dead and live trees following different kinds of timber harvests. Existing S&G's in Alternative 3 place similar requirements in all harvest areas. The primary difference between the existing and proposed S&G's is that proposed S&G's establish diameter requirements for dead and live trees that are to be retained in harvest areas. The diameter requirements are not found in existing S&G's. Proposed S&G 12 establishes the requirement to protect roost trees. The proposed S&G's would result in habitat that could benefit species that utilize larger diameter dead trees for roost or nest purposes. Species that could potentially benefit from larger diameter trees being retained are pileated woodpecker, yellow-bellied sapsucker, red-shouldered hawk,

and barred owl. There are no impacts anticipated to other MIS as a result of the proposed S&G's for the Indiana Bat.

S&G's 14-15

In Alternative 1, S&G 14 requires that screening and decontamination procedures be implemented at Forest Service boat launch facilities on the Allegheny Reservoir and Allegheny River in order to reduce the risk of Zebra mussel introduction from Forest Service facilities in these waters. In Alternative 2, S&G 14 closes these facilities, thereby eliminating the risk of Zebra mussel introduction from Forest Service facilities in these waters. In both cases, risk of Zebra mussel introduction remains as no change in procedures would occur at the numerous private and other public boat launches. So while risk of introduction is reduced by actions taken at Forest Service boat launches, risk remains because preventative actions are not taken at all launches that access the Allegheny Reservoir and Allegheny River. In Alternative 3, implementation of measures to prevent the introduction of Zebra mussel does not occur. If Zebra mussels were to become established in these waters, there is a chance that some effect to smallmouth bass could result,

Monitoring requirements proposed in Alternatives 1 and 2 would evaluate potential indirect impacts from ANF activities (i.e., roads and trails) to the habitat of Clubshell mussel and Northern Riffleshell mussel. The monitoring would occur within the 13 percent subsection (un-impounded section) of the Allegheny River, and the information collected would also be useful for evaluating brook trout habitat in headwater streams, and for walleye and smallmouth bass habitat in the Allegheny River. Alternative 3 includes no monitoring requirements; therefore, water quality problems could go undetected.

Federally Proposed, Endangered, or Threatened Species and Regionally Sensitive Species

Habitat for federally proposed, endangered, and sensitive species is discussed under the vegetation section. Impacts to federally endangered mussels are primarily associated with the potential for zebra mussels entering the upper Allegheny River watershed and are addressed under Clubshell and Northern Riffleshell below.

The discussion on sensitive species that follows will pertain to the Northern long-eared bat for proposed standards and guidelines that affect terrestrial habitats and to the aquatic fauna (1 mussel, 9 dragonflies and 7 fish) for actions associated with aquatic and riparian habitats. Other sensitive species included in Table 22 on page 65 and are not impacted by the proposed action. A detailed analysis of effects is contained in Appendix D.

S&G's 1-5

Proposed S&G's 1 through 5 included in Alternatives 1 and 2 modify existing requirements for buffer zones surrounding Bald eagle nests (both active and inactive), identify types of individual trees to be retained for future habitat needs, and provide protection for roost areas. These S&G's would result in no change in habitat for the Northern long-eared bat.

Alternative 3 includes existing Forest Plan S&G's that protect Bald eagle nest locations by establishing a 330-foot buffer where no disturbance would occur, a 660-foot buffer where no significant landscape changes would occur, and S&G's that protect nesting birds by establishing a 1,320-foot buffer where no disturbance from management activities would occur from February 1 through July 31.

Neither the proposed nor existing S&G's are expected to have any effect on the Northern long-eared bat.

S&G's 6-12

Proposed S&G's 6 through 10 included in Alternatives 1 and 2 modify requirements for retaining dead and live trees following different kinds of timber harvests. Existing S&G's in Alternative 3 place similar requirements in all harvest areas. These S&G's assure that minimum numbers of dead and live trees will be

found following timber harvest. Incidental take is minimized, and habitat is maintained. Proposed S&G 11 establishes the requirement to maintain at least 50% canopy closure in partial harvest units. There is no comparable requirement in Alternative 3, however in practice, application of silvicultural guidelines generally results in stands that are above 50% canopy closure. This S&G assures that either optimal foraging or roost habitat will be found following timber harvest. The primary difference between the existing and proposed S&G's is that proposed S&G's establish diameter requirements for dead and live trees that are to be retained in harvest areas. The diameter requirements are not found in existing S&G's. Proposed S&G 12 establishes the requirement to protect Indiana bat roost trees.

Comparable improvements in habitat for Northern long-eared bat could occur as a result of implementing proposed S&G's 8 through 12. Larger roost trees would be provided following timber harvests.

S&G's 14-15

In Alternative 1, S&G 14 requires that screening and decontamination procedures be implemented at Forest Service boat launch facilities on the Allegheny Reservoir and Allegheny River in order to reduce the risk of Zebra mussel introduction from Forest Service facilities in these waters. In Alternative 2, S&G 14 closes these facilities, thereby eliminating the risk of Zebra mussel introduction from Forest Service facilities in these waters. In both cases, risk of Zebra mussel introduction is not reduced for the numerous private and other public boat launches. So while risk of introduction is reduced by actions taken at Forest Service boat launches, risk remains because preventative actions may not be taken at all launches that access the Allegheny Reservoir and Allegheny River. In Alternative 3, implementation of measures to prevent the introduction of Zebra mussel does not occur. In Alternatives 1 and 2, risk of infestation on the Allegheny River system is reduced due to actions taken at Forest Service launch sites.

Alternative 3 does not require signing, decontamination of boats, or boat launch closures. This alternative has the highest potential for allowing the introduction of Zebra mussels into the reservoir and river from ANF boat launches. Thus, any effects to the sensitive fish species, sensitive dragonflies, or the Long-solid mussel are greatest in this alternative. However, it is not clear what those effects would be. A literature search could not locate any information describing the effects to small bottom-dwelling fish in a river system from Zebra mussel colonization. One possible effect is that if zebra mussels become heavily infested, spawning habitat could be altered to the detriment of the sensitive fish species. And as stated earlier, a decrease in food availability to the sensitive fish species could lead to an alteration of the population. Should these effects occur, it is still not likely to cause a trend toward federal listing since these fish species are widely distributed outside of Pennsylvania.

There is limited information on effects to macroinvertebrates (i.e., aquatic insects), a primary food source of the sensitive fish species, including a study on the St. Lawrence River (Ricciardi *et al.,* 1996a). The study showed that dense Zebra mussel colonies restructure macroinvertebrate communities on hard substrates by enhancing populations of deposit feeders, small scrapers, and predators, and by reducing or displacing populations of large filter-feeding organisms. So, it is unclear that if Zebra mussels do colonize the river in heavy enough concentrations and restructure the macroinvertebrate community, what effects (positive or negative) there may be on the sensitive aquatic fauna. The potential Zebra mussel colonization of the Allegheny River under all alternatives would not impact the Northern long-eared bat and would not likely cause a trend toward federal listing for any of the sensitive aquatic fauna.

Monitoring requirements proposed in Alternatives 1 and 2 would evaluate potential indirect impacts from ANF activities (i.e., roads and trails) to the habitat of Clubshell mussel and Northern Riffleshell mussel. The monitoring would occur within the 13 percent subsection (un-impounded section) of the Allegheny River, and the information collected would also be useful for correcting or mitigating potential negative effects to the sensitive aquatic fauna in the river. Alternative 3 includes no such requirements; therefore, water quality problems could go undetected.

Aquatic Resources

In summary, S&G's 1 through 13 included in Alternatives 1 and 2 would have a negligible effect on aquatic resources beyond those effects already described in the current Forest Plan (FEIS, pp. 4-20, 34, 35, 50, 58, 59, 78-82), i.e., Alternative 3. Alternatives 1 and 2 provide different techniques designed to help prevent Zebra mussels from colonizing the Allegheny River and Allegheny Reservoir from ANF boat launches. They both significantly reduce the risk of colonization due to introduction from Forest Service sites from that inherent in Alternative 3, which employs no such techniques.

Under Alternative 1, the implementation of S&G 14 could reduce the potential negative impact to the two endangered mussels by preventing or minimizing the introduction of Zebra mussels at ANF boat launches. The rationale for a reduction in the potential negative cumulative effect is that should screening and decontamination procedures implemented at Forest Service boat launches succeed at keeping Zebra mussels out of the reservoir, a source of veligers close to the endangered mussels habitat would be prevented. The effects for Alternative 2 are similar to Alternative 1; however, since Forest Service boat launches will be closed, Zebra mussels will not become established in the reservoir or river as a result of boats launching from ANF sites. This will reduce potential impacts to the endangered mussels for the same reason given in Alternative 1. This alternative is not likely to jeopardize the continued existence of the Northern Riffleshell mussel.

For Alternative 3, without any restrictions on boats launching from ANF sites, the possibility of Zebra mussel introduction is greatest. Should Zebra mussels get introduced into the reservoir, an immediate source of veligers would be present that could get flushed into the river and populate suitable sites. These suitable sites would likely include habitat currently occupied by the Clubshell mussel and Northern Riffleshell mussel. This alternative resulted in a jeopardy determination by the FWS for the Northern Riffleshell mussel.

S&G's 1-12

In Alternatives 1 and 2, S&G's 1 through 12 are designed to protect or provide specific types of trees important to these species, not to have a specific impact on aquatic resources. In the case of Bald eagles, the S&G's also serve to limit disturbance or management activity within a specified distance from existing, potential, or abandoned nests, but again they are not designed to have any impact on aquatic resources. Consequently, we expect to see no difference in water quality between any alternatives a result of implementing S&G's 1 through 12. The Forest Plan FEIS discussion applies equally to all alternatives.

S&G's 14-15

Analysis of the potential impacts of the alternatives on aquatic resources focuses primarily on the potential for Zebra mussels to colonize the Allegheny Reservoir and the Allegheny River. As was discussed in Chapter 3 (p. 50), water quality conditions in the Allegheny River are suitable for at least moderate levels of Zebra mussel colonization. While water velocity sometimes does exceed 1.5 meters per second, these flows are not continuous throughout the year to prevent Zebra mussel colonization. S&G 14 in Alternative 1 calls for screening boats to look for Zebra mussel contamination, and Alternative 2 closes all boat launches on the ANF (S&G 14). In Alternative 3, all ANF boat launches remain open, and there would be no screening or decontamination of boats at Forest Service boat launches.

In Alternative 1, ANF personnel would take an active role by educating recreationists and by inspecting boats at ANF boat launches in an effort to prevent Zebra mussel introductions. Successful implementation would lower the risk for introducing Zebra mussels into downstream sections of the Allegheny River where they could impact the two native endangered mussels. Alternative 2 would provide the second lowest level of protection. All ANF boat launches would be completely closed, and although this eliminates these as potential sites for Zebra mussel introduction sites, use at other non-Forest Service facilities would increase, thus negating the positive impact of closing these boat launches. Alternative 3 has the highest potential for

Zebra mussel introduction into the Allegheny Reservoir and Allegheny River from ANF facilities. With no preventative measures to help minimize their introduction at ANF boat launches, there is a much higher potential for Zebra mussels to become established in the reservoir and the river. Once in the reservoir, this body of water essentially would become a "nursery" area from which veligers could be flushed downstream and colonize areas where water quality is suitable in the Allegheny River. If the infestation (attachment) becomes heavy enough on native mussels, (i.e., the mass of Zebra mussels becomes nearly equal to or greater than the mass of native mussels), then heavy mortality and even extirpation could occur (Ricciardi *et al.*, 1996). This results from Zebra mussels interfering with the normal activity (feeding, respiration, and locomotion) of native mussels.

Proposed S&G 15 in Alternatives 1 and 2 results in a change in the way buffer zone widths are calculated. This change brings the Forest Plan in agreement with the Best Management Practices outlined by the State of PA. The current S&G calls for a buffer width of 50 feet plus 2 feet for every 1 **percent** of slope. The revised S&G calls for a buffer width of 50 feet plus 4 feet for every 1 **degree** of slope. The calculated buffer width is identical at a 0° slope and at a 90° slope. The maximum difference occurs at a 22° slope (which is the same as a 40% slope). The new S&G results in a buffer width of 138 feet, as opposed to the previous width of 130 feet. This minor difference in buffer width could have a negligible effect on aquatic resources. At the programmatic level, this effect is negligible.

SOCIAL/ECONOMIC CHARACTERISTICS

For three social/economic resource elements, visual resources, heritage resources, and wild and scenic rivers, there are no differences in effects between any of the alternatives and no effects on these elements. There are no changes in the Management Plan for the Allegheny Wild and Scenic River as a result of any Alternative. The effects as discussed in the W&SR EIS are applicable to all Alternatives and remain unchanged by actions proposed here.

Recreation Resources

In summary, there are negligible impacts to recreation resources as a result of S&G's proposed in Alternatives 1 and 3. The changes that would occur are quite minor in nature, and when considered at the programmatic level, result in virtually no change to effects previously discussed in the Forest Plan FEIS (pp. 4-8 through 15, 23, 36, 44, 47, 53, 57, 60, 114-119), i.e., Alternative 3 in the current analysis. Alternative 2 results in considerable impact to recreation users as a result of S&G 14. ANF boat access facilities would no longer be open along the Allegheny Reservoir and Allegheny River. Significant reductions in total recreation visitor days (RVD's) could occur, as well as reductions in total recreation revenues.

Recreation Facilities

Allegheny Reservoir and Allegheny River Facilities

S&G's 1-12

There would be no effect to existing recreation facilities as a result of S&G's 1 through 12 proposed in Alternatives 1 and 2 as compared with Alternative 3 and as are discussed in the Forest Plan FEIS.

S&G's 14-15

In Alternative 1 (proposed S&G 14) and Alternative 3, recreation facilities remain unchanged. All recreation facilities remain open for use. In Alternative 1, screening procedures to identify boats contaminated with Zebra mussels will be implemented. Boats found to be contaminated would be restricted from access to the Allegheny Reservoir or Allegheny River from ANF launch sites until operators complied with approved decontamination procedures. There would be no change in procedures at ANF boat launch facilities in Alternative 3 (the current situation), and restrictions on use by boats contaminated with Zebra mussels would not occur.

In Alternative 2, proposed S&G 14 would result in closing all 10 ANF boat launches on the Allegheny Reservoir and Allegheny River. Parking areas and access roads to these facilities would remain open for other recreation activities such as scenic viewing, fishing, hunting or hiking. The Wolf Run Marina on the Allegheny Reservoir would be closed and the special use permit for site operation would be suspended. The special use permit for use of the Buckaloons boat launch by a canoe outfitter/guide would also be suspended. This action effectively eliminates the possibility of the introduction of Zebra mussel into the Allegheny River from ANF sites, but not from other sites. Three canoe launches located one each on the Tionesta Creek, Clarion River, and Beaver Meadows Lake would remain open. The risk of Zebra mussel introduction from these sites is considered to be extremely low, that closures or screenings are not required, and that educational signing is adequate for these three sites.

Alternative 2 results in a reduction in recreation use, most of which is centered around facilities that are found on the Allegheny Reservoir. Reductions in use could result in the need to consider reducing the number of facilities provided, especially the semi-primitive campgrounds that are accessed primarily by boat. While these sites are accessible to hikers, the vast majority of use occurs from boaters. Boaters launching from Onoville Marina or Highbanks boat launches in New York State would still use some of these campsites. Impacts in use are also anticipated to occur at the more highly developed recreation sites found along the reservoir. Much of the use that occurs at these facilities is from people who boat on the reservoir and choose to participate in other recreation activities.

Trails

In summary, there are negligible impacts to trail management and trail construction practices as a result of S&G's proposed in Alternatives 1 and 2. The changes that would occur are quite minor in nature, and when considered at the programmatic level, result in virtually no change to effects previously discussed in the Forest Plan FEIS (pp. 4-12 through 15 and 114-119). There would be no effects to trail management from Alternative 3 as no new S&G's are proposed.

S&G's 1-5

Alternatives 1 and 2 - Proposed S&G's 1 through 5 modify existing requirements for buffer zones surrounding Bald eagle nests (both active and inactive) and identify individual trees to be retained for future habitat needs. Trail management and construction would be prohibited within a 660-foot buffer zone of active nests and nests that are abandoned for less than 3 years. These S&G's could result in the need to either temporarily or permanently close an existing trail, or relocate an existing trail away from a nest. New trail construction would not occur within the buffer. The impact of these modified S&G's is expected to be negligible. Existing S&G's already call for similar kinds of buffer zones to protect Bald eagle nests.

The new S&G's for Alternatives 1 and 2 are proposed in order to clarify existing direction and constitute a minor change from the current situation. These standards provide more detail than what is currently contained within existing S&G's. Only three nests exist and large numbers of nests are not likely to occur. In the event new nests were found in areas where trail construction is planned, the relocation of an individual trail, at the programmatic level, would have an negligible impact.

S&G's 6-12

In Alternatives 1 and 2, proposed S&G's 6 through 10 modify existing (Alternative 3) requirements for retaining dead and live trees following different kinds of timber harvests. Trail management and trail construction would not be limited by these S&G's. Proposed S&G 12 establishes the requirement to protect maternity roost trees. It is conceivable that an occupied roost tree could be discovered within the clearing limits of a proposed trail location or nearby where it could present a safety hazard (in the case of a dead tree) to people who would use the trail. In the event this occurs, FWS would be contacted to determine the appropriate course of action. This is an insignificant change at the programmatic level. The Forest Plan FEIS discussion remains equally applicable to Alternatives 1 and 2.

S&G's 14-15

In Alternatives 1 and 3, all Forest Service boat ramps would remain open. In Alternative 2, proposed S&G 14 closes all Forest Service boat ramps on the Allegheny River and the Allegheny Reservoir. No change is anticipated in trail use, management or maintenance as a result of any alternative. Therefore, the Forest Plan FEIS discussion of effects on trail management Forest Plan FEIS applies equally to all alternatives. No changes in trail management are anticipated as a result of S&G 15.

Monitoring requirements proposed in Alternatives 1 and 2 for the 13 percent subsection of the Allegheny River may identify potential impacts to water quality for Clubshell mussel and Northern Riffleshell mussel. In the event these impacts originate from trails, trail management or maintenance could be affected on a limited basis. Detection of substandard conditions could occur sooner in Alternatives 1 and 2 than in Alternative 3. In all of the alternatives, existing substandard conditions (p. 58) already identified on five miles of trail would be corrected.

Recreation Use

In summary, the S&G's proposed in Alternative 1 would result in comparable recreation use and effects as described in the Forest Plan FEIS Chapter 4, i.e., Alternative 3 in the current analysis. Alternative 2 would result in considerable reductions in recreation use associated with the developed facilities found along the Allegheny Reservoir and Allegheny River. There are no changes in recreation use anticipated as a result of proposed S&G's 1 through 13, and 15 in Alternatives 1 and 2, therefore there will be no further discussion related to Bald eagle and Indiana bat. Only S&G 14 would impact recreation use.

S&G 14

In Alternatives 1 and 3, recreation use on ANF is expected to remain unchanged because all facilities and trails remain open for use. Screening procedures for Zebra mussels implemented in Alternative 1 could result in negligible reductions in use. Some boaters might choose to use other facilities where screening procedures and decontamination are not required. Effects on use, however, are still expected to be negligible. Education efforts to increase public understanding and awareness of the problems associated with Zebra mussel should be effective in developing voluntary public compliance with screening and decontamination requirements.

In Alternative 2, recreation use will be substantially reduced on the Allegheny Reservoir as a result of closing ANF boat launches, including the Wolf Run Marina. Suspension of a special use permit for use of the Buckaloons boat launch by a canoe outfitter/guide would also shift use to a nearby access point. The decrease in RVD's would be negligible. The direct effect of these closures would be the loss of all RVD's associated with boat and canoe use. An indirect effect would be additional reductions in RVD's from associated activities such as scenic viewing, camping, picnicking, swimming, and fishing. Some ANF recreationists could be displaced to facilities found in other nearby reservoirs in Pennsylvania and New York, as well as Lake Erie. Some would likely abandon their water-based recreation activities due to the inconvenience in using alternate sites. It is estimated that the decrease in recreation use (RVD's) associated with all Allegheny Reservoir facilities would be 35 percent. Impacts to use of ANF facilities along the Allegheny River are expected to be much less. The decrease in canoe and fishing use and picnicking and camping use will be negligible. Overall, this represents a decrease of 22 percent of total RVD's across the ANF.

Table 27. Estimates of Change in RVD's, by Alternative

RVD Category	1998 RVD's	Alt. 1 % Change	Alt. 2 % Change	Alt. 3 % Change
Allegheny Reservoir Total RVD's	2,444,200	0	-35	0
Allegheny River RVD's	391,800	0	≥1	0
TOTAL ANF RVD's	3,906,000	0	-22	0

Economics

In summary, there may be small impacts to local economies related to timber values associated with Alternatives 1 and 2. With Alternative 2, there are additional impacts to local economies as a result of reduced recreation use. In Alternative 3, there are no impacts to local economies beyond those discussed in the Forest Plan FEIS (pp. 4-120 through 122).

Economics Related to Recreation Use

There are no changes anticipated in recreation receipts as a result of Alternatives 1 and 3. Recreation use at ANF facilities is not expected to change. In Alternative 2, recreation use is expected to decrease by 22 percent. Impacts from the reductions in use at the Buckaloons boat launch on the Allegheny River are not anticipated. This use will most likely be displaced to other Allegheny River launch facilities. However, it is highly unlikely other area boat launch facilities will make up for the loss of access from Allegheny Reservoir sites for many area boaters. The distance to the launch sites in NY state is too far (10 to 20 miles north) from the ANF sites on the east side of the reservoir for the average boater to consistently travel in order to enjoy family recreation activities. Distance from the west side are not as great. Some area boaters are likely to give up this form of outdoor recreation entirely. There will be impacts to local businesses with the loss of up to 2 million dollars in the local economy. Local businesses most likely to be affected are those that have a direct dependence on the boating community for support, such as area boat dealers and boat maintenance providers.

Table 28 displays the direct effect of loss of revenue associated with boat use and the indirect effect of loss of revenue associated with other related reservoir recreation activities. The losses reflect a portion of the 35 percent reduction in Table 27.

Table 28. Estimates of Change in Recreation Receipts by Alternative, Based on 1998 Receipts

Activity	1998 Receipts	Alt. 1 Change	Alt. 2 Change	Alt. 3 Change
Boating recreation revenue (24% reduction)	$83,118	0	- $19,948	0
Camping, picnicking, swimming (53% reduction)	$261,461	0	- $133,274	0
TOTALS	$334,579	0	- $153,222	0

There are negligible impacts to local economies anticipated as a result of Alternatives 1 and 3. Alternative 2 is expected to have significant impact to local economies. Recreation programs will continue in Alternatives 1 and 3, with increased program costs associated with screening procedures included in Alternative 1. No changes in RVD's are expected. In Alternative 2, ANF-wide RVD's are estimated to drop by 22 percent. Impact to the local economy can be estimated by using the same multiplier coefficients used in Table 25, page 59, to determine the loss in local revenue associated with the decrease in RVD's in Alternative 2 (Table 29).

Table 29. Estimates of Impacts to Local Economy from Change in Recreation Use on the ANF

Activity	1998 Economic Value	Alt. 1 Change	Alt. 2 Change	Alt. 3 Change
Reservoir related recreation use	$2,972,776	0	(-) $1,380,224	0
Boating related recreation use	$3,088,840	0	(-) $741,321	0
TOTALS	$6,061,616	0	(-) $2,121,565	0

Economic loss can also be expressed in terms of the reduction in the number of jobs that might occur. It is estimated that closing the boat launches would lose approximately 211 jobs. In addition, some local businesses including a boat sales and service facility and a restaurant would be affected. Impacts to other area businesses are also anticipated.

Timber Harvest Values

In summary, compared with the current situation (Alternative 3), S&G's in Alternatives 1 and 2 in most harvest units (especially non-salvage units) are expected to result in small or virtually no change in the total value of the timber harvested from that unit. The discussion included in the "ANF Harvest Treatments and Harvest Volumes" subsection (pp. 4-78 through 4-80) provides additional pertinent information for the following species' discussions. Timber values would not change in Alternative 3 as no new S&G's are proposed.

S&G's 1-5

Existing eagle nests are in areas where timber harvest generally does not occur (Allegheny River corridor). In the event eagles build new nests in areas where timber harvesting is permitted and where harvest opportunities exist, buffer zone requirements in S&G's 1 through 5 (Alternatives 1 and 2) and current requirements in Alternative 3 would preclude timber harvest until such time as the area no longer meets the required conditions. Harvest values at that site would be forgone for that period of. However, we do not expect this situation to develop because eagles seem to prefer to nest in the river corridor. Across most of the ANF, the effect on harvest values would be small unless eagle nests become much more abundant than anticipated.

S&G's 6-12

Proposed S&G's 6 through 12 in Alternatives 1 and 2 are expected to have little impact on harvest volumes in most non-salvage harvest areas (beyond the effects in Alternative 3, the current situation), but could lead to a small reduction in harvest volume in some salvage areas.

Similar situation exists related to impacts on harvest values. In areas where substantial tree mortality has occurred, it may be difficult to find adequate numbers of live trees to leave to meet S&G requirements. Black cherry trees (which may be the only healthy trees left on the site) may be retained on some sites when in Alternative 3 they could have been harvested. In extreme situations, the commercial harvest may be completely forgone. Given the exceptionally high value of this species, leaving Black cherry to meet live tree requirements could affect the total value of timber harvested from some sites. The overall magnitude of the effect however is expected to be small. Though we anticipate resulting effects on harvest value to be small, additional monitoring and evaluation will better quantify the effects when projects are developed. It is unlikely that small changes in ANF timber volumes or values would have any affect on demand for forest products from private lands.

S&G's 14-15

S&G's 14 and 15 are not expected to have any impact on harvest values.

Plans and Programs of Other Agencies

Recreation Providers

In summary, the S&G's proposed in Alternative 1 and implementation of Alternative 3 would result in stable use of all recreation facilities located near the ANF. With no change occurring in ANF boat launch operations, there would be no change expected to occur at launches operated by other providers. Alternative 2 would result in some increase in use at nearby boat launches. The Onoville Marina and Highbank boat launch would most likely be impacted more heavily than other area boat launches, however Highbank may be located too far from the main body of the reservoir and other recreation facilities in Pennsylvania to be a reasonable option for most boating recreationists. The limited capacities of underdeveloped launches would not handle the displaced use from closing the Forest Service launches. Boat use at Tionesta Lake, East Branch Lake and Lake Chautauqua would likely increase if ANF recreationists are displaced to other areas.

County Governments

In summary, the S&G's proposed in Alternative 1 could result in small or virtually no reductions in payments to counties due to reductions in timber and recreation receipts. S&G's proposed in Alternative 2 result in minor reductions in non-timber related payments to counties. Alternative 3 results in no change from current levels of payment.

Safety

In summary, the S&G's proposed in Alternatives 1 and 2 could result in conditions that maintain a greater number of larger diameter, dead trees in stands that have received a harvest treatment as compared with the current situation (Alternative 3). These larger dead trees have a slightly greater chance of being blown down during high wind events than the smaller trees currently being left on site (Alternative 3). The changes that are anticipated are considered to be minor and short term in nature due to the ephemeral nature of dead trees and the minimal change from what occurs under the current situation. There is no change anticipated as a result of S&G's 1 through 5 (for the Bald eagle) or S&G 15 (for Clubshell mussel or Northern Riffleshell mussel).

In Alternatives 1 and 2, S&G's 6 through 10 ensure that suitable roosting habitat (dead trees) will remain following final harvests and optimal roosting habitat following partial harvests. This increase in size and numbers of dead trees over what occurs under existing S&G's in Alternative 3 may result in conditions that are slightly more hazardous as a result of Alternatives 1 and 2. Overall, this difference is negligible as these conditions would be limited to those stands where timber harvest occurs (generally less than 3% annually).

CUMULATIVE EFFECTS AND FUTURE FORESEEABLE ACTIONS

The Forest Plan EIS (pp. 4-61 through 4-122) evaluated cumulative effects as "the result of the application of all management practices needed to provide the outputs and benefits of the selected alternative, Alternative D." Those management practices that depend on or are affected by the new S&G's evaluated in this EIS are called "future foreseeable actions." The cumulative effects described in this section result from the future foreseeable actions of the ANF, as they might be influenced by the alternatives being evaluated in this EIS.

The Forest Plan EIS documented analysis of the cumulative effects of the selected Forest Plan Alternative (Alternative D), assessing where and when each management practice would be applied. Then the Forest Plan EIS documented the magnitude of the qualitative direct and indirect effects (Forest Plan EIS, pp. 4-61 to 4-122).

The Forest Plan EIS also looked at the total effects of all practices proposed for each alternative to provide a comprehensive view of how each alternative would change the various environmental elements. Threatened

and endangered species management was included in the assessment of effects of wildlife management practices and analyzed in the environmental and cumulative effects sections (Forest Plan EIS, pp. 4-1 to 4-122).

The Forest Plan FEIS (Table 4-2, p. 4-6) shows that the effects of all management activities on T&E Species and Species of Concern would be mitigated with the exception of Private Energy Mineral Development. The effects of private mineral development can be mitigated through cooperative implementation of appropriate measures by the private oil and gas operator.

The following discussion summarizes the cumulative effects, by resource element, of implementing S&G's 1 through 15 in Alternatives 1 and 2 versus implementing only the current Forest Plan guidelines (Alternative 3).

PHYSICAL CHARACTERISTICS

Forest Location, Climate, Topography, Air Quality, and Soils

Analysis of these physical resources showed no effects on them from Alternatives 1, 2, or 3 (Chapter 4, effects analysis). Consequently, there cannot be any cumulative effects on these elements. These resources include: location, climate, topography, oil, gas, and minerals; air quality, and soils.

Roads

The implementation of Alternatives 1 or 2 will produce negligible effects to road management. Past, present, and future actions, as well as conditions in the cumulative effects area, are not expected to exceed those effects found pages 4-72 through 4-74. Existing Forest Plan S&G's that provide protection to natural resources may have effects on road management. However, as in the in the effects section, the cumulative effects of these S&G's would be small, if any, since the cumulative S&G's deal mainly with areas that would not likely be a location for road building (i.e. reservoir, steep slopes of various streams). On the ground implementation of the Fisheries Amendment showed little effect on road management and is indicative of impacts that are expected under Alternatives 1 and 2. Therefore, there would be few, if any, cumulative effects to road management with Alternatives 1 and 2. No additional effects would occur with Alternative 3, as there is no additional resource protection proposed.

Powerlines

The effects of implementing Alternatives 1, 2, or 3 are on powerline ROW are negligible. Past, present, and future actions, as well as conditions in the cumulative effects area, are not expected to exceed those effects found on page 74.

Water Quality

The S&G's proposed in Alternatives 1 and 2 would result in no direct changes to water quality (pp 4-74 through 4-75). There are no past activities or known future activities and/or proposals in the cumulative effects area that would change water quality; therefore, there are no cumulative effects from implementing either Alternatives 1 or 2.

Alternative 3 could have an indirect effect on water quality by allowing the Zebra mussel to become established in the Allegheny Reservoir and the Allegheny River. However, past activities and known future activities or proposals in the cumulative effects area are not expected to add to the water quality problems identified on pages 4-74 through 4-75; therefore, there are no cumulative effects from implementing Alternative 3.

BIOLOGICAL CHARACTERISTICS

Analysis of several biological resource elements showed no effects from Alternatives 1, 2, or 3, especially at the programmatic level (pg. 4-76). Consequently, there cannot be any cumulative effects on these elements either. These resources include: forest type, age class distribution, harvest treatments and volumes, reforestation, firewood, composition and structure of communities, and insect defoliations. Other resource areas analyzed did have some effects. The cumulative effects on these resources are discussed below.

Forest Vegetation and Habitat for Threatened and Endangered Species

The effect of implementing Alternatives 1 or 2 on forest vegetation would be a slight change in habitat for the Bald eagle, no change for the T&E mussels, and a slight change in habitat for the Indiana bat. These changes are all for the benefit of the species. Past, present, and future actions, as well as conditions in the cumulative effects area, are not expected to exceed those effects found in Chapter 4. Consequently there will be no cumulative effects to habitat for T&E species from any of the alternatives.

Wildlife Habitat

Management Indicator Species

There may be minor effects on the habitat of several management indicator species (MIS)(pileated woodpecker, red-shouldered hawk, barred owl, and yellow-bellied sapsucker) as a result of S&G's proposed in Alternatives 1 and 2. However, when these effects are considered at the programmatic level, there are virtually no effects on the MIS (p. 82). Past, present, and future actions, as well as conditions in the cumulative effects area, are not expected to exceed those effects found on page 82. Consequently there will be no cumulative effects to MIS from any of the alternatives.

All MIS, other than those listed above and found in Chapter 3 (p. 65), would not be affected. Consequently, there cannot be any cumulative effects on these MIS.

Federally Proposed, Endangered, or Threatened Species and Regionally Sensitive Species

Alternatives 1, 2, and 3 are not expected to have adverse impacts on the Northern long-eared bat. Alternatives 1, 2, and 3 are not expected to cause a trend toward federal listing for the sensitive aquatic fauna (p. 65). The S&G's proposed in Alternatives 1 and 2 are expected to minimize or delay the potential introduction of the Zebra mussel from Forest Service boat launches. Analysis of the cumulative effects area shows that introductions from normal water flows and from non-Forest Service boat launches could allow the Zebra mussel to become established in the Allegheny Reservoir or the Allegheny River. Since the S&G's do not contribute to this establishment, there are no cumulative effects from these alternatives. Alternative 3 does not require actions to limit the spread of the Zebra mussel in the Allegheny drainage from ANF boat launches (p. 74). When considered along with other non-ANF boat launches in the cumulative effects area, there is likelihood that the mussel may become established. However, it is not likely that these cumulative effects will cause a trend toward federal listing for the sensitive aquatic fauna.

Aquatic Resources

The effect on aquatic resources from Alternatives 1 and 2 is to maintain present aquatic conditions by the exclusion of the Zebra mussel from the Allegheny Reservoir and Allegheny River (p. 74). Past and future actions, as well as present conditions in the cumulative effects area, are not expected to exceed those effects found on page 74. Negative cumulative effects will not be greater as the S&G's presented in Alternatives 1 and 2 actually improve the likelihood of a Zebra mussel-free environment.

Alternative 3 does not require actions to limit the spread of the Zebra mussel in the Allegheny drainage from ANF boat launches (p. 74). When considered along with other non-ANF boat launches in the cumulative effects area, there is likelihood that the mussel may become established.

Social/Economic Characteristics

Three of the social/economic resource elements (heritage resources, wild and scenic rivers, visual resources) are not affected by any of the proposed or existing S&G's (p. 86). Consequently, there cannot be any cumulative effects on these elements.

Recreation Resources

Alternative 1 and 3 have negligible impacts on recreation resources (p. 86). Consequently, there no cumulative effects on these elements are expected.

Alternative 2 S&G's will result in considerable impact to the resource from closing boat launches (S&G 14. Other launch facilities within the cumulative effects area will remain open and will have the effect of lessening the impacts of this alternative. However, these cumulative effects are not expected to replace the negative effect on recreation use.

Economics

Alternatives 1 and 3 have negligible impacts to the economies as a result of the S&G's contained therein (p. 89). Consequently, there cannot be any cumulative effects on these elements.

Alternative 2 S&G's will result in considerable impact to the economics from closing boat launches (S&G 14) and thus reducing recreation use (p. 88, 89). Other launch facilities within the cumulative effects area will remain open and will have the effect of lessening the impacts of this alternative. However, these cumulative effects are not expected to replace the negative effect on the economy.

Plans and Programs of Other Agencies

Recreation Providers

Alternatives 1 and 2 should have no effect on recreation providers (p. 91). Consequently, there cannot be any cumulative effects on this element.

Implementing alternative 2 would result in impacts at other boat launches along the Allegheny River and on the Allegheny Reservoir. An increase in use at either the boat launches in New York State on the Allegheny Reservoir, or at other area reservoirs such as Tionesta or East Branch Reservoir, could result in the expansion of existing facilities or the development of new facilities (p. 91). An examination of other facilities located in the cumulative effects area shows no expected closures that would compound the extra demand on the non-ANF facilities. Therefore there are no expected cumulative effects from alternative 2.

Safety

Alternatives 1 and 2 create conditions where a greater number of larger dead trees would be left standing. These trees have a slightly greater chance of falling over than smaller trees (p. 91). Since the danger of falling trees occurs on site, there are no cumulative effects on safety from these two alternatives. Alternative three will not increase the number of larger trees and consequently will not have a cumulative effect.

UNAVOIDABLE ADVERSE IMPACTS

Despite mitigation measures, some adverse effects are unavoidable when implementing these alternatives. The current situation (Alternative 3) is described in the Forest Plan FEIS (p. 4-145).

> In Alternative 2, boating and associated recreation uses would be severely curtailed on the Allegheny Reservoir, a change that would be upsetting or adverse to many people.

In Alternative 3, there is an increased likelihood that Zebra mussels could be introduced into the Allegheny River and Allegheny Reservoir, resulting in a possible reduction of native species from these habitats, an adverse impact.

In Alternative 3, there is a higher likelihood that Clubshell mussels and Northern Riffleshell mussels could be extirpated from the Allegheny River. This would be considered an adverse impact.

Buffer zones around Bald eagle nests in all alternatives could displace road use, trail use, or other forms of dispersed recreation in a few areas of the ANF, but this effect is expected to be negligible unless nests become much more abundant.

Increased numbers of dead trees left on sites presents increased safety risks to forest workers and recreation users of those sites, an adverse effect for people who work on or use those sites. Risks could be slightly higher in Alternatives 1 and 2 where larger and slightly higher number of dead trees may be left on sites. There is an increased risk for these larger exposed trees to blow down during windstorms than for the somewhat smaller trees currently left (Alternative 3) on these types of sites.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible commitment of resources includes the extraction and use of non-renewable resources such that they would not return to their existing condition for a long time. Such losses occur, for example, because oil, gas, or petroleum products are consumed and cannot be replaced. The current situation (Alternative 3 is described in the Forest Plan FEIS (pp. 4-150 through 156).

Alternative 3 (current situation) includes no actions designed to limit introduction of Zebra mussels into the Allegheny River and Allegheny Reservoir. Both Alternatives 1 and 2 are designed, each in a different fashion, to prevent such Zebra mussel introduction from facilities on ANF land. In all three alternatives, there would still be the potential for Zebra mussel introduction from non-ANF boat launches. If a Zebra mussel population were to become established in the Allegheny River or the Allegheny Reservoir, it could be an irreversible commitment from Northern Riffleshell mussel to Zebra mussel production until such time as there is a way to severely limit or eradicate the Zebra mussel population. At this time, there are no known environmentally or economically acceptable techniques that would achieve this objective.

An ***irretrievable commitment of resources*** occurs when opportunities to use or produce a specific resource are forgone for some period of time so that another resource may be produced in its place. If we choose not to manage or produce a particular resource, we do so knowing we lose its potential value had we managed for it.

In Alternatives 1 and 2, S&G's 1 through 5 establish buffer zones to protect abandoned or existing nest trees and roost sites, and they restrict many activities within those zones, an irretrievable commitment of resources for the period of time the buffer zone remains in effect. Unless nests become much more abundant and are located well outside the major river corridors, this type of effect would be negligible. Similar but slightly less restrictive S&G's are included in Alternative 3 (current situation).

In Alternatives 1 and 2, S&G's 6 through 11 include guidelines for leaving certain sizes and numbers of live and dead residual trees in harvest units (Table 6, p. 31). This represents an irretrievable commitment of that timber volume in order to minimize take of the Indiana bat. Alternative 3 (current situation) also contains S&G's calling for retention of certain numbers of live and dead trees in harvest units (Table 5, pp. 21, 22). At this point, we expect the impacts to harvest volume in Alternatives 1 and 2 would be only slightly higher than that in Alternative 3.

In Alternative 2, all ANF boat launches would be closed to prevent Zebra mussels from being introduced into the Allegheny River and Allegheny Reservoir from these facilities. Boating and associated camping recreation would be forgone, though some people may choose to access the reservoir and river from non-ANF facilities. This loss of recreation use would be an irretrievable commitment of the recreation resource. ANF boat launches would remain open in Alternatives 1 and 3, and no such losses would occur.

SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

Short-term uses are those that generally occur on a yearly basis or those that would not be significant beyond 20 years. Long-term productivity refers to the capability of land to produce outputs beyond this same 20-year period. The current situation (Alternative 3) is described in the Forest Plan FEIS (pp. 4-146 through 149).

Management of National Forests is based on the protection of long-term productivity of the land. When decisions are made to produce outputs, long-term productivity could be affected. Generally, Forest Plan S&G's and mitigation measures reduce or eliminate effects on long-term productivity by protecting soil, water, wildlife, and Threatened and Endangered Species.

In Alternative 3, ANF boat launches remain open providing significant amounts of boating opportunities for the public, but there are no provisions to prevent contaminated boats from introducing Zebra mussels into the Allegheny River or Allegheny Reservoir. There is the potential for the short-term, annual boating use to negatively affect long-term productivity of the aquatic resources in these large bodies of water.

Inspecting boats at ANF boat launches in Alternative 1 or closing them in Alternative 2, if effective, would minimize the risk of these kinds of long-term impacts on the aquatic resource. However, in all alternatives there is the risk of Zebra mussels being introduced from boat launches in New York and Pennsylvania that are not ANF facilities, and from free-flowing waters between Lake Chautauqua and the Allegheny River.

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PERSONAL COMMUNICATIONS

Charles Bier, Naturalist, Western Pennsylvania Conservancy

Cal Butchkowski, Wildlife Technician, Pennsylvania Game Commission

David S. deCalesta, Research Wildlife Biologist, Northeastern Research Station, USDA-FS

Mike Fowles, Biologist, U.S. Army Corps of Engineers

Doug Jensen, Biologist, Minnesota Sea Grant

Linda Ordiway, Wildlife Technician, Northeastern Research Station USDA-FS

Brenda Pebbles, Wildlife Technician, Pennsylvania Game Commission

CHAPTER 6 - LIST OF PREPARERS

The following is a list of people involved in the preparation of this EIS along with their education and experience and a listing of papers they have written, if any, related to or providing background for this Environmental Impact Statement.

DeMARCO, Lois **Silviculturist/Analyst** **ID Team Member; Primary Author**

Education: B.S. Forestry; Technical Training in Silvicultural Practices for Allegheny Hardwoods; Continuing Education in Forest Management; Silviculture and Prescription Training.

Experience: 2 years, USDA-Northeast Forest Experiment Station, and 21 years, USDA-Forest Service in forest management, silviculture, analysis.

Papers: Appendix E documents for the December 1998 Biological Assessment for Threatened and Endangered Species on the Allegheny National Forest (A Site-specific Assessment of Indiana Bat habitats on the ANF, and Impacts Anticipated to Occur which Affect Habitat; Analysis of the Landscape Condition of Vegetation on the Allegheny National Forest; An Analysis of the Condition of Vegetation in Stands Following Timber Harvest on the Allegheny National Forest; and ANF Standards for Indiana Bat Habitat in Final Harvest Units).

KELL, Gary **Forest Planner** **ID Team Leader**

Education: B.S. Landscape Architecture; Recreation Short Course

Experience: 29 years, USDA-Forest Service; Forest Landscape Architect, Recreation/Wilderness Program Leader; Forest Planning Team; Forest Planner

Papers: ANF Land and Resource Management Plan, FEIS (Served as one of five principal preparers. Coordinated development of sections pertaining to recreation, wildlife, and engineering portions of the EIS and Forest Plan. Wrote significant portions of the Forest Plan and FEIS.).

IRVINE, Arnie **Design Team Leader-Bradford RD** **ID Team Member**

Education: B.S. Forestry, Recreation Short Course, postgraduate work in hydrology

Experience: 27 years, USDA-Forest Service, Watershed & River basin Planner, Wild & Scenic River planner, recreation/wilderness manager, NEPA coordinator.

Papers: Minneapolis/St. Paul Metropolitan Comprehensive Management EIS, Wisconsin River Basin EIS, Missouri River Basin EIS, Allegheny W&SR EIS, and numerous project level EAs.

NELSON, Brad **Wildlife Biologist** **ID Team Member**

Education: B.S. Animal Science; M.S. Wildlife Management

Experience: 7 years, USDI-Bureau of Land Management and 13 years, USDA-Forest Service in wildlife management.

Papers: Biological Assessment for Threatened and Endangered Species on the Allegheny National Forest, December 1998;

Final Environmental Impact Statement, Understory Vegetation Management on the ANF, 1991;

Nelson, B.B. *et al.,* 1997. Communicating Old-Growth Forest Management on the Allegheny National Forest. In Proceedings of the 1997 National Silviculture Workshop. Gen Tech Rpt NE-238. Warren PA. pp. 85-89.

Nelson, B.B. and K. Titus. 1988. Silviculture Practices and Raptor Habitat Associations in the Northeast. Northeast Raptor Symposium, National Wildlife Federation. Syracuse, New York. pp. 171-179.

Nelson, B.B. and L.R. Auchmoody. 1987. Fertilization of Young Clearcuts. In Deer, Forestry and Agricultural Interactions and Strategies for Management. Warren, PA. pp. 108-117.

WHITE, Robert **Forest Silviculturist** **ID Team Member**

Education: B.S., Forest Science; Certified Silviculturist in Region 9 since 1980. Technical training in pesticide uses and human health risk analysis.

Experience: 26 years, USDA-Forest Service: 5 years on Ranger Districts in timber and wildlife; 1 year policy analysis , Washington Office; 2 years assistant Ranger for minerals, recreation, and human resources; 17 years in Supervisor's Office as program analyst in land management planning, Forest Silviculturist, and pesticide use coordinator.

Papers: ANF Land and Resource Management Plan, FEIS (Served as one of five principal preparers. Coordinated development/analysis and wrote sections pertaining to timber, lands, and minerals resources.

ANF Understory Vegetation Management EIS. 1991. Co-author.

ANF FEIS for Vegetation Management on Electric Utility Rights-of-way. 1997. One of two principal ANF consulting authors for the contract.

ANF Analysis of Timber Harvest Program Capabilities, 1995-2005. 1995. Principal author.

Characteristics of Declining Stands on the ANF. USDA-FS, NEFES Research Note NE-360. June 1996. Co-author.

Allegheny National Forest Health. In Forest Health through Silviculture, Proceedings of the 1995 National Silviculture Workshop. USDA-FS. Rocky Mountain Forest and Range Experiment Station; RM-GTR-267; September 1995.

CHAPTER 7 - DEIS AND FEIS MAILING LISTS

DEIS MAILING LIST

Copies of the Draft Environmental Impact Statement and/or a Summary of the DEIS were made available to the following individuals and organizations:

Indian Nations:

Seneca Nation of Indians, Duane Ray, President
Seneca Nation of Indians, Lisa Maybee
Seneca Nation of Indians, Lana K. Watt

Federal:

Honorable William J. Coyne, U.S. House of Representatives
Honorable Mike Doyle, U.S. House of Representatives
Honorable Phil English, U.S. House of Representatives
Honorable George Gekas, U.S. House of Representatives
Honorable William F. Goodling, U.S. House of Representatives
Honorable James Greenwood, U.S. House of Representatives
Honorable Paul E. Kanjorski, U.S. House of Representatives
Honorable Ron Klink, U.S. House of Representatives
Honorable Frank Mascara U.S. House of Representatives
Honorable John P. Murtha, U.S. House of Representatives
Honorable John Peterson, U.S. House of Representatives
Honorable Rick Santorum, U.S. Senate
Honorable Don Sherwood, U.S. House of Representatives
Honorable E. G. "Bud" Shuster, U.S. House of Representatives
Honorable Arlen Specter, U.S. Senate
US Army Corps of Engineers, Kinzua Dam
US Environmental Protection Agency, Office of Federal Activities
US Environmental Protection Agency, Region III
USDA-FS, Chequamegon National Forest
USDA-FS, Chippewa National Forest
USDA-FS, Green Mountain/Finger Lakes National Forests
USDA-FS, Hiawatha National Forest
USDA-FS, Hoosier National Forest
USDA-FS, Huron-Manistee National Forest
USDA-FS, Mark Twain National Forest
USDA-FS, Monongahela National Forest
USDA-FS, Ottawa National Forest
USDA-FS, Shawnee National Forest
USDA-FS, Superior National Forest
USDA-FS, Wayne National Forest
USDA-FS, White Mountain National Forest
USDA-FS, Region 9
USDA-FS, WO, Environmental Coordination Staff
USDA National Agricultural Library
USDA Natural Resources Conservation Service
USDA Office of Civil Rights
USDI Fish and Wildlife Service, State College Field Office
USDI Office of Environmental Policy and Compliance

State:

Honorable Stewart Greenleaf, PA House of Representatives
Honorable Kenneth Jadlowiec, PA House of Representatives
Honorable James Lynch, PA House of Representatives
Honorable William Slocum, PA Senate
Honorable Dan Surra, PA House of Representatives
Pennsylvania Fish and Boat Commission, Ron Lee
Pennsylvania Fish and Boat Commission, Andrew Shiels
Pennsylvania Game Commission, Robert W. Schlemmer

Local/Regional:

Elk County Commissioners
Erie County Dept. of Health, Robert Wellington
Forest County Commissioners
Forest County Conservation District, Douglas E. Carlson
McKean County Commissioners
Mead Township Supervisors, Terry L. Hawk
North Central PA Regional Planning and Development, Erin Dixon
Ridgway Township, Milly Bowers
Warren County Commissioners

Businesses/Individuals/Organizations:

Allegheny Alive, David E. Martin
Allegheny Defense Project, James Kleissler
Allegheny Defense Project, John A. Keslick, Jr.
Allegheny Defense Project, Josh R. Cohn
Allegheny Forest Alliance, Steven Troha, Executive Director
Allegheny Hardwood Utilization Group, Susan Swanson
Allegheny Outdoor Club, Don Dorn
Allegheny Outdoor Club, Bill Massa
Allegheny Particleboard, Daniel Goldsmith
Allegheny Particleboard, Michael Yancey
Armstrong, Rosie Lee
Bat Conservation International
Benim, Robert C.
Besecker, William
Booker, James F., College of Business, Alfred University
Boucher, Carla
Brady, Jason
Bray, Marty
Brown, Dennis
Callen, Doug
Che, Deborah, Clark University, Graduate School of Geography
Clean Air Council, John Sinker
Clow, Jr., Arthur P.
Compeau, Kelly
Cornell Greens, Kristin Ruether
Cubbon, Nancy
Dalby, Peter, Ph.D., Clarion Univ. of PA
Denmare, Joe
Denmarsh, T. Alexander
Disque, Melinda
Donofrio, Vince
Dotterrer, Robert L.
Dukelow, Donald
Eckert, Theresa J.
Edward Oil Company, John E. McCool
Erie Times-News, John Bartlett
Evans, Bill
Fay, Meghan A.
Friends of the Nescopeck, Alan C. Gregory
Funtal, Carl
GPU Energy, Matt Belinda
Gearhart, Porter H.
Georgia-Pacific, Kevin R. Stout
Grisez, Ted
Hardner, Norbert
Heartwood, James Bensman
Heartwood, Devin M. Scherubel
Henschel, Edward Jr.
Hill, Russell
Hines, James
Hishman, Paul F.
Horizon Woods Products, George Terbovich
Hughes, Liz

Hughes, Shannon
Ingerson, Lawrence
Island Run Sportsmen's Club
Johnson, Newkirk L.
Kaisar, Michael and Eloise
Kase, Tom
Kershner, Mark
Keslick, Wendy
Kinzua-Wolf Run Marina, Diane DeLarme
Koryak, Michael
Kosaber, Mike
Kuth, John A. C., Jr.
Labar, Robert J.
Lawrence, Henry, Dept. of Geosciences, Edinboro University of PA
Leslie, Robert
Long, Eli
Long, Paul
Luneburg, William V.
Lyle, Melanie
Manahan, Frank III
Marshall, Beth A.
Matson Wood Products, Len Dominic
McDonald, Douglas
McGreevy, Jonah
McKeesport Sportsmen's Association, Inc., Harvey E. West
Moran, Keith
Nagy Forestry Services, William Nagy
Neel, Charles A.
North East Hardwoods, Joseph Plummer
Ohio River Basin Commission
Onoville Marina, Jeff Davis
Orzechowski, Francis J.
PA Forest Industry Association, Dale E. Anderson
PA Hardwoods Development Council, Paul Lyskava
Pagano, Charles L.
Pennylvania State University Cooperative Extension, Tim Pierson
Pittsburgh Climbers, Robert Ruffing
Pittsburgh Post-Gazette, Don Hopey
Quinney Natural Resources Research Library, Utah State University
Rafson, Clifford
Ram Forest Products, Inc., Rich LaBrozzi
Rastatter, Thomas F.
Rauch, James
Raught, Marjorie A.
Raybuck, Howard
Roach, Dennis
Robinson, Everett
Rooney, Thomas
Rozday, John P.
Ruff, Donna
Ruffed Grouse Society, Dan Dessecker
Schaadt, Hoagy, Ph.D., Pennsylvania State University
Sexton, Alan D.
Shannon, Ken
Slatedale Rod and Gun Club, Inc., Warren F. Wanamaker
Snyder Brothers, Inc., Dave O'Hara
Spring, Carl S.
Steiner, Linda
Stoudt, Bob
Stow, John H.
Summit Resources, Inc., Charles H. Alexander
Sundheimer, Paul W.
Swanson, David
Tarr, John D.
The Bradford Era, Jim Buck
The Dean Company, C.E. Fulcher
Todd, M. McCoon
Tuberson, Bill
Vachuda, Tomas J.
VanNostrand, Shawn
Wainer, Heather M.
Waite, James
Waite, Jerry P.
Walters, Russell S.
Wester, Donald E.
White, David
Wice, Richard B.
Wirth, Mary
Zehr, Brian

FEIS MAILING LIST

Copies of the Final Environmental Impact Statement and/or a Summary thereof were made available to the following individuals and organizations. Individuals whose names are followed by an * sent in written comments, but did not provide an address.

Indian Nations:

Seneca Nation of Indians, Duane Ray, President
Seneca Nation of Indians, Lisa Maybee
Seneca Nation of Indians, Natural Resource Manager

Federal:

Honorable Phil English, U.S. House of Representatives
Honorable James Greenwood, U.S. House of Representatives
Honorable Ron Klink, U.S. House of Representatives
Honorable John P. Murtha, U.S. House of Representatives
Honorable John Peterson, U.S. House of Representatives
Honorable Rick Santorum, U.S. Senate
Honorable Don Sherwood, U.S. House of Representatives
Honorable E. G. "Bud" Shuster, U.S. House of Representatives
Honorable Arlen Specter, U.S. Senate
US Army Corps of Engineers, Kinzua Dam
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USDA-FS, Region 9
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USDA National Agricultural Library
USDA Natural Resources Conservation Service, Barry Frantz
USDI Fish and Wildlife Service, State College Field Office
USDI Office of Environmental Policy and Compliance

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Honorable Dan Surra, PA House of Representatives
Pennsylvania Fish and Boat Commission, Ron Lee
Pennsylvania Fish and Boat Commission, Andrew Shiels
Pennsylvania Game Commission, Robert W. Schlemmer
Pennsylvania Historic Museum Commission, Paul Funk

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North Central PA Regional Planning and Development, Erin Dixon
Ridgway Township Board of Supervisors, Carl Griswell, John E. Gardner, and Edward P. LaValle
Warren County Commissioners

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Allegheny Alive, David E. Martin
Allegheny Defense Project, James Kleissler, Newkirk Johnson, and Rachel Martin
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Allegheny Defense Project, Josh R. Cohn
Allegheny Defense Project, Shannon Hughes
Allegheny Forest Alliance, Jack Hedlund, Executive Director
Allegheny Hardwood Utilization Group, Susan Swanson
Allegheny Outdoor Club, Bill Massa
Allegheny Outdoor Club, Don Dorn
Allegheny Particleboard, Daniel Goldsmith
Allegheny Particleboard, Michael Yancey
American Lands Alliance, Kristen Sykes
Armstrong, Rosie Lee
Baker, Chris
Banbeau, Julie
Bat Conservation International
Beinhaver, Justin
Benim, Robert C.
Besecker, William
Booker, James F., College of Business, Alfred University
Boucher, Carla
Boyle, Drisanna
Brady, Jason
Brainerd, William E.
Brandsdorfer, Steven
Bray, Marty
Brown, Dennis
Browngoehl, Kevin, M.D.
Buckeye Forest Council, Jason Tockman
Callen, Doug
Causer, William *
Che, Deborah, Clark University, Graduate School of Geography
Clean Air Council, John Sinker
Clow, Jr., Arthur P.
Compeau, Kelly
Cornell Greens, Kristin Ruether
Curry, Susan
Dalby, Peter, Ph.D., Clarion Univ. of PA
Daly, Tina
Davis, Marie
Demos, John
Denmare, Joe
Denmarsh, T. Alexander
Disque, Melinda
Donofrio, Vince
Dotterrer, Robert L.
Dukelow, Donald
Eckert, Theresa J.
Edward Oil Company, John E. McCool
Erie Times-News, John Bartlett
Evans, Bill
Fay, Meghan A.
Feldman, Ben
Fish, Vicki *
Funtal, Carl
Gardner, John E.
Gash, Abby
Gearhart, Porter H.
Georgia-Pacific, Kevin R. Stout
Gorman, Rick *
GPU Energy, Matt Belinda
Greater Wyoming Valley Audubon Society, Alan Gregory
Grisez, Ted
Group 4280, Peter Hutchinson
Halpen, Jennifer
Hanes, Shane
Hardner, Norbert
Head, David
Heartwood, Devin M. Scherubel
Heartwood, James Bensman
Helbling, Pamela

Henschel, Edward Jr.
Hill, Russell
Hines, James
Hishman, Paul F.
Horizon Woods Products, George Terbovich
Hughes, Liz
Ingerson, Lawrence
Island Run Sportsmen's Club
James Ray Howard
Jedlicka, James
Johnson, Don
Kase, Tom
Kear, Sue *
Kelley, Susan M.
Kentucky Heartwood, Chris Schmoeller
Kershner, Mark
Kerwin, Bridget *
Keslick, Carolyn
Keslick, Wendy
Kinzua-Wolf Run Marina, Diane DeLarme
Kora, Christina D.
Koryak, Michael
Kosaber, Mike
Kuth, John A. C., Jr.
Labar, Robert J.
LaFort, Paul and Eileen
Lawrence, Henry, Dept. of Geosciences, Edinboro University of PA
Leslie, Robert
Lewis (name incomplete)
Lewis, Marvin
Long, Eli
Long, Paul
Luneburg, William V.
Lyle, Melanie
Manahan, Frank III
Marshall, Beth A.
Martin, Joseph V.
Matson Wood Products, Len Dominic
McDonald, Douglas
McGreevy, Jonah
Ruff, Donna
Ruffed Grouse Society, Dan Dessecker
Schaadt, Hoagy, Ph.D., Pennsylvania State University
Scharf, Stanley S. *
Sexton, Alan D.
Shannon, Ken
Shivley, Daniel C.
Simson, Christa
Sins, L. Hale
McKeesport Sportsmen's Association, Inc., Harvey E. West
Moran, Keith
Morris, Gregg
Mueller, PhD., Robert F.
Muessig, Daniel
Murawski, Susan
Nadle, Jonathan
Nagy Forestry Services, William Nagy
Nalbone, Jennifer
Neel, Charles A.
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Pennsylvania League of Conservation Voters, William Coleman
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Pittsburgh Climbers, Robert Ruffing
Pittsburgh Post-Gazette, Don Hopey
Powell, Richard H.
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Rafson, Clifford
Ram Forest Products, Inc., Rich LaBrozzi
Rastatter, Thomas F.
Rauch, James
Raught, Marjorie A.
Raybuck, Howard
Reinmann, Andy
Ricciondi, Richard *
Roach, Dennis
Robinson, Everett
Rozday, John P.

Slatedale Rod and Gun Club, Inc., Warren F. Wanamaker
Snyder Brothers, Inc., Dave O'Hara
Spring, Carl S.
Steiner, Linda
Stoudt, Bob
Stow, John H.
Strock, Jesse
Student Environmental Action Coalition, Michael Kaisar
Sudash, Tracy A. *

Summit Resources, Inc., Charles H. Alexander
Sundheimer, Paul W.
Swanson, Bevevino, Gilford and Stewart, Arthur Stewart, Esq.
Swanson, David
Talbot, Ryan
Tarr, John D.
Taylor, Terri
The Bradford Era, Jim Buck
The Dean Company, C.E. Fulcher
Todd, M. McCoon
Toy, Brian
Trent, Nancy
Tuberson, Bill
University of Wisconsin, Thomas Rooney
Vachuda, Tomas J.
VanNostrand, Shawn
Wainer, Heather M.
Waite, James
Waite, Jerry P.
Walters, Russell S.
Ward, Saralyn
Weeks, Cynthia
Welhasch, Olena
Wester, Donald E.
White, David
Wice, Richard B.
Wickelhaus, Martha
Wirth, Mary
Wolfram, Wayne
Wood-Campbell, Karen
Wygand, Doris *
Zehr, Brian
Zellie, Heidi

CHAPTER 8 - GLOSSARY

This glossary includes many key words and concepts used throughout the document. However, some of the more commonly-used terms that are not listed here can be found in one or more of the following sources: The Forest Plan Glossary; The Dictionary of Forestry, John H. Helms, Ed. The Society of American Foresters, 1998, 210 pp., and New Webster's Dictionary and Thesaurus of the English Language, Lexicon Publications, Inc., 1993.

Adaptive Management -- A type of forestland management in which, as an ongoing process, the monitoring of results of management decisions, in relation to sustaining ecosystem characteristics and changes in societal goals, is used to modify management approaches.

Affected Environment -- The baseline environment of the relative resource components.

Allegheny Hardwoods -- Forest type containing black cherry, red maple, yellow poplar, white ash and sugar maple. Fifty percent of the basal area must be in cherry, ash and poplar.

Allegheny National Forest Land and Resource Management Plan (Forest Plan) -- A plan developed and approved in April 1986 to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended (95-125, 129, 130). This plan guides all natural resource management activities and establishes management activities, standards and guidelines for the Allegheny National Forest.

Allowance for take -- Through formal consultation the Fish and Wildlife Service determines the level of take that is permitted for each threatened or endangered species. This level of take must not jeopardize the continued existence of the species (see also "take.")

Anabat surveys -- Surveys using a device that detects the ultrasonic calls of bats. One such detector is manufactured in Australia and is called an anabat detector.

Annual (plant) -- A plant species living and growing for only one year or season.

Aquatic --Pertaining to standing and running water in streams, rivers, lakes and ponds.

Aquifer -- An underground zone of earth or rock saturated with water whose upper limit is the water table.

Best Management Practices (BMP) -- A practice or combination of practices that is determined by a State (or designated wide-area planning agency) after problem assessment, examination of alternative practices, and appropriate public participation to be the most effective, practicable (including technological, economic, and institutional considerations) means of preventing or reducing the amount of pollution generated by non-point sources to a level compatible with water quality goals.

Biodiversity -- The diversity of life in an area, including the diversity of genes, species, plant and animal communities, ecosystems, and the interaction of these elements.

Biological diversity -- The variety and abundance of life forms, processes, functions, and structures, including the relative complexity of species, communities, gene pools, and ecosystems at spatial scales that range from local through global.

Biological Assessment (BA) -- Information prepared by a Federal agency to determine whether a proposed action is likely to: (1) adversely affect listed species, (2) jeopardize the continued existence of species, or (3) adversely modify critical habitat. Biological Assessments must be prepared for "major construction activities". The outcome of this biological assessment determines whether formal consultation or a conference is necessary.

Biological opinion (BO) -- An official report by the USDA Fish and Wildlife Service or the National Marine Fisheries Service issued in response to a formal Forest Service request for consultation or conference. It

states whether an action is likely to result in jeopardy to a species or adverse modification of its critical habitat.

Browse -- That part of leaf and twig growth of shrubs, woody vines and trees on which browsing animals can feed; to consume browse.

Buffer strip (filter strip) -- A strip of vegetation that is left unmanaged or is managed to reduce the impact that a treatment or action on one area would have on an adjacent area.

Canopy -- The foliar cover in a forest stand consisting of one or more layer.

Carrying Capacity -- The maximum number of animals that a habitat can sustain while maintaining the ecosystem in a healthy, vigorous condition.

Code of Federal Regulations (CFR) -- A codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government. The Code is divided into 50 titles that represent broad areas subject to Federal regulations. Each title is divided into chapters, which usually bear the name of the issuing agency. Each chapter is further subdivided into parts covering specific regulatory areas.

Connected actions -- Management practices or actions which 1) automatically trigger other actions that may require environmental impact statements; 2) cannot or will not proceed unless other actions are taken previously or simultaneously; or 3) are interdependent parts of a larger action and depend on the larger action for their justification.

Conservation program -- As directed under Section 7(a)(1) of the Endangered Species Act "All other Federal agencies shall...utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species... ." The Conservation Program for the Allegheny National Forest (Appendix A) includes all of the actions the National Forest will take to conserve the species.

Conservation recommendation -- The Fish and Wildlife Service's non-binding suggestions resulting from formal or informal consultation that identify discretionary activities an agency can take to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans or to develop information.

Conservation strategy -- Documentation of the management actions necessary to conserve a sensitive species. Establishes conservation objectives and develops management actions needed to accomplish those objectives.

Constraint -- Limitation; action which cannot be taken or which must be taken.

Corridor -- A linear strip of land identified for present or future location of transportation or utility rights-of-way within its boundaries.

Cultural (Heritage) Resources -- The tangible and intangible aspects or cultural systems, living or dead, that are valued by a given culture or which contain information about the culture. Cultural resources include but are not limited to sites, structures, buildings, districts, and objects associated with or representative of people, cultures and human activities and events. Cultural resources are commonly discussed as prehistoric and historic values, but each period represents a part of the full continuum of culture values from the earliest to the most recent.

Cumulative Impacts -- The impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably-foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant action taking place over a period of time (40 CFR 1508.7).

Developed Recreation -- Recreation requiring facilities that result in concentrated use of an area. Examples are campground and picnic areas. Facilities might include roads, parking lots, picnic tables, drinking water or toilet buildings.

Diameter at breast height (DBH) -- A measurement of tree diameter taken 4.5 feet from the ground.

Dispersed Recreation -- Lands and waters under Forest Service jurisdiction that are not developed for intensive recreation use. Dispersed areas include general undeveloped areas, roads, trails and water areas not treated as developed sites.

Diversity -- The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan.

EA -- See environmental assessment.

EPA -- Acronym for the U.S. Environmental Protection Agency.

Early successional wildlife species -- Animals that use young forests or new habitats. Succession is the sequence of ecological stages beginning with grass/shrub/seedling communities and progressing to a climax forest. Early successional refers to the beginning stages such as the grass/shrub/seedling stage.

Ecosystem -- A conceptual unit comprised of organisms interacting with each other and their environment having the major attributes of structure, function, complexity, interaction, and interdependency, temporal change, and no inherent definition of spatial dimension.

EIS -- See Environmental impact statement.

Endangered species -- Any species that is in danger of extinction throughout all or a significant part of its range. Endangered species must be designated in the Federal Register. (See Threatened species)

Endangered species Act (ESA) -- An act passed by Congress in 1973 to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved and to provide a program for conservation of such species.

Endemic -- Native or confined to a certain region; having comparatively restricted distribution.

Environmental analysis -- An analysis of alternative actions and their predictable short- and long-term environmental consequences.

Environmental consequences (Effects or Impacts) -- The physical, biological, social and economic results (good or bad) of implementing a given alternative.

Environmental assessment (EA) -- A document that briefly provides sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement or to return a finding of no significant impact, aids an agency's compliance with NEPA when no Environmental Impact Statement is necessary, or facilitates preparation of a statement when one is necessary.

Environmental impact statement (EIS) -- A formal document to be filed with the Environmental Protection Agency that considers significant environmental impacts expected from implementation of a major Federal action.

Ephemeral -- Lasting for a brief time; short-lived; transitory.

Erosion -- The wearing away of the land's surface by running water, wind, ice and other geological agents. The detachment and removal of soil from the land surface by wind, water or gravity.

Even-aged silvicultural system -- The application of a combination of actions that result in the creation of stands in which trees of essentially the same age grow together. Managed even-aged forests are characterized by a distribution of stands of varying ages (and, therefore, tree sizes) throughout the forest area. The difference in age between trees forming the main canopy level of a stand usually does not exceed 20

percent of the age of the stand at harvest rotation age. Regeneration in a particular stand is obtained during a short period at or near the time that a stand has reached the desired age or size for regeneration and is harvested. Clear-cut, shelterwood, or seed tree cutting methods produce even-aged stands.

Fauna - The animals of a given region or period.

Floodplain -- Low land and relatively flat areas joining inland and coastal waters, including debris cones and flood prone areas of off-shore islands. The minimum area included is that subject to a one percent (100-year recurrence) or greater chance of flooding in any given year.

Flora -- The plants of a given region or period.

Forb -- Any herbaceous plant other than grass or grass-like plants.

Forest land -- Land at least 10 percent occupied by forest trees of any size or formerly having had such tree cover and not currently developed for non-forest use.

Forest road – A road wholly or partly within, or adjacent to, and serving the National Forest System and necessary for the protection, administration, and use of the National Forest System and the use and development of its resources (Title 23, USC, section 101).

Forest Service Policy -- Policy set by Forest Service Manuals and specific National Forest Land and Resource Management Plans.

Forest type -- A descriptive term used to characterize the species composition of a stand of trees.

Forest-wide Standards and Guidelines -- A set of statements which define or indicate acceptable norms, specifications or quality that must be met when accomplishing an activity or practice under a given set of conditions on the Allegheny National Forest.

Formal consultation -- a process between the USDI-Fish and Wildlife Service and a Federal agency that: 1) determines whether a proposed Federal action is likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat; 2) begins with a Federal agency's written request and submittal of a complete initiation package; and 3) concludes with the issuance of a biological opinion and incidental take statement.

FWS - Acronym for USDI-Fish and Wildlife Service. Also referred to as USDI-FWS. The Federal agency responsible for administering the Endangered Species Act.

Goal -- A concise statement that describes a desired condition to be achieved sometime in the future. It is generally expressed in broad, general terms and usually does not have a specific date for completion.

Goods and Services -- The various outputs, including on-site uses, produced from forest and rangeland resources.

Ground water -- Water residing in the interstices of soil and rock below the ground surface.

Group selection harvest -- A timber harvest method used in uneven-aged management. It involves the removal of small groups of trees to meet a predetermined goal of size, distribution and species in the remaining stand.

Guideline -- An indication or outline of policy or conduct.

Habitat -- The natural environment of a plant or animal. An animal's habitat includes the total environmental conditions for food, cover and water within its home range.

Habitat capability -- The ability of the vegetative community to provide food, cover, and water for wildlife.

Harvest -- Cutting or removal of trees from the forest for utilization.

Harvest method -- A cutting method by which a stand is logged. Emphasis is on meeting logging requirements while concurrently attaining silvicultural objectives.

Herbaceous -- A plant that does not develop persistent woody tissue above the ground (annual, biennial or perennial), but whose aerial portion naturally dies back to the ground at the end of a growing season. Herbaceous plants include such categories as grasses, grass-like (sedges, rushes) and forbs.

Herbicide -- A chemical used to control, suppress or kill plants, or to severely interrupt their normal growth processes.

Herbivore -- An animal that exclusively eats plants.

High risk trees -- Trees with a high probability of dying in the immediate future.

Incidental take -- Take of listed fish or wildlife species that result from, but is not the purpose of, carrying out an otherwise lawful activity conducted by a Federal agency or applicant.

Implementing regulations -- Regulations generated by an agency to implement an Act of Congress; i.e., 36 CFR 219 contains implementing regulations for the Forest and Rangelands Renewable Resource Planning Act of 1974 (RPA) and the National Forest Management Act (NFMA).

Indicator species -- A species whose presence in a certain location or situation at a given population level indicates a particular environmental condition. Their population changes are believed to indicate effects of management activities on a number of other species or water quality.

Indicators -- Specific variables that, singly or in combination, are taken as indicative of the condition of the overall opportunity class. These variables allow the manager to unambiguously define desired conditions and to assess the effectiveness of management practices.

Informal consultation -- An optional process that includes all discussions and correspondence between the Fish and Wildlife Service and a Federal agency prior to formal consultation, to determine whether a proposed Federal action may affect listed species or critical habitat. This process allows the Federal agency to utilize the Fish and Wildlife Service's expertise to evaluate the agency's assessment of potential effects or to suggest possible modifications to the proposed action that could avoid potentially adverse effects.

Insecticide -- An agent used to control insect populations.

Interdisciplinary (ID) Team -- A group of two or more individuals with different training assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad enough to solve the problem. The members of the team proceed to solution with frequent interaction so that each discipline may provide insights to any stage of the problem and disciplines may combine to provide new solutions.

Intermediate harvest -- Any removal of trees from an even-aged stand between the time of its formation and the regeneration harvest.

Intermittent stream -- A stream that flows seasonally (10-90 percent of the time) in response to a fluctuating water table, with a scoured channel that is at least three feet wide.

Intolerant species – A tree or other plant species that does not grow well in shade.

Issue -- A subject or question of widespread interest identified through public participation and which relates to the management of National Forest System lands. A matter of controversy or dispute over resource management activities or land use that is well defined and/or topically discrete. Usually the causal relationship between the activity or use and the undesirable results are well defined or able to be documented. Statement of the planning issues orients the management planning process.

Land management -- An intentional process of planning, organizing, programming, coordinating, directing and controlling land use action.

Macroinvertebrate -- an invertebrate animal (without backbone) large enough to be seen without magnification.

Management Area (MA) -- A land area that has common management direction to achieve a common goal. The entire Allegheny National Forest is divided into management areas.

Management Direction -- A statement of multiple-use and other goals and objectives, the management prescriptions, associated standards and guidelines, and action plans for attaining them.

Management indicator species -- See "indicator species."

Management intensity -- The management practice or combination of management practices and their associated costs designed to obtain different levels of goods and services.

Management practice -- A specific action, measure or treatment.

Mineral development -- To open up a mineralized seam, ore body or deposit for production.

Mitigate -- To cause to become less harsh or harmful.

Mitigation measure -- An action taken to lessen adverse impacts or enhance beneficial effects.

Multiple use -- The management of all the various renewable surface resources of the National Forest System so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some lands will be used for less than all of the resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of the uses that will give the greatest dollar return or the greatest unit output.

Native Species -- Any specie of flora or fauna that naturally occurs in the United States and that was not introduced by humans.

Natural -- Existing and/or formed by nature. Not artificial.

Natural regeneration -- An age class created from natural seeding, sprouting, suckering, or layering.

NEPA – Acronym for National Environmental Policy Act

NFMA – Acronym for National Forest Management Act

No action alternative -- The most likely condition expected to exist in the future if current management direction would continue unchanged.

Objective -- A clear and specific statement of planned results to be achieved within a stated time period. The results indicated are those that are designed to achieve the desired condition represented by the goal. An objective in measurable and implies precise time-phase steps to be taken and resources to be used which, together, represent the basis for defining and controlling the work to be done.

Overstory -- Relative to even-aged stands; the nature trees that overtop the younger trees.

Percent stocking -- The number of trees in a stand as compared to the desirable number for best growth and management, expressed as a percent.

Perennial -- A plant species having a life span of more than two years.

Perennial stream -- A stream that flows year-round (more than 90 percent of the time) with a scoured channel that is always below the water line.

Pesticide -- Any substance or mixture of substances intended for controlling insects, rodents, fungi, weeds or other forms of plant or animal life that are considered to be pests.

pH -- A scale for measuring acidity and alkalinity.

Plant community -- An association of plants of various species found growing together in different areas with similar site characteristics.

Policy -- A guiding principle upon which a specific decision or set of decisions is based.

Project -- An organized effort to achieve an objective identified by location, activities, outputs, effects and time period and responsibilities for execution.

Public Involvement -- A Forest Service process designed to broaden the information base upon which agency decisions are made by: 1) informing the public about Forest Service activities, plans and decisions; and 2) encouraging public understanding about and participation in the planning processes which lead to final decision-making.

RPA -- Acronym for the Forest and Rangelands Renewable Resource Planning Act of 1974.

Raptors -- Birds of prey such as owls, hawks and eagles.

Rare Species -- Any plant or animal that, although not presently threatened with extinction, is in such small numbers through its range that it may be endangered if its environment worsens; the "rare" category is a State, not Federal, category.

Reasonable and prudent alternatives -- Recommended alternative actions identified during formal consultation that can be implemented in a manner consistent with the intended purpose of the action, that can be implemented in a manner consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that the Director of the USDI-Fish and Wildlife Service believes would avoid the likelihood of jeopardizing the continued existence of listed species or the destruction or adverse modification of designated critical habitat.

Reasonable and prudent measures -- Actions the FWS Director believes necessary or appropriate to minimize the impacts, i.e., amount or extent of incidental take.

Record of Decision (ROD) -- The documentation of what the decision was, the date, and a statement of reasons for the decision.

Recreation Opportunity Spectrum (ROS) -- A system of classifying the range of recreational experiences, opportunities and settings available on a given area of land. The six classifications are:

Primitive (P) - an unmodified environment, where trails may be present but structures are rare, and where probability of isolation from the sights and sounds of humans is extremely high.

Semi-primitive non-motorized (SPNM) - characterized by a predominantly natural appearing landscape where isolation from the sights and sounds of humans is expected. Experiences are more solitary in nature in an environment that offers challenge and risk. Motorized use is not permitted.

Semi-primitive motorized (SPM) - characterized by a predominantly natural appearing landscape where isolation from the sights and sounds of humans is expected. Experiences are more solitary in nature in an environment that offers challenge and risk. Motorized use is permitted.

Roaded Natural (RN) - characterized by a mosaic of different age classes appearing as a predominantly natural environment. There are few opportunities for challenge and risk and evidence of other users is prevalent. Motorized and non-motorized recreational opportunities are appropriate.

Rural (R) - area characterized by a substantially modified natural environment. Challenge and risk opportunities are not important and other users are readily evident. Motorized and non motorized recreational opportunities are appropriate.

Urban - areas characterized by high social interaction and significant modification of the natural environment such as city parks.

Recreation Visitor Day (RVD) -- Recreational use of National Forest System land that aggregates 12 hours. It may consist of one person for 12 hours, two people for 6 hours, or any combination.

Recovery plan -- A plan that outlines actions needed to recover and/or protect a species.

Reforestation -- The natural or artificial restocking of an area with trees.

Regeneration -- The actual seedlings and saplings existing in a stand; the renewal of a tree crop whether by natural or artificial means.

Regeneration cut -- Removal of trees with the intention of establishing a new crop of trees.

Relative stand density -- Measurement of stand density in mixed species stands that allows for variable tree sizes and species composition.

Removal cut (shelterwood cut) -- The last timber cut in a shelterwood regeneration that removes the trees that have provided seed and shade for the new stand.

Reserved and outstanding mineral rights -- Privately-owned rights to develop and extract subsurface minerals from National Forest lands.

Riparian areas -- Geographically delineated areas with distinctive resource values and characteristics that are comprised of the aquatic and riparian ecosystems, flood plains, and wetlands. They include all areas within a horizontal distance of 100 feet from the edge of perennial streams or other water bodies.

Riparian ecosystem -- A transition between the aquatic ecosystem and the adjacent terrestrial ecosystem that is identified by soil characteristics and distinctive vegetation communities that require free or unbound water. They extend away from the bank or shore of aquatic ecosystems to include lands with direct land-water interactions that may affect ecological structure, function and composition.

Road maintenance -- Expenditures in the minor restoration and upkeep of a road necessary to retain the road's approved traffic service level (FSM 7705).

Rock (mineral materials) pits - Areas utilized as sources of material for surfacing low standard roads. Also called stone pits, pits, or gravel pits.

Runoff -- That part of precipitation, as well as any other flow contributions, that appears in surface streams, either perennially or intermittently.

Salvage -- Dead or dying trees that occur in excess of those needed for wildlife, aesthetics or other purposes. These trees are harvested for production.

Scoping -- The process by which significant issues relating to a proposal are identified for environmental analysis. Scoping is an integral part of environmental analysis. Scoping includes eliciting public comments on the proposal, evaluating concerns and developing alternatives for consideration. Depending on the complexity and nature of the action, scoping varies from a brief consideration of a few pertinent factors in a proposed action that may be categorically excluded to full compliance with the Council of Environmental Quality direction for a proposed action that must be documented in an environmental impact statement.

Sediment -- Organic matter or soil that settles to the bottom of a liquid.

Selection harvest cut -- A system that removed trees individually in a scattered pattern from a large area each year.

Sensitive species -- Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by: significant current or predicted downward trends in population numbers or density; or significant current of predicted downward trends in habitat capability that would reduce a specie's existing distribution.

Shade tolerant -- A tree or other plant species having the capacity to grow without receiving direct sunlight.

Shelterwood cutting -- A cutting method used in even-aged management. It is the removal of a stand of trees through a series of cuttings designed to establish a new crop with seed and protection provided by a portion of the stand.

Shrub -- A plant with persistent woody stems and relatively low growth form; usually products several basal shoots as opposed to a single bole; differs from a tree by its low stature and non-arborescent form.

Silviculture -- The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.

Silvicultural system -- A planned process whereby a stand is tended, harvested and re-established. The system name is based on the number of age classes and/or the regeneration method used.

Site preparation -- A hand or mechanized manipulation of a site designed to enhance the success of regeneration. Treatment may include bedding, burning, chemical spraying, chopping, discing, drainage, raking, or scarifying. All treatments are designed to modify the soil, litter, and vegetation and to create microclimate conditions conducive to the establishment of desire species.

Skid trail -- Travel way used to drag or transport trees from the stump to a landing or road.

Slash -- Woody debris left after logging, pruning, thinning or brush cutting. It includes logs, chunks, bark, branches, stumps and broken small trees or brush.

Snag -- A standing dead tree from which the leaves and most of the branches have fallen.

Softwood -- A coniferous tree; trees belonging to the botanical group *gymnosperme*.

Soil compaction -- Compaction is a reduction of volume. This means, in soils, a reduction of pore space, since the solid particles are practically incompressible. Therefore, soil compaction is usually thought of as a decreased porosity concomitant with a increase in bulk density (Alexander 1985).

Soil displacement -- When soils are displaced from their original site, i.e., by rutting, gouging, scrapping, filling, etc. Displacement of soil can result in loosening and mixing of soil layers or the compacting of surface soils (Froehlich 1973 in Thompson 1997).

Soil disturbance -- An abrupt change in the chemical, biological, or physical characteristics as a direct result of the harvesting system (or any other physical activity) operating on the site (Standish *et al.,* in Thompson 1997).

Soil Group I – Well drained soils.

Soil Group II -- Moderately drained soils.

Soil Group III -- Poorly drained soils.

Soil profile -- A progression of distinct layers of soil beginning at the surface that has been altered by normal soil-firming processes such as leaching, oxidation and accretion.

Soil puddling - When soil moisture and physical disturbance is high enough that the soil liquefies and looses it structure.

Spatial feasibility -- The capacity of a management prescription to be practically implemented on the ground.

Species -- A fundamental category of plant or animal classification.

Stand (tree stand) -- A contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit.

Standard -- A principle requiring a specific level of attainment; a rule to measure against.

Stream -- A channel with a defined bed and banks that carries enough water flow at some time during the year to flush out leaves.

Subsoil -- The lower layer of soil surface in which roots normally grow.

Subsurface (mineral) rights -- Ownership of or right to develop or recover the oil, gas or minerals resources under the land surface.

Succession -- A series of dynamic changes by which organisms succeed one another through a series of plant community (seral) stages leading to potential natural community or climax.

Suitability -- The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses forgone. A unit of land may be suitable for a variety of individual or combined management practices.

Suitable timber lands -- Forest lands to be managed for timber production.

Surface rights -- Ownership of the surface of the land only; right to use the surface of the land on a regulated basis.

Surface water -- Rivers, lakes, ponds, streams and so forth that are located above ground.

Sustained yield of products and services -- The achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the National Forest without impairment of the productivity of the land.

Synergism -- The harmonious action of two agents producing an effect that neither could produce alone, or an effect that is greater than the total effects of each agent operating by itself.

Take (as used in the Biological Opinion) -- To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct.

Technical chemical or pesticide -- The pesticide as it is first manufactured by the company before formulation. It is usually almost pure.

Temporary road -- Roads associated with timber sale contracts not intended to be a part of the forest development transportation system and not necessary for resource management (FSM 7705).

Terms and Conditions (as used in the Biological Opinion) -- Set out specific methods by which reasonable and prudent measures are to be accomplished

Thinning -- A cultural treatment made to reduce stand density of trees primarily to improve growth, enhance forest health, or to recover potential mortality.

Threatened Specie -- Any specie which is likely to become endangered within the foreseeable future and which has been designated in the Federal Register as a threatened specie.

Tiering -- Incorporating information contained in an environmental impact statement by reference to subsequent environmental documents.

Timber production -- The purposeful growing, tending, harvesting and regeneration of regulated crops of trees to be cut into logs, bolts, or other round section for industrial or consumer use. Forest purposes of this document, the term *timber production* does not include production of fuel wood.

Timber stand improvement (TSI) -- Usually related to activities conducted in young stands of timber to improve growth rate and form of the remaining trees. Examples include thinning, pruning, fertilization and control of undesirable vegetation.

USDA -- U.S. Department of Agriculture.

USDA-FS -- U.S. Department of Agriculture, Forest Service.

Understory (vegetation) -- Shade-tolerant plants growing below the canopy of other plants. Usually refers to grasses, forbs and low shrubs under a tree or brush canopy.

Uneven-aged management -- Methods of regenerating a forest stand and maintaining an uneven-aged structure by removing some trees in all size classes either singly, in small groups, or in strips.

Upland -- The higher ground of a region, in contract with a valley, plain or other low-lying land.

Upland hardwoods -- Deciduous forest that occurs on side slopes and ridge tops (not in floodplains or wetlands).

Variety class -- A particular level of visual variety or diversity of landscape character.

Distinctive (Class A) - Refers to unusual and/or outstanding landscape varieties that stand out from the common features in the character type.

Common (Class B) - Refers to prevalent, usual or widespread landscape variety within a character type. It also refers to ordinary or undistinguished visual variety.

Minimal (Class C) - Refers to little or no visual variety in the landscape; monotonous or below average compared to the common features in the character type.

Veliger -- The larval, planktonic stage of the zebra mussel which floats freely in water up to about 12 days before making attachment to a hard substrate.

Vertical diversity -- The diversity in an area that results from the complexity of the above-ground structure of the vegetation; the more tiers of vegetation and/or the more diverse the species composition, the higher the degree of vertical diversity.

Visual distance zone - Areas of landscapes denoted by specific distances from the observer; used as a frame or reference in which to discuss landscape characteristics or human activities.

Foreground - That part of a scene, landscape, etc. which is nearest to the viewer and in which detail is evident, usually up to one-quarter mile from the viewer.

Middleground - That part of a scene or landscape that extends from the foreground zone to ½ to 2 miles from the observer. Texture is discernible at that distance.

Background - The distance part of a landscape; surroundings, especially those behind something, providing harmony and contrast; area located from two miles to infinity from the viewer.

Visual resource -- The composite of basic terrain, geologic features, water features, vegetative patterns and land-use effect that typify a land unit and influence the visual appeal the unit may have for visitors.

Volant -- Capable of flying.

Watershed -- An area of land with a single drainage network.

Wetlands -- Those areas that are inundated by surface or ground water with a frequency sufficient to support, and under normal circumstances do or would support, a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats and vernal ponds.

Wilderness Area -- A Congressionally-designated tract of Federal land retaining its primeval character and influence without permanent improvements or human habitation. Management is intended to retain these characteristics.

Wildlife Habitat -- The sum total of environmental conditions of a specific place occupied by a wildlife species or a population of such species.

Wildlife structure -- A site-specific improvement of a wildlife or fish habitat, for example spring development or a dugout to provide water, log placement in a stream for fish cover and pool creation, nest box for bird nesting, etc.

Zebra mussel -- An exotic (non-native) freshwater mussel introduced into the Great Lakes from Europe.

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