SUMMARY – EAST SIDE PROJECT FINAL ENVIRONMENTAL IMPACT STATEMENT

Project Overview

The East Side project area is located on both the Bradford and Marienville Districts of the Allegheny National Forest (ANF). The zone of mortality encompasses approximately 139,990 acres of federal land and is located primarily on the eastern portion of the ANF. The Proposed Action, distributed to the public in April of 1998, described proposed management activities on over 8,000 acres. Reforestation and understory restoration activities were proposed to restore the forested ecosystem in areas of the East Side project hardest hit by decline and mortality. Other activities include the following: harvesting of forest products, watershed protection, transportation system improvement and development, and wildlife habitat enhancement. Ecosystem restoration and other management activities were proposed to move the East Side project area from the Existing Condition (EC) towards the Desired Future Condition (DFC) as developed from the Allegheny National Forest Land and Resource Management Plan, 1986, as amended.

Background

From 1991 through 1996, a series of defoliations caused by elm spanworm and forest tent caterpillar occurred over a wide area of the northern tier of Pennsylvania. During that six-year period, a substantial portion of the East Side project area was repeatedly defoliated. Close to one-half of the area has been defoliated two or more times, and almost one-quarter of it has suffered three or more defoliations. A series of droughts also occurred in 1988, 1991, and 1995. These repetitive stresses weakened the trees and made them more susceptible to attack by secondary pathogens that actually killed the trees. By 1994, Forest Service personnel began to observe sizeable areas of tree mortality and decline. Sugar and red maples, American beech, birch, and white ash were the species that were most affected. The amount of mortality found within individual stands depended upon the concentration of these species.

ANF land managers became concerned about the rapid change in forest conditions observed in certain areas of the ANF. A substantial number of stands that had been moderately- or well-stocked with healthy trees subsequently contained numerous dead or declining trees. Furthermore, the ground vegetation components of these ecosystems indicated the forest most likely would not be resilient or self-renewing. Few tree seedlings were present on the forest floor, and abundant vegetation existed which would severely limit additional seedling development. Large, overstory, seed producing trees were much less abundant or less evenly dispersed in these stands than required to produce adequate tree seedlings. Finally, deer were browsing heavily on most of the existing or newly developing seedlings, preventing them from growing tall enough to replace trees that had declined or died. The combination of all of these concerns prompted ANF personnel to consider management actions that would help renew these forest ecosystems and sustain their functional integrity to help promote healthy watersheds on the ANF.

In 1994 and 1995, ANF personnel completed a series of analyses to assess tree mortality/decline, ecosystem sustainability, and to determine vegetative treatments needed to promote healthy forest ecosystems on selected portions of the ANF. The Mortality I project (Environmental Assessment of Tree Mortality and Ecosystem Sustainability on the Allegheny National Forest, June 1995) focused on areas which, in late 1994, had the most severe tree mortality and decline. It closely examined over 7900 acres and identified ecosystem management actions to treat the most severe mortality on 5,203 acres. These treatments were approved and most have been implemented.

In late 1995, the Mortality II project was initiated as a continuation of these analyses. It addressed ecosystem sustainability, harvesting, and reforestation concerns on additional areas within the zone of mortality. The Decision and Environmental Assessment were litigated. The outcome of the litigation required the Forest Service to prepare an Environmental Impact Statement (EIS). On October 15, 1997, Judge William L. Standish ordered that "On remand, defendants shall reconsider their determination that

even-aged management techniques proposed in the Mortality II project for Management Area 3 meet the 'optimality' and 'appropriateness' requirements set forth in 16 U.S.C." The East Side EIS responds to this requirement.

The East Side EIS project analysis also covers four previously identified projects within its boundary that were in various stages of development when the East Side project was initiated. Although the projects were not initiated entirely as a result of mortality and decline, it was a primary factor in their development. As a result, it was decided to combine the Thomas Rock, Coal Mine, Rocket John, and Forest Road 446 projects with the Mortality II project to create the East Side project proposal.

Purpose And Need

Purpose of the Proposal

The fundamental purpose of any Forest Service project is to propose actions which move the area from the existing condition (EC) towards the desired future condition (DFC) as developed from the Allegheny National Forest Land and Resource Management Plan (Forest Plan). This includes implementing the Forest Service natural resource agenda at the local project scale (East Side in this case), striving to maintain and restore healthy and resilient watersheds and ecosystems. Inherent in this process is monitoring land uses, management activities, and naturally occurring ecosystem disturbances, such as those which have occurred in the East Side Project area. Moving towards the DFC for local ecosystems and watersheds can involve changing vegetative composition, age distribution, forest cover type distributions as well as other resource management activities.

In all of the management areas within the East Side project, there is an inherent objective to maintain healthy, resilient, forest ecosystems capable of supplying the vegetation setting necessary to provide the DFC, land uses, watershed functions, and outputs necessary to achieve the purposes of each MA. This includes maintaining healthy well-stocked forest vegetation.

The East Side Project Area contains Management Areas (MAs) 2.0 (1%), 3.0 (83%), 6.1 (8%), and 6.2, 7, and 8 (collectively 8%). There are no vegetative management activities proposed in MAs 6.2 or 7, so there will be no further discussion of those Management Areas. A complete description of the goals and objectives for MA 2.0 are described in the Forest Plan on pages 4-70 through 4-82, for MA 3.0 on pages 4-82 through 4-96, for MA 6.1 on pages 4-110 through 4-124, for MA 6.1 on pages 4-110 through 4-124, and for MA 8.0 on pages 4-169 through 4-179.

It should be noted that the tables that display road activities in various sections of this document include MA 6.2. The Forest Plan allows reconstruction on those roads that serve as boundaries between MA 6.2 and other MAs. Therefore, MA 6.2 is listed in the road activity tables.

There are minor amounts of treatments proposed by the Northeastern Research Station (USDA Forest Service, Irvine, PA) in MA 8.0. See the Descriptions of Alternatives Considered in Detail section of Chapter 2 for an explanation of the proposals.

Need for the Proposal

An Interdisciplinary (ID) Team of foresters, wildlife biologists, recreation planners, transportation planners, archaeologists, fisheries biologists, landscape architects, and soil scientists have surveyed and evaluated the East Side planning area to propose management solutions to restore the forested ecosystem in the East Side project area. Such activities would move the project area towards the DFC as described in the Forest Plan. The team identified needs and opportunities that would change or enhance East Side present conditions and would move the area toward the desired future condition.

The following list describes the "needs for action" and opportunities identified for the East Side area that would meet the purpose of implementing the Forest Plan by restoring the forested ecosystem and moving the area towards the DFC.

1. **Initiate reforestation treatments to restore the declining forest ecosystem –**

   As described in the Background Section (p. 1), the vegetation within the East Side project area has undergone considerable change since 1991, primarily due to extensive defoliation, drought, and subsequent decline and/or mortality. As a result, a number of stands are no longer in a healthy, productive, or resilient condition and are not capable of meeting long-term Forest Plan objectives. There is a need to begin a series of reforestation treatments that will restore these stands and their respective watersheds to a healthier condition. In some cases, the stands have deteriorated to the point where they no longer function as forested ecosystems, and reforestation activities are necessary to establish a new stand of trees.

2. **Establish tree seedlings to restore tree regeneration or replacement and to improve the horizontal and vertical diversity in the ecosystem –**

   Horizontal and vertical diversity of the forested ecosystem has been significantly altered at the landscape level as a result of deer population densities in relation to carrying capacity. Under ideal conditions, the forest ecosystem would be composed of the following: a low layer (understory) of native herbaceous plants, shrubs, and tree seedlings; an intermediate layer of shrubs and young trees; and an overstory of dominant and co-dominant trees. Because of browsing by deer, the understory is often composed of ferns, grass, striped maple, and beech brush. The shrub layer, new tree seedlings, and many herbaceous plants are missing in the landscape ecosystem. On some sites, there is a need to restore the understory and to improve the horizontal and vertical diversity in the ecosystem. Tree seedlings can be established and understory conditions restored by one or more of the following actions: initiating reforestation activities (fertilization, herbicide application, fencing) that mitigate the effects of long-standing, high deer populations; mechanical and manual site preparation (to stimulate natural regeneration); and artificial regeneration work (planting seedlings). Once seedlings are established they can be encouraged to grow either by a partial or full removal of the overstory. In many of these stands there is also an opportunity to salvage dead, dying, or degrading trees.

3. **Enhance health and vigor of forested stands by regulating stocking and species composition -**

   Areas with stocking levels greater than 80% are producing tree to tree competition for space and nutrients. This creates stress on individual trees. Reduction of stocking levels through harvesting of dead and dying trees, as well as some trees unaffected by mortality and decline, will reduce future stress and possible decline and mortality of residual trees that are needed to maintain continuous forest cover (Marquis et al 1992 p 10; Marquis ed.1994 pp 247-251)[1].

   Within the project area there are also some young stands in need of intermediate treatments to improve stocking and species diversity. This work can be accomplished most efficiently if done concurrently with the needed reforestation treatments in the project area. This will move the area toward the objective of providing a sustained yield of high quality Allegheny Hardwoods through even-age management.

4. **Sustainable forest management** –

   The primary purpose of MA 3.0 is to provide a sustained yield of high quality hardwood sawtimber and to provide age- and size-class diversity for wildlife habitat. It is necessary to start reforestation treatments and regeneration harvests in a portion of mature or declining stands now to promote the sustainable delivery of forest products in MA 3.0. This will create the age-class distribution levels described in the DFC for MA 3.0 and will provide an even flow of forest products over the long-term. Management activities could include regeneration/reforestation treatments such as two-aged harvesting, shelterwood harvest sequences, and final harvests, with some implemented through an adaptive management approach. Most of the stands proposed for regeneration contain substantial tree mortality/decline or are at risk of further decline if new stress events occur.

[1] For full citations see East Side FEIS.

5. **Supply forest products to meet public demand and to contribute to the economic vitality of local communities -**

   Congress has directed the Forest Service to provide forest products within the capability of the land and individual Forest Plans (16USC475, 16USC531). The ANF Forest Plan allocates land for the sustainable production of forest products. People's demand for hardwood and other forest products (furniture, paper, fiber and construction materials) continues to be high. This supports the need to supply this renewable resource. There is opportunity in this project to supply large amounts of forest products through salvage and green harvests (within the capability of the land) that provide a means to satisfy the public's demand for wood and also contribute to the economic vitality of local communities. Some of the stands within the project area have sustained only partial or moderate tree mortality or decline, while in others the decline/mortality is much more substantial. In both instances the affected trees would lose substantial value as forest products if harvest is not timely.

6. **Transportation system development to provide access and to maintain water quality -**

   There is a need to provide an adequate transportation system for both the short- and long-term access for the management of the National Forest lands within the East Side project area. Investments to the existing Forest Service road system are needed to maintain or improve the safety or operating efficiency of roads. Investments in new roads are needed in areas that do not currently have adequate access and there is a need to initiate vegetative treatments.

   Poorly maintained roads, improperly located roads, or roads no longer needed can have adverse impacts on watersheds. There is a need to ensure that the transportation system within the project area (new and existing) will not degrade water quality. Opportunities exist to maintain and enhance water quality. This could be accomplished by eliminating unnecessary roads and by surfacing roads within 300 feet of streams with limestone to reduce the possibility of sedimentation.

7. **Restore wildlife habitat -**

   Many of the stands in the East side project area have declined to such an extent that they have less than half of the normal levels of tree stocking. In some areas there is a lack of canopy closure, and true forested habitat is no longer provided. The natural replacement of this forest cover is inhibited by long standing, high deer populations. Restoring forest ecosystems is also an opportunity to enhance wildlife habitat through vegetative management techniques and to develop habitat structure. Habitat improvement in declining areas will include site preparation and planting of species that benefit wildlife and will occur concurrently with habitat improvement activities in areas unaffected by mortality and decline. There are also opportunities to improve wildlife habitat through additional activities such as: construction of water holes, catch basins and fish structures, seeding and planting, aspen regeneration, and conifer release.

Public Involvement and Issue Development

Scoping

The Interdisciplinary Team conducted an analysis in this project area for the purpose of implementing the Forest Plan. During this analysis process, resource specialists from several disciplines inventoried and analyzed information concerning the proposed project area. Opportunities were identified as a result of this analysis process that would help move from the Existing Condition toward the Desired Future Condition. Issues that arose during the process became part of the Purpose and Need and were incorporated into the Proposed Action. On April 23, 1998 a scoping letter was sent to all those people and organizations that had requested information concerning proposed management activities. A Notice of Intent (NOI) to prepare an environmental impact statement was published in the Federal Register at the same time. The scoping letter presented the Purpose and Need, Proposed Action and invited comments from members of the public to help identify issues that they might have concerning the Proposed Action.

Issues Used to Formulate Alternatives

The purpose of soliciting comments during the scoping period is to determine whether there are any unresolved issues that affect a proposed action. Many issues and concerns originating from public comments and agency concerns were identified for analysis. For a more detailed discussion of the disposition of comments received during the scoping period, please see Appendix A of the FEIS. The comments that were received during scoping were evaluated using the following criteria:

1. Were they issues that should be addressed at a higher level?
2. Have they already been addressed at a higher level?
3. Can they be resolved by applying Forest Plan Standards and Guidelines?
4. Could they be resolved by modifying the Proposed Action?

Issues that remain after applying the above criteria are considered "unresolved" and are used to formulate alternatives to the Proposed Action. They will also be used in the analysis of the alternatives. The following issues were identified through the scoping process.

Issue: What level of timber harvest should occur in the East Side Project Area?

There is a concern over the amount of timber harvesting, if any, that should occur in conjunction with other management activities. Numerous comments were received both in favor of and in opposition to the commercial harvesting of trees within the project area. Comments proposed varying levels of management that ranged from no harvest at all to expanding the amount of harvesting in the Proposed Action to include more areas. This issue can be addressed by developing alternatives that propose different levels of timber harvest.

Measures used to evaluate alternatives include the following:

- Total acres of timber harvesting;
- Transportation system activities necessary to complete harvesting activities,
- Long-term sustainability of the forest resource; and
- Volume and value of timber harvested.

Issue: Should only dead, dying, and damaged trees be salvage harvested?

There are concerns about the appropriate amounts of timber harvesting in response to tree mortality and decline. Treatments could be limited to the removal of only dead, dying, and damaged trees.

Measures used to evaluate alternatives include the following:

- Percent of potential dead and dying material salvaged and utilized

Issue: Should herbicides and other reforestation treatments be used to help sustain forest cover in declining forest ecosystems?

There is a concern over the use of herbicides and the amount of other reforestation treatments in the project area. Stand regeneration prescriptions in the Proposed Action include the application of herbicides to remove vegetation that inhibits the establishment and growth of desired tree seedlings. There were comments received in favor of and in opposition to the use of herbicides. This issue can be addressed by developing alternatives to the Proposed Action that do or do not propose the use of herbicides or other reforestation treatments.

Measures used to evaluate alternatives include the following:

- Reforestation activity acres,
- Potential vegetation response to treatment versus the response to doing no treatment, and
- Potential risks to human health and wildlife from using herbicides.

Issue: What level of construction of new roads and reconstruction of existing roads should be implemented in the project area?

Comments were received that urged that no new roads be constructed in the project area. Other commentors were concerned about the amount of reconstruction of roads called for in the Proposed Action. Other comments agreed with the amount of road activity in the Proposed Action. This issue can be addressed by developing alternatives to the Proposed Action that propose varying quantities of road construction and reconstruction.

Measures used to evaluate alternatives include the following:

- Road density;
- Existing road corridor added to the FS system;
- Miles of construction, reconstruction, decommissioning; and
- Number of stone pits.

Issue: Should even-aged management or uneven-aged management silvicultural systems be used in the project area?

The Forest Plan gives direction regarding the primary silvicultural system to be used in each Management Area. Forest Plan direction is based on considerable analysis of trade-offs between these systems. In MA 2.0, uneven-aged management will be the featured silvicultural system. MA 3.0 features even-aged management with uneven-aged management being an option for inclusions such as riparian areas, wet soils, or visually sensitive areas. In MA 6.1, even-aged and uneven-aged silvicultural systems will be used to achieve wildlife and recreation management objectives. In MA 8.0, the silvicultural systems and associated activities will be specified in each research project.

As a result of the litigation discussed in the Background section, the Order, signed by United States District Judge William L. Standish on October 15, 1997, contains the following direction: "On remand, defendants shall reconsider their determination that the even-aged management techniques proposed in the Mortality II Project for Management Area 3 meet the ‘optimality’ and ‘appropriateness’ requirements set forth in 16 U.S.C."

Comments were received that urged more and, in some cases, exclusive use of uneven-aged management techniques in the project area. Other comments agreed with the use of even-aged management as called for in the majority of the stands scheduled for treatment in the Proposed Action.

There is a concern that uneven-aged management techniques will not result in a sustainable forest condition in MA 3.0 stands that are currently being managed in an even-aged manner.

This issue can be addressed by developing alternatives that propose both even-aged and uneven-aged management practices.

Measures used to evaluate alternatives include the following:

- Number of acres proposed for even-aged and uneven-aged management;
- Net Cash flow;
- Acres where regeneration success is anticipated based on historical ANF tree seedling development patterns;
- Acres of future moderately to well-stocked forest cover, and
- Future stand value.

Relationship To Other Documents

This analysis is tiered to the following documents:

- The Allegheny National Forest Land and Resource Management Plan, as amended, 1986 and Final Environmental Impact Statement
- The Understory Vegetative Management Final Environmental Impact Statement and Record of Decision (3/91)
- Vegetation Management on Electric Utility Rights-of-Way Final Environmental Impact Statement and Record of Decision (Allegheny National Forest, 1996)

The following documents are incorporated by reference:

- The Allegheny National Forest Monitoring and Evaluation Reports from FY 1987 to FY 1998 – These reports evaluate the monitoring and evaluation of Forest Plan implementation to determine how well standards and guidelines have been applied.
- Environmental Assessment of Tree Mortality and Ecosystem Sustainability on the Allegheny National Forest (6/95), also referred to as Mortality I – Approved 5,203 acres of treatments to restore the ecosystem on the most severe mortality on over 7,000 acres within the zone of mortality.
- The following Environmental Assessments are documents that have approved past, present, or future activities within the zone of mortality:

Hoffman Farm 1/30/95	Lame Skunk 6/21/91	Turnup Run 4/2/96
Eagle Mills 5/22/96	Mother Nature 3/12/93	Wintergreen 12/4/95
Wolf Run Salvage 5/9/95	Deer Fence 6/12/92	Duck Ponds 9/18/91
Songbird 9/30/91	Beaver Dam 6/20/91	Swede Hill 8/13/90
Carlo 1/8/91	Greely Farm 8/19/94	Gumdrop 11/12/92
Derringer 9/30/91	FR165 3/17/93	Dalmation 2/20/91
Three Mile 6/24/91	Gladwater 7/1/93	
Porter's Prize 5/19/95	Coon Creek 3/9/94	

- The East Side Project File – Contains analyses and documentation used in the East Side project.

Cooperating Agencies

U.S. Department of Interior, Fish and Wildlife Service

The Forest Service works in close cooperation with the US Department of the Interior Fish and Wildlife Service (USDI FWS). In December 1998, the ANF entered into formal consultation with the USDI FWS

with regard to the potential effects of the implementation of activities as outlined in Forest Plan on five federally threatened and endangered species. Formal consultation was concluded on June 1, 1999, when the USDI FWS issued their Biological Opinion (BO). All management activities proposed within the East Side Project are subject to the terms and conditions of the BO. The Forest Plan was amended on July 28, 2000 to incorporate the terms and conditions of the BO.

U.S. Department of Interior, National Park Service

The North Country Trail (NCT) is a National Scenic Trail. The National Park Service coordinates the management of the trail. In cooperation with public and private interests, the National Park Service completed a Comprehensive Plan for Management and Use of the NCT in September 1982. The National Park Service is responsible at the federal level for carrying out the provisions of the National Trails System Act (10/2/68) as they relate to the NCT by coordinating, guiding, and assisting the efforts of others to acquire, develop, operate, protect and maintain the Trail in accordance with the comprehensive plan. Because significant portions of the Trail traverse lands under the separate jurisdictions of the National Park Service, Forest Service, and North Country Trail Association, these three parties have entered into a Memorandum of Understanding for administering, operating, and maintaining the NCT. The Forest Plan incorporated management strategies for the NCT from this Comprehensive Plan. The Forest Service advises the National Park Service and North Country Trail Association when they are planning any management involving the NCT.

On August 16, 2000, Bill Menke (NPS manager for the NCT) reviewed portions of the East Side project area.

Decision To Be Made

This Environmental Impact Statement evaluates site-specific management proposals, considers alternatives, and analyzes the effects of the activities proposed in these alternatives. It forms the basis for the deciding officer, the Forest Supervisor of the Allegheny National Forest to determine:

1. Whether or not the proposed activities and alternatives are responsive to the issues, are consistent with Forest Plan direction, meet the purpose and need as described for the East Side Project and are consistent with other related laws and regulations directing National Forest management activities.

2. Which actions, if any, to approve.

3. Whether or not the information in this analysis is sufficient to implement proposed activities.

Formulation of Alternatives

The Interdisciplinary Team looked at a wide range of management options (alternatives) for areas within the zone of mortality and developed alternatives based upon the unresolved issues that arose during scoping.

Public comments on the Proposed Action were received in May of 1998. After agency and public comments were analyzed, alternatives were developed by the ID Team to respond to the unresolved issues described in on pp. 5-7. Alternatives were developed through consideration of management needs and opportunities as determined by on-the-ground investigations, agency concerns, and public input received through the scoping process. The alternatives, both those considered in detail and those eliminated from further study, display a range of options that: could be implemented to manage the East Side planning area, represent different levels of management, and provide a framework to analyze the unresolved issues. Alternatives eliminated from detailed study, including some detailed alternatives submitted by the public, are also included.

The development of alternatives was guided by Forest Plan Standards and Guidelines and the management area direction for MA 2.0, MA 3.0 and MA 6.1. Site-specific mitigation measures developed for each alternative are listed in Appendix D of the FEIS.

In determining what activities should occur on the analyzed areas, the ID team first examined site-specific and local watershed considerations, such as soils, severity of mortality, understory composition, wildlife habitat, etc. Next, the team looked at landscape considerations: the spatial pattern of existing and proposed harvested units, age-class distribution, and patch size.

The majority of the stands within the East Side project area were not proposed for treatment. Even in the most aggressive alternative considered in detail, only 6 percent of the project area will be affected. The amount of the project area left untreated by proposals in the East Side project varies, based on the intent of each alternative, from a low of 94 percent in Alternative 1 to a high of 100 percent in Alternative 5 (no action). The following criteria were used to help identify potential stands for treatment:

- The stand meets the initial prescription criteria for a treatment, and
- It is economically feasible to salvage the dead and dying trees, and
- It is environmentally feasible to salvage, and
- Other resource concerns do not preclude management, including the salvaging dead and dying trees, or
- The stand is within the Thomas Rock, Coal Mine, Rocket John, or Forest Road 446 projects.

Treatments within these latter four projects were included in the East Side Project because some of them were designed to deal with tree mortality and decline, and the projects were within the East Side project area. Other treatments, not associated with tree mortality and decline, were included in East Side in order to maintain the initial integrity of the projects from which they originated.

The tables displaying the lists of proposed activities in each alternative contain various types of silvicultural treatments, wildlife treatments, and road system activities. Detailed descriptions of these activities can be found in Appendix B, the Vegetation Report; Appendix C, the Biological Assessment; and Chapter 3 of the FEIS; or various professional texts and handbooks. For ease in interpreting these tables, the following brief descriptions are provided:

Vegetation

Green versus Salvage

Green - The term ‘green’ is used in reference to the following conditions:

- Thinning prescriptions - more than 50% of the volume to be harvested is made up of healthy trees.

- Regeneration harvests - (both even-aged and uneven-aged), healthy relative stand density is greater than 40% prior to treatment.

Salvage – The term ‘salvage’ is used in reference to the following conditions:

- Thinning prescriptions - more than 50% of the volume to be harvested is made up of dead, dying or damaged trees.

- Regeneration harvests (both even-aged and uneven-aged) - healthy relative stand density is less than 40% prior to treatment.

Regeneration Harvests

Even-aged Regeneration Harvests

Even-aged regeneration harvest prescriptions include treatments that occur in stands that are severely impacted by tree mortality and decline, as well as healthier stands. Reforestation treatments such as herbicide application, site preparation for natural regeneration, fertilization, area fencing, and individual tree fencing and planting are prescribed based upon site specific needs within a stand. The combination of timber harvest and reforestation activity results in the restoration and maintenance of forested stands, the establishment of vertical and horizontal vegetative diversity, the production of wood products, and the establishment of age class diversity across the landscape. Even-aged regeneration harvests are proposed only in MA 3.0 and MA 6.1. These treatments include: Clearcut, Shelterwood seed cut, Shelterwood removal cut (delay), Prep cut / Two-aged, and Two-Aged.

Uneven-aged Harvests

Uneven-aged harvest prescriptions include treatments (implemented through adaptive management) that occur in stands that are severely impacted by tree mortality and decline, as well as in healthier stands. Reforestation treatments such as herbicide application, site preparation for natural regeneration, area fencing, and individual tree fencing and planting are prescribed based upon site-specific needs within a stand. The combination of timber harvest and reforestation activity should result in the restoration and maintenance of forested stands, the establishment of vertical and horizontal vegetative diversity, the production of forest products, and the establishment of age-class diversity within individual stands. However, on the ANF reforestation success achieved through uneven-aged management has been marginal Uneven-aged regeneration harvests are proposed as an adaptive management technique in MAs 2.0 and 3.0. According to the Forest Plan, in MA 2.0 uneven-aged management is the featured silvicultural system, and in MA 3.0 it may be considered on riparian areas, visually sensitive areas, and on wet soils. In this project, it is also considered for use on sites proposed for even-aged management that have the biological characteristics that could potentially sustain its use. These treatments include: Selection, Group Selection, and Transition cut.

Intermediate Harvests - Even-aged Thinning Harvests

Even-aged thinning prescriptions include treatments that occur in stands that are lightly to moderately impacted by tree mortality and decline, as well as healthier stands where stocking levels are high. These timber harvest activities are designed to maintain the health and vigor of stands and to provide wood products to meet social demand. The objective of treatments will be to establish even-aged structure in these stands and to produce wood products. Even-aged thinning harvests are proposed only in MA 3.0. These treatments include: Commercial Thinning (green), Commercial Thinning (salvage), and Modified Salvage.

Reforestation Only

Reforestation treatments with no associated timber harvest occur in stands that are severely impacted by tree mortality and decline and where no opportunity for commercial timber harvest activity exists. Reforestation treatments such as herbicide application, site preparation for natural regeneration, fertilization, area fencing and individual tree fencing, and planting are prescribed based upon site specific needs within a stand. The application of reforestation treatments in stands that have been severely impacted by mortality results in the restoration of forested stands, the establishment of vertical and horizontal vegetative diversity, and the establishment of age class diversity across the landscape. “Reforestation only” treatments occur in MA 3.0 and MA 6.1.

Reforestation Treatments

Reforestation treatments are proposed in many of the stands with timber harvest treatments and include: Herbicide application, Site preparation, Fertilization, Individual Tree or Area Fencing, Planting of Tree and Shrub Species,

Transportation

These treatments include: New Road Construction, Road Reconstruction (Realignment, Betterment), Restoration, Long Skidding, Temporary Roads, and Road Decommissioning

Wildlife Treatments

These are proposals designed to maintain or enhance wildlife habitat. They include the following activities: wildlife and fish habitat improvement, fruit tree pruning and release, grass/forb seeding, and non-forest shrub and conifer planting and fencing.

Descriptions of Alternatives Considered in Detail

See Table 1 for the amounts of proposed activities for each of the alternatives.

Kane Experimental Forest Proposals

The staff at the Forestry Sciences Laboratory of the Northeastern Forest Experiment Station at Irvine conducts research projects on the Kane Experimental Forest (KEF). They also use their research plots for natural resource training. The KEF falls within the East Side project boundary and has experienced some of the same insect, disease, decline, and mortality problems as the rest of the project area (zone of mortality). The decline and mortality in several of the training plots have changed individual stand conditions to the point where the plots can no longer be used for their original, intended purpose. The staff at Irvine is proposing to use these stands for research purposes and as demonstration areas for treatment responses to mortality and decline.

The KEF is MA 8.0. The primary objective of the KEF is to provide an area where research projects will generally relate to forest management problems and opportunities in the northeast. The Forestry Sciences Lab is, therefore, proposing the treatments for training and research purposes. These treatments are proposed for all action alternatives.

➢ *Alternative 1 (Proposed Action)*

Alternative 1 proposes reforestation and timber harvesting activities that will promote forest ecosystem restoration in response to changes in vegetation that have occurred as a result of light to severe mortality and decline. This alternative initiates salvage regeneration harvesting and reforestation prescriptions in areas of severe mortality. It proposes salvage thinnings in areas of light to moderate mortality. It also proposes only reforestation activity in stands that are severely impacted by mortality but no longer have commercially viable harvest options. Vegetation is managed primarily by using even-aged systems in MA 3.0 and 6.1, and uneven-aged systems in MA 2.0, per Forest Plan direction. Alternative 1 also proposes vegetative management prescriptions and wildlife habitat enhancement activities that meet Forest Plan objectives for MAs 2.0 and 3.0 in stands that are not impacted by mortality. Alternative 1 proposes transportation system management that provides access to support timber harvest, reforestation and wildlife habitat activities.

➢ *Alternative 2*

Alternative 2 was developed in response to the issue, “Should only dead, dying, and damaged trees be salvage harvested?” In addition, no reforestation treatments are proposed. The goal of this alternative is to utilize wood fiber and sawtimber whose economic value would be lost if not harvested within the next 5-10 years. Alternative 2 proposes to remove (salvage) the dead and dying trees where salvage harvesting is economically feasible. Harvesting only dead and dying trees is not intended to achieve either an even-aged or uneven-aged structure.

➢ *Alternative 3*

Alternative 3 was developed primarily in response to the issue, "What level of construction of new roads and reconstruction of existing roads should be implemented in the project area?" Otherwise it responds to the same issues as Alternative 1. Alternative 3 includes all of the treatment activities in the proposed action (Alternative 1) that could be feasibly accomplished without the construction of additional roads or major reconstruction of existing roads. Road maintenance and restoration activities are proposed in Alternative 3. Harvest activities included in this alternative are those designed to treat tree mortality and decline conditions as well as activities designed to achieve multiple-use objectives under healthy stand conditions. Feasibility varies with the commercial value of the harvest material, site conditions, and distance from the existing transportation facility.

Alternative 3 is similar to Alternative 1 in that it proposes the following:

1. Proposes to restore forested ecosystems by addressing changes in vegetation that have occurred as a result of light to severe mortality;

2. Initiates regeneration harvesting in stands with severe mortality;

3. Proposes salvage harvesting in stands with light to moderate mortality;

4. Implements vegetative management prescriptions (timber harvest) in stands that are not impacted by tree mortality and decline;

5. Accomplishes wildlife habitat enhancement activities that meet Forest Plan objectives; and

6. Initiates reforestation treatments in stands suffering from severe tree decline/mortality.

Alternative 3 differs from Alternative 1 by eliminating all activities that cannot be completed without road construction or major reconstruction. In low stocked areas where regeneration harvest has been dropped, reforestation activities would still be completed through adaptive management and would be monitored to determine the impact of the residual large trees on successful seedling development and growth.

➢ *Alternative 4*

Alternative 4 was developed primarily in response to the issue, "Should even-aged management or uneven-aged management silvicultural systems be used in the project area?" The goal of Alternative 4 is to achieve reforestation objectives and to complete salvage harvesting activities through uneven-aged treatments where they are reasonably, economically and biologically feasible. This includes taking a careful look at reasonably feasible uneven-aged treatments within all stands proposed for harvesting activities in Alternative 1. Reforestation treatments such as herbicide application, site preparation for natural regeneration, area fencing and individual tree fencing, and planting are prescribed based upon site specific needs within a stand. Table 22 in Appendix F of the FEIS lists the present condition of the stands considered in the East Side project proposal. Table 22 contains a column that evaluates the regeneration potential for uneven-aged management for each stand.

Where uneven-aged treatments are not feasible but commercial salvage opportunities exist, salvage harvest treatments are proposed that remove only dead and dying trees. In those stands where the mortality is severe, reforestation treatments implemented through adaptive management are also proposed. The adaptive management would be designed to monitor the impact of the residual large trees on seedling development and growth. In this alternative, harvesting only dead and dying trees is not intended to achieve either an even-aged or an uneven-aged structure. "Reforestation only" treatments are proposed in stands where severe mortality has occurred, where commercially operable sale potential does not exist, and where uneven-aged management is not biologically feasible.

➢ *Alternative 5: No New Federal Action*

Alternative 5 proposes that ecological processes control vegetative development within the East Side project area. No new reforestation/revegetation or harvesting activities would occur as a result of the East Side project. Activities near or within affected areas that have already been approved by past environmental assessments (see p.7) will still occur.

This alternative provides a baseline (reference point) against which to describe the environmental effects of the action alternatives. This is a viable alternative and responds to the concerns of those who want no management activities to take place (e.g., no timber harvest, additional roads, herbicide application, fencing, etc.).

Alternatives Considered But Eliminated From Detailed Study

There were additional alternatives considered by the ID Team that were eliminated from detailed study as fully developed alternatives. These alternatives were either suggested by the public, some in substantial detail, or were suggested by the ID Team during the analysis process. This section provides the rationale for not considering them as fully developed alternatives. The public submitted three detailed alternatives during the scoping phase of the project. They are discussed at the end of this section and are identified as Public Alternatives 1–3. In addition, three less detailed public alternatives are considered under the uneven aged management subheading.

Vegetation Management

There were numerous combinations of timber harvest and reforestation practices that could have been developed for this project in response to issues. As described on page 3 (Need for Proposal), one of the primary needs for action is to respond to the tree mortality and decline that is taking place within this project. Both the public and the ID Team presented many scenarios that the ID Team considered. Initially, the ID team considered seven different combinations of timber harvest and reforestation practices. The analysis of effects for the five alternatives considered in detail provides the Deciding Officer with information representing a wide range of response (high levels of harvest to low or no levels of harvest, in combination with various reforestation treatments for stands impacted by severe mortality, or no reforestation treatments for such stands). Additional combinations of harvest/reforestation that were considered but eliminated from detailed study include the following:

1. Revegetate areas of severe mortality and decline and some areas that are only moderately affected by mortality and decline. No commercial harvest of any dead, declining, or living trees. To address safety and visual concerns, dead and dying trees would be felled non-commercially, and left in place, in heavily-used areas and in visually sensitive landscapes.

2. Revegetate areas of severe mortality and decline and some areas that are only moderately affected by mortality and decline. Salvage merchantable dead and dying trees only in those areas that can be logged economically. Dead and dying trees would be felled non-commercially, and left in place, in heavily-used areas and in visually sensitive landscapes.

3. Revegetate areas of severe mortality and decline and some areas that are only moderately affected by mortality and decline. Harvest trees through some combination of salvage and/or regeneration cutting. This would include the harvesting of dead and dying trees as well as some green, healthy trees.

Size of Project Area

Public comment suggested that the size of the project area could be increased to include additional areas where salvage harvest opportunities might exist. This alternative was eliminated from detailed study because the commenter did not provide additional detail to indicate where this opportunity could be found. The ID Team established the project area boundary by examining data to determine the extent of mortality, and to propose treatments where commercially viable salvage treatments were found. Appropriate areas have already been included within this project.

Uneven-aged Management

Three specific alternatives presented by the public or the ID Team proposed the following:

Public Uneven-aged Alternative One - Commercial and Salvage Harvest using Uneven-aged Management

- 3,476 acres of Group Management[2] (where regeneration cuts are proposed in Alternative 1).
- 2,513 acres of Salvage Selection Cutting.
- 1,752 acres of Selection Cutting.

Public Uneven-aged Alternative Two – Commercial Harvest using Uneven-aged Management

- 456 acres of Group Management
- 1,752 acres of Selection Cutting

Public/ID Team Alternative Three – practice uneven-aged management on all of the stands proposed for even-aged management in the proposed action

ID Team response to the Mortality II Court Ruling and public comment resulted in considerable review of analysis conducted as part of the Forest Plan, review of recent literature and research results, and a review of local reforestation success with uneven-aged management. All sites in the East Side project that are proposed for even-aged treatment were also considered for uneven-aged treatment, though only a subset of them were included in an alternative fully developed. The following discussion summarizes the results of that analysis

Summary of Forest Plan Analysis

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 trade-offs between even-aged and uneven-aged management. These trade-offs are addressed in the Forest Plan Analysis Summary and Uneven-aged Management Considerations for Project Analyses from Forest Plan Implementation and Monitoring found in Appendix E of the FEIS. Briefly summarized, the following are highlights from Appendix E:

- 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.
- The environmental consequences of practicing much more uneven-aged management than even-aged management are discussed in the Forest Plan FEIS, Chapter 4. Environmental consequences and cumulative effects are unique for each.
- The Regional Forester considered numerous trade-offs between the effects of even-aged management verses uneven-aged management when selecting the Forest Plan preferred alternative. Trade-offs include effects on dispersed recreation, timber harvest volumes and values, and wildlife habitat.
- He also recognized that controversy on this matter would continue, but the alternatives considered adequately represent the views of one side versus the other.

[2] Group Management was defined by the commenter as synonymous with Group Selection

- With all 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 direction per 36 CFR 219.1).

- 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 problem.

Literature Review, Research Review, and Local Success

The ID Team still felt that it was important to consider the wide-spread use of uneven-aged management. The ID Team examined research findings and monitoring results from the application of uneven-age management on the ANF. It is critical to know the biological characteristics of sites where uneven-aged management has the chance of being successful. Uneven-aged management favors shade-tolerant tree species, and over the long term would cause stands dominated by shade-intolerant species or shade mid-tolerant species to convert to shade-tolerant species (Stout in Marquis 1994, p. 330; Marquis and Johnson in Burns 1989, p. 11). Without an adequate seed source it would be either very difficult or very expensive to establish shade tolerant species. The choice of silvicultural systems in Allegheny hardwoods would be wider were it not for the unusually high deer damage to seedling regeneration on the ANF (Redding 1995; Tilghman 1989). Local silvicultural guidelines specify stands having 35 basal area of shade tolerant species as potentially providing adequate seed source for uneven-aged management (Marquis et al 1992, p. 57) though local success with uneven-aged management on these sites has been very marginal (USDA-FS 1997a, pp. 16, 17, 76, 77).

Stands having adequate shade-tolerant tree seedlings already present in the understory are also potential candidates for uneven-aged management. Within the project area, only American beech seedlings are present in sufficient quantity for stands to be classified as having adequate numbers of shade-tolerant seedlings.

Based on this information and current environmental conditions on the sites proposed for treatment, only those sites with an adequate shade-tolerant seed source or those already adequately stocked with shade-tolerant tree seedlings have the biological conditions necessary to potentially permit successful uneven-aged management. Other sites could be considered, but only with investment in extremely expensive reforestation practices, much higher in cost than those implemented to date. Even then there is still a high probability of failure.

The Deciding Officer determined that an alternative that considered the use of uneven-aged management on all stands was not reasonable due to the extremely high cost and because local research and monitoring data indicate that treatments on stands that do not have the biological characteristics would most likely result in regeneration failure. The Deciding Officer also determined that the Public Uneven-aged Alternatives did not consider the biological feasiblity and very high cost of such uneven-aged management, and that they should not be considered further.

Herbicide Use

Public comment and the ID Team suggested including an alternative that does not use herbicides.

Alternatives 2 and 5 in this project do not include any herbicide use. Furthermore, Alternative B considered in the Forest Plan analysis did not include the use of any herbicides, but that alternative was not selected by the decision maker.

The Forest Plan and the FEIS for Understory Vegetation Management (USDA-FS 1991) reviewed alternatives to using herbicides, and concluded that herbicides are the most effective, least costly, and meet soil, water, health, and safety criteria. Other reforestation methods may be used in lieu of, or in addition to, herbicides if they are expected to be effective on specific sites. Treatment methods including area fencing and manual treatments such as pulling or cutting unwanted vegetation were considered.

When understories are dominated by plants such as dense fern or grass, beech sprouts and striped maple, seedling establishment and growth does not occur unless the inhibiting vegetation is removed. Area fencing is not effective in establishing tree seedlings in stands where inhibiting vegetation is found. Likewise, manual methods are not effective in reducing levels of interference to the point where seedlings can become established. There have been no new technological developments since the FEIS for Understory Vegetation Management was written that would replace herbicide application as the preferred treatment.

Old Growth

Public comments generated four alternative ways to address old growth:

1. Include an alternative with varying amounts of old growth.
2. Look at an alternative that has no additional old growth added to the project area.
3. Look at an alternative that has designated old growth as directed for MA 3.0 and 6.1 areas.
4. Have an alternative that designates old growth.

The decision to manage for old growth is made in the Forest Plan, which sets the minimum amount of old growth for each Management Area. Varying amounts of old growth were considered in the Forest Plan. That EIS documents the wide range of competitive interactions considered and presents a summary in Chapter 2. The evaluation of old growth in this project was based upon site-specific characteristics and values and is designed to meet old-growth needs within the project area, as well as to enhance old growth across the ANF. All action alternatives meet Forest Plan direction as to the amount and distribution of old growth. Alternative 1, which impacts the greatest amount of the project area of all alternatives through vegetative management, leaves 94% of the project area unmanaged this planning period. Therefore, there is ample opportunity in the future for designation of old growth outside of proposed treatment areas once Forest Plan revision establishes spatial distribution patterns for it. Also, intermediate treatments proposed now do not preclude a stand from possible future designation as old growth. As a result, Alternatives 1-5 adequately address old-growth opportunities within the East Side project area. Therefore, there is no need to fully develop an alternative that specifically manages or designates old growth. The effects of no management are displayed in Alternative 5.

Wildlife

Public comment requested alternatives that provide the following:

1. An emphasis on habitat for forest interior species, and
2. Less fragmentation, more old growth, and the decommissioning of roads.

In consideration of these requests, the ID team examined how Alternatives 1-5 impact wildlife habitats, in order to determine whether or not additional alternatives should be developed. The maximum amount of activity proposed within the Project Area is 6% (Alternative 1). Other alternatives proposed less treatment than Alternative 1. Treatments that contribute towards forest fragmentation (even-aged regeneration harvests) are not proposed in Alternatives 2, 4 and 5. Treatments proposed in any alternative do not preclude the potential for old growth to develop in the future. Decommissioning of roads was considered in Alternatives 1 – 4, and there is additional discussion regarding this topic under public Alternatives 2 and 3, which follow. Sufficient analysis of habitat for forest interior species and levels of fragmentation would result with analysis of Alternatives 1 – 5.

Recreation

Public comment proposed the consideration of an alternative that emphasizes recreation opportunities.

Recreation opportunities were reviewed within the East Side Project Area. ANF Recreation Planners did not identify a need to include recreation development proposals as part of this project. Public comment did not provide any specific proposals. It was, therefore, not necessary to have an alternative with an emphasis on recreation. However, impacts of the East Side project on recreation are considered as part of the analysis.

Most recreation projects are analyzed independently of timber management analyses for several reasons: 1) Timing – projects may be at different stages of development; 2) Funding availability – many projects have some element of partnership or grant funding that must be used within a certain timeframe; and 3) Location – timber management and recreation proposals may not share the same project boundary.

Research Natural Area

Public comment proposed the entire Rock Run Watershed to become a Research Natural Area.

Four candidate Research Natural Areas were identified in the Forest Plan. The Rock Run Watershed was not included in this group.

Research natural areas are part of a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity on National Forest System lands. Research natural areas should not show evidence of major disturbance by humans for the past 50 years; a pristine condition is the goal (Forest Service Manual 4063.2).

The Rock Run watershed does not meet the criteria for selection as a Research Natural Area. While the watershed does contain areas of interest (wetlands, sphagnum swamp, etc), the area as a whole has been impacted by human disturbance. Turn-of-the century logging occurred throughout the watershed. Portions of the watershed were active farmsteads until the 1950's. Some areas were planted to white spruce and red pine. In addition, portions of the watershed received a diameter limit cut in the 1960's where trees greater than twelve inches were harvested prior to Forest Service acquisition (which occurred in the 1970's). This pattern of recent human disturbance makes this area unsuitable as a candidate research natural area.

Public Alternative 1 – No Logging, Zero Cutting, Maximize Watershed Protection, Maximize Old Growth, Obliterate Roadways (Source: public comment)

This alternative proposes a management strategy that includes the following:

1. **No logging, Zero cutting**

   This alternative, when considered in its entirety presents a management philosophy that is not compatible with current Forest Plan direction. It proposes management actions that do not provide the mix of goods, services and uses to the public that maximize net public benefit assumptions used in the Forest Plan. The Deciding Officer determined that analysis of this alternative is beyond the scope of this project and that it does not respond to the purpose and need stated for the East Side project. This alternative would be more appropriately addressed in an analysis that looks at broader planning issues, such as Forest Plan revision.

   Also, no logging, or "zero cutting", as described in this comment, is not consistent with Forest Service enabling legislation, is a national issue, and therefore is beyond the scope of this analysis.

2. Maximize old growth

See the Old Growth discussion in the "Old Growth" subsection above.

3. Maximize watershed protection

Watershed protection in areas proposed for management activities is always a driving factor for Allegheny National Forest projects. All of the action alternatives consider road realignment (to determine if moving an existing road to a different location can reduce sedimentation), limestone surfacing (to minimize the effects of road surface run off), and decommissioning of roads no longer required to be part of the ANF road system (to minimize any effects from unnecessary roads). Consideration of these activities and the inclusion of specific mitigation measures to reduce sedimentation are part of every project proposal.

4. Obliterate roadways

All roads within the project area have been examined to ensure that they are necessary for present and future management of the ANF. Roads that are no longer necessary are proposed for decommissioning.

This alternative was eliminated from detailed study because it was determined that it's main elements had already been included in Alternatives 1-5. As a complete alternative, it would not meet the needs for the East Side project identified in the "Need for the Proposal".

In conclusion, many elements of this alternative are considered in the Alternatives Considered in Detail. Alternative 5 proposes no harvest or reforestation treatments and discloses the effects (both short term and long term) on vegetation. Alternative 5 maintains stands within current age classes, and by default, results in the greatest amount of old growth. Alternatives 1 through 4 address watershed concerns by proposing levels of road management and improvements to roads. Moderately to well-stocked forests protect watersheds. Alternatives 1 through 5 look at a range of residual stocking levels that contribute towards watershed protection. Decommissioning of roads is considered in Alternatives 1 – 4. Roads identified that are not needed for long-term management are proposed for decommissioning.

Public Alternative 2 - Watershed Improvement Alternative (Source: public comment)

This is a specific proposal submitted by a member of the public during the scoping process. The objective is to combine "the benefits of No Action with the benefits of the Alternative Action". A copy of the complete proposal can be found in the project file. The following is a summary of the proposed activities:

- **Salvage Brushing on 5,646 acres.**

  "Salvage Brushing" is not a familiar term to silviculturists on the Allegheny National Forest. Clarification was requested from the commentor who proposed this alternative. The explanation received stated that, "'Salvage Brushing' doesn't involve cutting of any kind. This is a method that people have used with some success on old growth beech forests in Canada. It involves the manual removal of scale insects from the exterior bark of the American beech trees using brushes. Done correctly, it would not cause any scarring of the exterior bark and should be done by workers or volunteers without the use of machinery (thereby seriously reducing the danger of stress inducers such as soil compaction)."

  The Northeastern Research Station at Irvine, PA, (USDA Forest Service) was contacted to find out whether "Salvage Brushing" is a viable method to use to stop or slow the spread of beech bark disease. We were referred to Dr. David Houston, the current leading expert on beech scale complex. Dr. Houston said that some time ago he had been contacted by the manager of the Halifax (Canada)

Public Garden and was asked if there was some way to protect a *few special trees in his arboretum* without using insecticides. He suggested the treatment described above (brushing with detergent). In a follow-up conversation, he learned that the technique was working to preserve four special trees, but that it was at a significant cost (Houston, pers. comm.).

Dr. Houston said that it is possible to remove scale insects using a stiff brush and a detergent or other solvent. He stated that this would not be a practical technique in a forest setting, because it would be nearly impossible to remove all the insects with one treatment. The most successful scale insects find very narrow cracks or fissures to inhabit, and they would be very difficult to remove from that location, even with a brush. The crawler stage of the scale insect lasts from late July to well into fall. After a "Salvage Brushing" treatment it is very likely that other eggs would hatch, and crawlers would move throughout the tree. These individuals would then reproduce and re-infest the entire tree. Also, the scale insects inhabit the entire bole of the tree as well as some of the lower branches. It would be extremely time consuming and hazardous to clean that much bark area. Therefore, this is neither a biologically nor economically feasible method of controlling beech scale complex in a large, forest setting such as the East Side project area.

- **White pine and hemlock planting on all edge acreage to shade the forest floor and suppress the development of light tolerant species of vegetation such as fern and grass to improve species diversity within the understory of the interior of the forest.**

  Native conifer planting is prescribed for Alternatives 1, 3, and 4, although not in the manner suggested here. Planting white pine and hemlock along the edge of all harvest areas would not necessarily suppress the development of light loving, interfering species such as fern and grasses as described in this proposed alternative. Local experience shows it is difficult to establish planted seedlings in a shaded environment. It is also an impractical way to establish enough shade to prevent the invasion of fern and grass. If the white pine and hemlock did become established, they could suppress the development of a wide variety of desirable species.

- **Salvage Brushing along a 300-foot stretch along the most likely sources of spread of the beech scale complex**

  See comment on salvage brushing above.

- **Road Obliteration 7.1 to 80.4 miles of roads. The obliteration quantity would have to be determined based upon the following factors:**

  1) **All roads should be considered for obliteration.**

  2) **All roads required by OGM personnel to access private mineral rights should be Restored (see below).**

  3) **All roads required by private inholders should be restored (see below).**

  4) **All old trails and roads which are currently already revegetating should be allowed to do so naturally. (Plant white pine and hemlock within 100-150 feet from edge to prevent invasive interfering plants. Obliteration opportunities would be foregone.)**

  5) **All low stream crossings should be obliterated with special care not to increase sediment discharge into the streams.**

  6) **All roads not needed for other purposes as itemized in #2-4 should be obliterated for the ecological recovery of the area.**

  Large-scale obliteration of roads would not maintain access to the project area for future management or recreational activities as intended in the Forest Plan for MAs 2.0, 3.0, and 6.1.

MAs 2.0 and 3.0 are designated to provide a roaded natural setting for all dispersed and developed recreation opportunities, with an emphasis on motorized recreation in MA 3.0 (Forest Plan, pp.4-70, 4-82). MA 6.1 emphasizes a variety of dispersed recreation activities in a semi-primitive motorized setting (Forest Plan, pp. 4-110). Road decommissioning is proposed in all action alternatives for those roads which are no longer needed for present or future management of the area.

The Forest Service does not have the authority to require OGM operators to "restore" their roads.

Roads necessary for access by private inholders are authorized under a Special Use Permit. The specifications for construction and maintenance are issued along with the permit. All roads are required to be maintained according to the conditions of the permit.

All stream crossings are examined during project analysis. Stream crossings not needed for present or future management are removed. Mitigation measures are prescribed to reduce sedimentation of streams for crossings that remain in place.

- **Road Restoration should occur on up to 80.4 miles of roads and should occur on all roads not scheduled for obliteration.**

  All roads are examined during the analysis process. Based on the existing condition of the roads, recommendations are made as to the type of work necessary to make sure that they meet the standard necessary for the intended use. These recommendations are then carried forward to the proposed action for a particular project. The decision document for a project proposal makes the decision as to the type of work necessary to ensure the roads meet the proper standard. Roads not necessary for implementation are maintained in order to meet resource protection needs or are decommissioned if no long-term needs are identified. Except in unusual cases, roads are not scheduled for restoration until a project is proposed.

- **The Road-Realignment should be considered.**

  The same process as described above regarding road restoration applies to this proposal. The alignment of all roads necessary to carry out a project proposal is examined, and those that need to be realigned in order to protect resources are carried forward to the decision document.

- **Road Re-construction and New Construction activities will degrade water quality through increased short term and long term sediment discharges.**

  Mitigation measures are used during periods of construction and reconstruction to minimize the amount of sediment that will reach a stream. Properly designed and maintained roads will not cause water degradation.

- **All Habitat Improvements listed at the bottom of page 6 in the Proposed Action should concluded (sic.) unless those species being planted are non-native or invasive (sic.).**

  Native species are used for wildlife habitat improvement.

Road management proposals presented here would support access needed for the minimal vegetative management proposed in this public alternative, however it would not support the kinds and amounts of vegetative management or the type of recreation or wildlife enjoyment activities authorized by the Forest Plan. While Alternatives 1–4 propose similar kinds of road management activities (obliteration, restoration and re-alignment) as suggested here, the amounts are much less. The proposal for no road construction or reconstruction (betterment) is addressed in Alternatives 3 and 5.

This alternative, when considered in its entirety, presents a management philosophy that is not compatible with current Forest Plan direction. It proposes management actions that do not provide the mix of goods,

services, and uses to the public that maximize net public benefit according to the Forest Plan. The Deciding Officer determined that analysis of this alternative is beyond the scope of this project. It was eliminated from detailed study because it would not meet the Purpose and Need, some activities proposed are not practical or feasible, nor would it meet the Forest Plan objectives for the East Side project area. It would be more appropriately addressed in an analysis that focuses on broader planning issues, such as Forest Plan revision.

Public Alternative 3 - Ecological Restoration Alternative (Source: public comment)

This is a specific proposal submitted by a member of the public during the scoping process. The objective is to combine "the benefits of No Action with the benefits of the Alternative Action" and "looks more aggressively at restoring the area to an ecological reserve." A copy of the complete proposal can be found in the project file. This suggested alternative contains all of the same proposals as the "Watershed Restoration Alternative" above, as well as the following additional proposals:

- **All roads within the East Side Project Area that are not needed for either private land access should be converted to trails (sic.). The trails, created by this alternative "Roads to Trails" program should emphasize non-motorized recreation such as hiking, mountain biking, dog walking, berry picking, cross country skiing, bird watching, and snow shoeing but should also include trails for snowmobiles (sic.)**

  Converting all roads, which are not needed for access to private land, is neither part of the purpose and need identified for this project in the "Need for the Proposal", pp. 2-4, nor is it in compliance with the goals and objectives of the Forest Plan. The Forest Plan designates special areas for this type of use. Most non-motorized trails receive low use, which indicates that supply exceeds demand. The ANF has met it's goal for the number of miles of snowmobile trail as defined in the Forest Plan and is directing efforts to meet Forest Plan goals for ATV trails. Further, snowmobile trails and other motorized trails are only appropriate in ORV Intensive Use Areas as defined in the Forest Plan. Not all of the East Side project area is within ORV Intensive Use areas.

- **The snowmobile Groups should be explicitly asked what kinds of needs are required for the ASL Trail in this area. Signs showing that volunteers did work in this area should be posted.**

  See the preceding paragraph.

  Trail volunteers are recognized at the trailheads with signs that recognize their work. The ANF has hundreds of volunteers working in various resource areas every year. It is neither practical nor desirable to erect signs of recognition at every volunteer work site. Snowmobile volunteers are recognized at the Longhouse Trailhead and in the MACA Building in Marienville

- **Road activity near the hawk nest in stand 2 at Thomas Rock should be foregone. The beginning of this road should be obliterated and planted with hemlock to restrict human access and light intrusion.**

  Our records do not indicate the presence of a hawk nest in stand 2 in the Thomas Rock vicinity. There is a nest in Compartment 827 in the vicinity of stands 24, 51, and 34. These stands have mitigation measures to protect the nest (seasonal road building, logging, and hauling restrictions with no activity allowed between March 1 and July 31). There is also a 660-foot no-cut buffer around the nest. If similar nests are discovered, they will be given the same mitigation measures if necessary to protect the nest inhabitants.

This proposal, which would convert existing roads to trails, would substantially modify existing access to the project area. ANF Recreation Planners assessed recreation needs within the project area and did not find a need to propose additional trails. Most non-motorized trails receive low use, which indicates that supply exceeds demand. Forest Plan goals for miles of snowmobile trail have been met. ATV trail needs

are being addressed in separate analyses. Project proposals, however, will be made within the Intensive Use Areas identified in the Forest Plan (Forest Plan, p. 4-10). This alternative was eliminated from further consideration for the same reasons as the Watershed Restoration Alternative above.

Comparison of Alternatives

This section provides a summary comparison of the alternatives.

Comparison of Alternatives to the Project Needs

Table 1 displays the amounts of proposed activities by alternative. It also displays the responsiveness of the proposed activities to the needs and opportunities identified on pp. 2-4.

Table 1. Summary of Proposed Activities by Alternatives and Responsiveness of Alternatives to the Needs and Opportunities Identified for the East Side Project

Activity	MA	Need/Opportunity	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Regeneration Harvest – Green (acres)							
Clear-cut	3	2,4,5,6,7	112	0	40	9 (WL)	0
Shelterwood seed cut (1st entry)/ Removal cut (2nd entry)	3	2,4,5,6,7	589	0	252	0	0
Shelterwood removal cut	3	2,4,5,6,7	29	0	29	0	0
Shelterwood removal cut (delay)	3	2,4,5,6,7	88	0	72	0	0
Prep cut / Two-aged	3	2,4,5,6,7	142	0	71	0	0
Reforestation treatments only	3	2,4,7	76	0	76	0	0
Regeneration Harvest – Salvage (acres)							
Clear-cut	3	1,2,4,5,6,7	84	0	84	0	0
Shelterwood seed cut (1st entry)/ Removal cut (2nd entry)	3	1,2,4,5,6,7	1284	0	1156	0	0
Shelterwood removal cut	3	1,2,4,5,6,7	58	0	58	0	0
Shelterwood removal cut (delayed)	3	1,2,4,5,6,7	592	0	470	0	0
Prep cut / Two-aged	3	1,2,4,5,6,7	71	0	32	0	0
Two-aged	3	1,2,4,5,6,7	132	0	130	0	0
Reforestation treatments only	2,3,6.1	1,2,4,7	178	0	420	0	0
Intermediate Treatments (acres)							
Green Thinning	3	3,5,6	1778	0	535	0	0
Salvage Thinning	2,3	3,5,6	2479	4164	1904	2456	0
Uneven-aged – Green (acres)							
Selection	2,3	2,4,5,6,7	118	0	77	855	0
Group Selection	2	2,4,5,6,7	154	0	154	154	0
Transition Cut	3	2,3,5,6,7	18	0	18	0	0
Uneven-aged Salvage (acres)							

Activity	MA	Need/Opportunity	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Selection	2,3	1,2,4,5,6,7	40	0	12	1719	0
Group Selection	2	1,2,4,5,6,7	115	0	115	115	0
Reforestation treatments only	2,3,6.1	1,2,4,7	0	0	0	643	0
Reforestation Treatments (acres)							
Herbicide	2,3,6.1	1,2,4	3419	0	2954	2968	0
Site Preparation	2,3,6.1	1,2,4	3044	0	2575	2797	0
Fertilization	2,3,6.1	1,2,4	1293	0	1074	0	0
Fence Construction	2,3,6.1	1,2,	2282	0	1962	1037	0
Planting	2,3,6.1	1,2,4	797	0	716	302	0
TSI/Release	2,3,6.1	1,2,3,4	576	0	560	409	0
Kane Experimental Forest Treatments (ac)							
Shelterwood, low shade removal	8	1,2,5	3	3	3	3	0
Shelterwood, low shade removal (herbicide)	8	1,2,5	3	3	3	3	0
Shelterwood (inadequate regeneration)	8	1,2,5	3	3	3	3	0
Shelterwood (adequate regeneration)	8	1,2,5	3	3	3	3	0
Delayed Shelterwood, low shade removal	8	1,2,5	3	3	3	3	0
Clearcut	8	1,2,5	3	3	3	3	0
Herbicide	8	1,2,5	6	6	6	6	0
Transportation System Activities							
New Construction (miles)	pvt,2,3	6	15.2	8.3	0	10.0	0
Reconstruction (miles)							
Betterment	pvt,2,3	6	16.0	9.4	0	11.7	0
Realignment	pvt,3	6	1.5	0.9	0	1.1	0
Restoration	pvt,2,3,6.1,6.2	6	92.0	80.6	86.7	87.2	0
Decommissioning	3	6	7.2	5.2	2.0	5.2	0
Temporary road/Long skid		6	0	0	3.5	0	0
Stone Pits (each)							
Existing Pit Expansion	2,3	6	33	28	26	33	0
New Pit Development	2,3	6	10	8	7	10	0

Activity	MA	Need/Opportunity	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Wildlife Treatments (acres)							
Create/Maintain openings	3	7	2	0	2	2	0
Regenerate Aspen	3	7	92	0	92	92	0
Seeding	3	7	54	0	54	54	0
Planting	2,3,6.1	7	668	0	668	668	0
Fencing	3	7	43	0	43	43	0
Prune and Release Apple Trees	3	7	36	0	36	36	0
Release mast producing shrubs/trees	3	7	14	0	14	14	0
Conifer release	3	7	36	0	36	36	0
Nest Boxes (each)	3	7	14	0	14	14	0
Catch basins and fish structures (each)	3	7	9	0	9	9	0
Construct water holes (each)	3	7	7	0	7	7	0
Volume							
Harvest Volume (first entry) (MMBF)			**34**	**6**	**20**	**12**	**0**
Harvest Volume (3-10 years) (MMBF)			**30**	**0**	**23**	**0**	**0**
Cash Flow Analysis (million $)							
Value of Timber Forgone*			**(-1.0)**	**(-1.3)**	**(-1.4)**	**(-1.3)**	**(-3.2)**
Net Cash Flow			**2.3**	**(-2.2)**	**1.7**	**(-3.4)**	**(-0.5)****

**** Represents dead trees that already died due to the delay in harvesting and trees that will die within the next five years.***

***** Represents planning costs.***

Comparison of Alternatives to the DFC for each Management Area

Tables 2-4 provide a comparison of how each alternative moves from the existing condition towards the Desired Future Condition by Management Area.

Table 2. Comparison of DFC to EC and Future Condition by Alternative for MA 3.0.

MA 3.0									
DFC				Existing Condition	At the end of the next decade - 2009				
					Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Vegetative Management									
Age-Class Distribution	Even-aged timber stands distributed across a variety of age classes	0-10 (seedling)	9%	6%	3%	0	2%	0	0
		11-20 (sapling	9%	7%	6%	6%	6%	6%	6%
		111+ (old growth)	Min 5%	1%	4%	6%	5%	6%	6%
Wildlife									
0-20 year age class	Not greater than 20-25 %			13%	9%	6%	8%	6%	6%
50% or more of the project area in mast-producing timber (>35 years old)				84%	81%	85%	83%	85%	85%
Permanent openings	3-10%			2%	2%	2%	2%	2%	2%
Conifer component	No more than 10% in conifer cover			4%	4%	4%	4%	4%	4%
Stocking levels	Limit land area poorly stocked with trees to acres existing in 1986		+0 acres	+1972 acres	+66 acres	+1806 acres	+121 acres	+849 acres	+1806 acres

Table 3. Comparison of DFC to EC and Future Condition by Alternative for MA 2.0.

MA 2.0								
DFC			Existing Condition	At the end of the next decade - 2009				
				Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Vegetative Management								
Permanent openings	1-3%		>1%	>1%	>1%	>1%	>1%	>1%
Conifer component	No more than 10% in conifer cover		3%	3%	3%	3%	3%	3%
Uneven-age structure	Initiate structure development by conducting selection harvest on 97%		36%	60%	36%	60%	60%	36%
Stocking levels	Limit land area poorly stocked with trees to acres existing in 1986	+0 acres	+12 acres	+12 acres	+12 acres	+12 acres	+12 acres	+12 acres

Table 4. Comparison of DFC to EC and Future Condition by Alternative for MA 6.1.

MA 6.1								
DFC			Existing Condition	At the end of the next decade - 2009				
				Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Vegetative Management								
Old growth (stands <111)		Min 5%	0	4	4	4	4	4
Wildlife								
Pole timber and saw timber will comprise a minimum of 70% (greater than 20 years old)			94%	96%	96%	96%	96%	96%
Permanent openings	3-10%		2%	2%	2%	2%	2%	2%
Conifer component	No more than 10% in conifer cover		13%	13%	13%	13%	13%	13%
Stocking levels	Limit land area poorly stocked with trees to acres existing in 1986	+0 acres	+70 acres	+0 acres	+70 acres	+0 acres	+0 acres	+70 acres

Comparison of the Alternatives to the Issues

Table 5 displays the comparison of the alternatives and their response to the unresolved issues identified on pp. 5-7.

Table 1. Comparison of Issues By Alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
The Amount of Timber Harvesting					
Issue: "What level of timber harvest should occur in the East Side project area?"					
Acres of Timber Harvesting					
Even-aged Regeneration Harvest	3,163 Ac	0 Ac	2,391 Ac	0 Ac	0 Ac
Even-aged Intermediate Harvest	1,778 Ac	0 Ac	535 Ac	0 Ac	0 Ac
Uneven-aged Harvest	445 Ac	0 Ac	376 Ac	2,843 Ac	0 Ac
Salvage Thinning	2,479 Ac	4,164 Ac	1,904 Ac	2,456 Ac	0 Ac
Other harvest	18 Ac	0 Ac	3 Ac	9 Ac	0 Ac
Total Acres	7,883 Ac	4,164 Ac	5,209 Ac	5,308 Ac	0 Ac
Long-term sustainability of the forest resource					
% Acres where overstory > 50% stocked, after treatment	93%	71%	91%	71%	71%
% of low-stocked acres with adequate #'s of tree seedlings, after treatment	**96%**	**8%**	**94%**	**58%**	**8%**
% acres (8,137 acres in total project) with adequate #'s of Tree Seedlings, after treatment	43%	8%	36%	11%	8%
Transportation System Activities Necessary to Complete Harvesting Activities:					
New road construction	15.2 Mi	8.3 Mi	0 Mi	10.0 Mi	0 Mi
Reconstruction –Betterment	16.0 Mi	9.4Mi	0 Mi	11.7 Mi	0 Mi
Reconstruction – Realignment	1.5 Mi	0.9 Mi	0 Mi	1.1 Mi	0 Mi
Reconstruction - Restoration	92.0 Mi	80.6 Mi	86.7 Mi	87.2 Mi	0 Mi

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Temporary Road/Long Skid	0 Mi	5.2 Mi	3.5 Mi	0 Mi	0 Mi
Volume/Value of Timber Harvested	64.2 MMBF $18,473,086	5.7 MMBF $1,880,088	42.7 MMBF $13,106,122	12.5 MMBF $3,784,738	0 MMBF $0
The Amount of Salvage Harvesting					
Issue: "Should only dead, dying, and damaged trees be salvage harvested?"					
Percent of acres where dead and dying material is salvaged and utilized	100 %	100 %	82%	100 %	0 %
Value of lost salvage volume, includes value of volume lost since onset of mortality in 1994	$970,271	$1,299,887	$1,479,618	$1,251,828	$3,186,872
The Use of Herbicide and Reforestation Treatments to Help Sustain Forest Cover					
Issue: "Should herbicides be used as a reforestation treatment?"					
Reforestation Activities:					
Herbicide application	3,419 Ac	0 Ac	2,954 Ac	2,968 Ac	0 Ac
Site preparation	3,044Ac	0 Ac	2,575 Ac	2,797 Ac	0 Ac
Fertilization	1,293 Ac	0 Ac	1,074 Ac	0 Ac	0 Ac
Fencing	2,282 Ac	0 Ac	1,962 Ac	1,037 Ac	0 Ac
Planting	797 Ac	0 Ac	716 Ac	302 Ac	0 Ac
Total Acres of Treatment (includes some acres that receive multiple treatments)	**8,137Ac**	**4,164 Ac**	**5,705 Ac**	**5,951 Ac**	**0 Ac**
Potential Risk to Human Health and Wildlife/Aquatic Species	**Negligible**	**None**	**Negligible**	**Negligible**	**None**
Response to reforestation needs and opportunities	**Alternatives will be ranked based upon the number of acres of reforestation treatments proposed in areas where stocking levels are low and the treatments are anticipated to be successful**				
	good	poor	good	moderate	poor
The Level of Road Activity					
Issue: "What level of construction of new roads and reconstruction of existing roads should be implemented in the project area?"					
Road density:					
MA 2.0	3.1 Mi/Sq Mi	3.1 Mi/Sq Mi	3.1 Mi/Sq Mi	3.1 Mi/Sq Mi	2.9 Mi/Sq Mi
MA 3.0	2.3 Mi/Sq Mi	2.2 Mi/Sq Mi	2.1 Mi/Sq Mi	2.2 Mi/Sq Mi	2.1 Mi/Sq Mi

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
MA 6.1	2.1 Mi/Sq Mi	2.1 Mi/Sq Mi	2.1 Mi/Sq Mi	2.1 Mi/Sq Mi	2.1 Mi/Sq Mi
Existing road corridor added to Forest Service road system	33.9 Mi	18.6 Mi	1.8 Mi	23.1 Mi	0 Mi
Road activities:					
New road construction	15.2 Mi	8.3 Mi	0.0 Mi	10.0 Mi	0.0 Mi
Reconstruction –Betterment	16.0 Mi	9.4Mi	0.0 Mi	11.7 Mi	0.0 Mi
Reconstruction – Realignment	1.5 Mi	0.9 Mi	0.0 Mi	1.1 Mi	0.0 Mi
Reconstruction - Restoration	92.0 Mi	80.6 Mi	86.7 Mi	87.2 Mi	0.0 Mi
Temporary Road/Long Skid	0.0 Mi	5.2 Mi	3.5 Mi	0.0 Mi	0.0 Mi
Stone pits:					
Existing	33	28	26	33	0
New	10	8	7	10	0
Even-Aged/Uneven-Aged Management					
Issue: "Should even-aged management or uneven-aged management silvicultural systems be used in the project area?"					
Total acres of even-aged management	7,618 Ac	0 Ac♦	5326 Ac	0 Ac♦	0 Ac
Total acres of uneven-aged management	445 Ac	0 Ac	376 Ac	4,592 Ac	0 Ac
Cash Flow Analysis					
Total cost (Includes cost of reforestation)	$16,173,085	$4,099,737	$11,387,368	$7,193,150	$521,192
Total revenue	$18,473,086	$1,880,088	$13,106,122	$3,784,738	$0
Net cash flow	**$2,300,001**	**(-$2,219,648)**	**$1,718,754**	**(-$3,408,412)**	**(-521,192)**
	Alternatives are evaluated based upon total acres of reforestation applied, and silvicultural method employed (regeneration success based upon 1998 ANF Monitoring and Evaluation Report)				
Acres where regeneration success is anticipated based upon past ANF success trends	High	Low	High	Moderate	Low
	Future stand value is dependant upon species composition that results from treatments applied in East Side units.				
Future stand value	High	Low	High	Moderate	Low

♦ The objective of salvage thinning in Alternatives 2 and 4 to utilize wood fiber and saw timber whose economic value would be lost if not harvested within the next 5-10 years. Alternative 2 proposes to remove (salvage) the dead and dying trees where salvage harvesting is economically feasible. Harvesting only dead and dying trees is not intended to achieve either an even-aged or an uneven-aged structure.

Comparison Of Alternatives By Resource

Physical Environment

Ecological Landtypes

Potentially, there could be three broad environmental consequences of this project on soils and landforms: 1.) surface disturbance which includes compaction, soil displacement, rutting, puddling, and erosion, and loss of landform from road construction and rock pit excavation; 2.) changes in the nutrient cycling; and 3.) loss of productivity in terms of a loss of growing medium from rock pit excavation and long term, but still retrievable, loss through road placements.

Table 6 summarizes the effects of the alternative treatment proposals for items 1 and 3 listed above.

Table 2. Summary of Activities Affecting Soils and Landforms by Alternative

Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5 No Action
Potential Disturbance/Treatment Areas	1,197 ac	633 ac	798 ac	802 ac	0
Herbicide and Fertilization Disturbance	337 ac	0	287 ac	193 ac	0
Fencing	29 ac	0	25 ac	12 ac	0
Vegetation Removal for Road Activity	101 ac	62 ac	24 ac	64 ac	0
Returned by Decommissioning	31 ac	23 ac	9 ac	23 ac	0
Pit Expansion and Development	40 ac	33 ac	30 ac	40 ac	0

The following discussion summarizes effects related to item 2 above. The cycling of nutrients is a constant process. The nutrient cycle is affected by how much biomass is harvested, how it is harvested, how often it is harvested, and how quickly the site has an increase in growing biomass. Two processes were analyzed: carbon and nitrate cycling. By 2019, the increase in younger, faster growing stands capable of accumulating carbon in Alternatives 1 and 3, balanced with the mixture of older stands which have high carbon storage, would provide more opportunity to maximize the carbon storage potential of the area than the other alternatives.

Given the activities associated with the East Side project and local evidence, it is not likely that nitrate concentrations will move towards unacceptable levels or unacceptable off-site movement of nitrates. The differences between the alternatives relate to the potential of the forest floor to remain fully functional and the potential for the sites to be moderately to well stocked with forest cover. Long term, the effect of harvesting and the higher levels of reforestation activities prescribed in Alternatives 1 and 3 are expected to produce much higher tree stocking and a much more functional forest floor than that which would result from the implementation of Alternatives 2, 4, or 5. Alternatives 1 and 3, long term, are expected to result in 91% to 93% of the stands having >60% stocking while 71% of the sites are expected to have tree stocking >60% in Alternatives 2, 4, or 5.

Water

The proposed activities are located in portions of 11 different larger watersheds within the zone of mortality. Within these larger watersheds, there are several smaller watersheds where vegetation management and corresponding road activities are proposed. Runoff from dirt and gravel roads has the

greatest effect on water quality. Since the majority of road runoff comes from streams within 200 feet of a road, the effects are measured by examining roads within 300 feet as well as stream crossings to ensure any potential runoff was evaluated.

Many of the existing roads in the project area that are located within 300 feet of streams are surfaced with pit-run sandstone. This material breaks down at a higher rate than limestone. Monitoring has shown that surfacing roads with limestone results in a significant reduction in sediment concentration and turbidity. Runoff from road segments located in close proximity to stream courses will continue to contribute additional runoff to streams. However, the amount of sediment will be reduced from what is currently occurring as a result of the limestone surfacing.

Chapter 3 discusses individual watersheds within the project area. In summary, Alternative 1 would have 31 miles of road within 300 feet of stream courses surfaced with limestone while Alternatives 2 and 3 would each have approximately 28 miles, and Alternative 4 would have an estimated 29 miles. Alternative 5 would maintain the current situation of 15.5 miles of limestone-surfaced roads. The number of stream crossings surfaced with limestone will increase in Alternatives 1-4. Alternative 5 maintains the current situation of 29 crossings surfaced with limestone.

Transportation

As discussed in the Purpose and Need section, pp.2-4, there is a need to provide an adequate transportation system for both the short and long term access for the management of the National Forest lands within the East Side Project Area. The amount of road construction activity and decommissioning varies by alternative. Please see Table 1 for a summary of proposed transportation activities. Alternative 1 proposes the most road activity followed by Alternatives 4, 2 and 3. Alternative 5 is the No Action Alternative and proposes no road building or reconstruction.

Oil, Gas, and Minerals

Associated with the road construction and reconstruction activities is the need for sources of surfacing material. Such material comes from existing stone sources (pits) on the ANF. This project would require the maximum expansion of 33 existing pits and creation of 10 new pits for surfacing material. The loss of stone is considered an irretrievable, irreversible action. Less road activities associated with Alternatives 2 and 3 would require less pit expansion or development. Under the No Action Alternative, no loss of stone or pit development would occur as a result of this project.

Biological Environment

Vegetation

The major differences between alternatives are in the amount of acreage being regenerated, the amount of dead and dying trees being harvested, and the silvicultural system proposed.

Alternative 1 emphasizes even-aged management techniques in MA 3.0 and uneven-aged management in MA 2.0. This alternative proposes 3,181 acres of even-aged regeneration harvesting and reforestation treatments, 4,257 acres of even-aged intermediate treatments, and 445 acres of uneven-aged management treatments. Regeneration harvests will, in general, take advantage of the window of opportunity to establish new stands. Opening up the forest floor to increased light will allow seedlings to become established. The different types of regeneration harvests are in response to site specific conditions. Of the 3,181 acres of regeneration treatments, 2,221 are generated by a need to reforest declining stands and salvage dead and dying trees. The remaining 960 acres are considered green treatments, however, this does not mean that they are completely healthy. The vast majority of the green treatments are also experiencing mortality and decline. They have not reached the threshold that would put them into the salvage category. Dead and declining trees will be removed and sold as part of the Allegheny National Forest timber sale program. Intermediate harvests will remove dead and dying trees in declining stands

and allow for increased growth on the trees not removed during the thinning process. Uneven-aged management is proposed on 101 acres of MA 3.0 and 344 acres of MA 2.0. Alternative 1 proposes the most area for all types of silvicultural treatments.

Alternative 2 emphasizes salvage thinning of 4,220 acres of trees that are already dead or expected to die within the next 5 to 10 years. No healthy appearing trees would be harvested. Regeneration would not be initiated until evaluated as part of a project for a future entry. Many of the stands would remain in an understocked condition until future treatments are prescribed for these areas. Ninety-eight percent of the stands have interfering vegetation in the understory, and since no treatments are proposed to eliminate it, the understory conditions are expected to remain in the same condition.

Alternative 3 analyzes the same units as Alternative 1 except that it eliminates any stands that would require new road construction or reconstruction-betterment in order to access them. Regeneration harvests are proposed on 2,377 of the 3,181 acres prescribed for Alternative 1. Intermediate harvests are proposed on 2,439 of the 4,257 acres prescribed for Alternative 1. The acreage of uneven-aged management proposed drops from 445 acres to 376 acres. With one exception, the effects on the areas treated will be the same as described for alternative 1. That exception, 224 acres of low stocked stands where regeneration harvesting was dropped but reforestation treatments would still be implemented, would have the opportunity for tree seedlings to develop, but shade from residual trees may limit seedling/saplings from developing into large trees. Other stands that were eliminated in order not to build and upgrade roads will progress as described in the No Action Alternative (Alternative 5).

Alternative 4 emphasizes the use of uneven-aged management. It examines stands that are included in Alternative 1 and selects those that may be adaptable to an uneven-aged condition without high investment costs. Salvage thinning on 2,456 acres is included in order to capture dead and dying trees from stands that are not adaptable to uneven-aged management. Uneven-aged management is proposed on 2,843 acres utilizing individual tree selection and group selection techniques. Deer browsing is a concern in utilizing this management technique. The success of selection cutting depends on the establishment of a new age and size class at each cut and the eventual growth of these stems into the main crown canopy. Interfering plants have to be taken into consideration when selection areas for uneven-aged management since they affect the success of obtaining regeneration. As a general statement, the use of uneven-aged management will cause a shift from shade intolerant species to shade tolerant species and there is uncertainty about the success rate.

Under **Alternative 5**, no action, there will be no change in the character of the vegetation due to management activities. Changes currently taking place due to maturity or decline will continue. The rate of change will be set by the interaction of natural forces such as additional drought, insect defoliations, or windstorms. Much of the tree vegetation is still in a stressed state and a new occurrence of stressors could again accelerate decline.

Where decline is currently severe, change can be expected throughout the current vegetative patterns. Many individual trees currently in decline will die soon or continue to die over the long term. Some currently in decline will survive but their boles and crowns will deteriorate and not function as complete trees. Declining tops and dying trees will permit more sunlight to reach the forest floor, encouraging expansion and growth in understory vegetation. High-density deer populations will selectively browse understory plants to the extent that only a few resistant species will dominate. Over time, the seed-producing overstory will decline to the point where inadequate amounts of seed will be produced for successful, natural regeneration. At the same time, the dense, deer resistant understory would create poor seed germination conditions or would prevent seedlings from becoming established.

Over time, a patchy forest would develop. Surviving overstory trees would vary in stocking with higher stocking levels on mid to lower slopes. Plateau and transition slope areas would have low or sparse overstories with numerous gaps or openings of up to several acres in size. These open canopy areas would

have a mixture of open grass and fern patches, dense mixed or monoculture sapling stands of blocks of striped maple, beech, or sweet birch. The vertical diversity would be somewhat diverse between the overstory and developing midstory.

Over a longer period (>50 years), decline in the overstory would continue, and the sapling patches would develop into pole-sized trees. Striped maple would be cycling back to sapling stage while beech would begin to show the more severe effects of scale complex. Open fern and grass patches would be reduced through encroachment from striped maple, beech, and sweet birch.

There is no past experience to observe this kind of vegetative pattern. It is likely that in 100 or more years this forest type would evolve into a two-age character. A remnant overstory of sparsely stocked old growth trees mixed with various stocking levels of beech and sweet birch mid stories and or mixtures of fern, grass or striped maple understories.

Wildlife

The diversity of wildlife is dependent upon the diversity of available habitat. Habitat changes result from reforestation/harvest activity, wildlife habitat improvement work, and natural successional patterns and processes. Although there will be differences in the amount and types of habitat by alternative, there will be no significant effects to wildlife populations between the alternatives. Wildlife habitat improvements are proposed in Alternatives 1, 3, and 4 and differ in these alternatives only by the amount of openings created in association with a commercial timber harvest. Under no action, habitat for wildlife that presently utilizes the various watersheds will continue to be available, and populations of local wildlife will be maintained. Over time and through the implementation of the various activities, wildlife distribution and use may shift as preferred habitats either become available or are lost. Based on the analysis in Chapter 3 and the Biological Assessment in Appendix C of the FEIS, the effects to the wildlife resource will be kept below any reasonable level of significance.

Social Environment

Heritage

The East Side Project Area contains a wide variety of heritage resources, both prehistoric and historic, representing thousands of years of human use of the area. Surveys were undertaken in the project area to determine if heritage resources would be adversely affected by the activities proposed. As long as the mitigation measures that are incorporated are followed, there will be no direct or indirect effects to the sites in the project area under any of the proposed alternatives.

Recreation

There are many recreation opportunities within the East Side Project Area, and users can participate in a wide range of experiences within a variety of settings. Road construction, harvesting, and reforestation proposals (such as fencing or herbicide) may cause recreationists to move to other locations. Trail users will be the most affected and inconvenienced recreationists in the project area as some proposed treatment areas include activities on or bordering trails, particularly snowmobile and ATV trails. Alternative 1 proposes the most road activities on trails, followed by Alternatives 4, 2, and 3. Alternative 1 proposes the most harvest in areas containing existing trails, followed by Alternatives 4, 3, and 2.

Visual/Scenic

The landscape, as viewed from travel ways and use areas, is important to people who value aesthetics and are expecting a certain level of scenic quality. Recently, tree mortality has affected the natural appearance of the forest and is most noticeable where there is extensive, catastrophic mortality expanding beyond 40 acres in size. In Alternatives 1 and 3, temporary openings will be created from the harvest and reforestation activities proposed. Such activities are in response to the need to restore forested ecosystems and ensure future forest canopy. Some areas will exceed 40 acres, as allowed by 36 CFR 219.27(d)(2). Where possible, mitigation measures such as buffer zones have been incorporated to meet

visual quality objectives. Alternatives 2, 4, and 5 do not result in new temporary openings. In these alternatives, where mortality is heaviest and is either not treated or uneven age management is applied, such areas may appear savanna like and take much longer to become re-forested.

Economic

The actions proposed with this project are designed to help achieve Forest Plan objectives and outcomes. Any time resource management practices are performed, there are direct benefits and costs associated with them. A cash flow comparison was done for each alternative. The purpose of the cash flow analysis was to show the relative difference between alternatives. A review of the data indicates that the differences in cash flow between alternatives are primarily dependent upon the volume of sawtimber harvested, project planning costs, the amount of reforestation work, road costs, and the value of the timber foregone from harvest. Of these, the first two economic variables play the largest role in defining cash flow differences between alternatives.

Alternatives 1 and 3 have the highest cash flows and are positive while Alternatives 2, 4, and 5 have negative cash flows. Alternative 1 has the highest reforestation costs followed closely by Alternative 3. There are no reforestation costs associated with Alternatives 2 and 5 since they both call for letting nature take its course in reforesting the landscape.

Human Health and Safety

Humans use most of the forested areas covered in this analysis. Most of that use is scattered, very intermittent, and of short duration. The risk of falling (live and dead) trees to human safety always exists in a forested setting. For the project areas, overall risks to human safety associated with standing dead trees and falling trees are reduced as the acreage of trees harvested increases. The risk to the public from the actual harvest activity is considered to be low in all action alternatives.

No impacts are expected to water quality for domestic or public water supplies within the project area or near sites proposed for herbicide treatment. Herbicides have been used within the project area since 1987. No adverse effects on human health and safety have been noted. Mitigation measures incorporated within this project, plus additional measures outlined in the Understory Vegetation Management EIS, help ensure that potential effects on human health and safety will be minimal.

Preferred Alternative

The Forest Service's preferred alternative is Alternative 1.

RECORD OF DECISION
for the
Environmental Impact Statement
for the
East Side Project

December 2000

ALLEGHENY NATIONAL FOREST

ELK, FOREST, MCKEAN AND WARREN COUNTIES

PENNSYLVANIA

United States Department of Agriculture

Forest Service

Eastern Region

Caring for the Land and Serving People

This document is available in large print.
Contact the Supervisor's Office 1-814-723-5150

The United States Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political affiliation, sexual orientation, and marital or familial status (not all prohibited bases apply to all programs). Persons with disabilities who require alternative means of communication or program information (Braille, large print, audiotape, etc.) should contact the USDA's TARGET Center at 202/720-2600 (voice or TDD).

To file a complaint of discrimination, write the USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, Washington, DC, 20250-9410 or call 202/720-5964 (voice or TDD). The USDA is an equal opportunity provider and employer.

Printed/photocopied on Recycled Paper

INTRODUCTION

This Record of Decision documents my decision to authorize management activities that will occur within Elk, Forest, McKean and Warren counties on the Marienville and Bradford Ranger Districts of the Allegheny National Forest (ANF). I have selected Alternative 1 as described in the Final Environmental Impact Statement for the East Side Project (East Side FEIS). A description of Alternative 1, with summaries of the treatments and actions that will occur are found in the East Side FEIS (pp. 19-22); a detailed stand listing of the vegetative management actions can be found in the East Side FEIS Appendix B (Table 23, pp. 40-50). A listing of the stand-specific mitigation measures that are a part of this alternative are found in FEIS Appendix D. The maps for Alternative 1 detail the locations of treatment units and can be found in the East Side EIS Map Book.

Actions included in Alternative 1 achieve the objectives of the Allegheny National Forest Land and Resource Management Plan (Forest Plan) by moving conditions within the project area from the existing condition towards the desired future condition (DFC) (as defined by the Forest Plan). These actions implement the Forest Service natural resource agenda at the local project scale by striving to maintain and restore healthy and resilient watersheds and ecosystems. Moving towards the DFC involves changing vegetative composition, age distribution, and forest cover type distribution by implementing a variety of vegetative management activities, as well as implementing other kinds of resource management activities.

ENVIRONMENTAL IMPACT STATEMENT

The Environmental Impact Statement for the East Side Project was prepared to comply with the order of Judge William L. Standish, who on October 15, 1997 ordered that an environmental impact statement be prepared that "reconsiders the*(ir)* determination that even-aged management techniques proposed in the Mortality II project for Management Area 3 meet*(s)* the 'optimality' and 'appropriateness' requirements set forth in 16 U.S.C." The East Side Project includes the proposals originally included in the Mortality II project, as well as other proposals that are found within the East Side project area.

The decision, as documented herein, is based upon my consideration of the environmental conditions found within the East Side project area, findings of local research, consideration of local monitoring results since 1987, the anticipated environmental impacts of activities proposed in the East Side FEIS, analysis of comments received from the public, as well as all applicable legal and policy requirements; particularly the National Environmental Policy Act (NEPA), the National Forest Management Act (NFMA), and the Endangered Species Act (ESA).

The U.S. Department of Agriculture – Forest Service (Forest Service) is the lead agency that prepared the East Side FEIS. The Forest Service followed Council of Environmental Quality regulations and Forest Service manual direction in completing and documenting the environmental analysis. An Interdisciplinary Team of foresters, wildlife biologists, recreation planners, transportation planners, and archaeologists conducted all aspects of the environmental analysis, including public involvement.

PURPOSE AND NEED

Purpose

The purpose of the East Side Project is to propose actions that move the area from the existing condition towards the desired future condition, as described in the Forest Plan. This includes implementing the Forest Service Natural Resource Agenda at the local project scale by striving to maintain and restore healthy and resilient watersheds and ecosystems. Inherent in this process is the monitoring of land uses, management activities, and naturally occurring ecosystem disturbances, such as those that have occurred in the East Side Project area. Moving towards the DFC involves changing vegetative composition, age distribution, and forest cover type distribution by implementing a variety of vegetative management activities, as well as implementing other kinds of resource management activities.

In all of the Management Areas (MA) within the East Side project, there is a basic objective to maintain healthy and resilient forest ecosystems that are capable of supplying the vegetative setting necessary to provide the

conditions, land uses, watershed functions, and outputs necessary to achieve the purposes of each MA. This includes maintaining healthy, well-stocked forest vegetation.

Need for Action

The following list describes the "needs for action" and opportunities identified for the East Side area that would meet the purpose of implementing the Forest Plan by restoring the forested ecosystem and moving the area towards the DFC.

1. **Initiate reforestation treatments to restore the declining forest ecosystem –** As described in the Background Section (East Side FEIS, p. 1), the vegetation within the East Side project area has undergone considerable change since 1991, primarily due to extensive defoliation, drought, and subsequent decline and/or mortality. As a result, a number of stands are no longer in a healthy, productive, or resilient condition and are not capable of meeting long-term Forest Plan objectives. There is a need to begin a series of reforestation treatments that will re-establish new healthy stands and restore their respective watersheds to a healthier condition. In some cases, the stands have deteriorated to the point where they no longer function as forested ecosystems, and reforestation activities are necessary to establish a new stand of trees.

2. **Establish tree seedlings to restore tree regeneration or replacement and to improve the horizontal and vertical diversity in the ecosystem –** Horizontal and vertical diversity of the forested ecosystem has been significantly altered at the landscape level as a result of long-term, high deer population densities in relation to carrying capacity. A healthier forest ecosystem would be composed of the following: a low layer (understory) of native herbaceous plants, shrubs, and tree seedlings; an intermediate layer of shrubs and young trees; and an overstory of dominant and co-dominant trees. Because of browsing by deer, the understory is often composed of ferns, grass, striped maple, and beech brush. The shrub layer, new tree seedlings, and many herbaceous plants are missing in the landscape ecosystem (Forest Plan, Appendix D, pages D-15 and D-16). On some sites, there is a need to restore the understory and to improve the horizontal and vertical diversity in the ecosystem. Tree seedlings can be established and understory conditions restored by one or more of the following actions: initiating reforestation activities (fertilization, herbicide application, fencing) that mitigate the effects of long-standing, high deer populations; mechanical and manual site preparation (to stimulate natural regeneration); and artificial regeneration work (planting seedlings). Once seedlings are established they can be encouraged to grow either by a partial or full removal of the overstory (Forest Plan, Appendix D pages D-14 through D-22). In many of these stands there is also an opportunity to salvage dead, dying, or degrading trees (Forest Plan p. 4-48 and 4-49).

3. **Enhance health and vigor of forested stands by regulating stocking and species composition -**Areas with stocking levels greater than 80% are producing tree-to-tree competition for space and nutrients. This creates stress on individual trees. Reduction of stocking levels through harvesting of dead and dying trees, as well as some trees unaffected by mortality and decline, will reduce future stress and possible decline and mortality of residual trees that are needed to maintain continuous forest cover (Marquis et al 1992 p 10[1]; Marquis ed.1994b pp 247-251).

   Within the project area, there are also some young stands in need of intermediate treatments to improve stocking and species diversity. This work can be accomplished most efficiently if done concurrently with the needed reforestation treatments in the project area. This will move the area toward the objective to provide forest cover to sustain healthy watersheds and produce a sustained yield of high quality Allegheny Hardwoods through even-age management (Forest Plan, p. 4-82).

4. **Sustainable forest management** – The primary purpose of MA 3.0 is to provide a sustained yield of high quality hardwood sawtimber and to provide age- and size-class diversity for wildlife habitat (Forest Plan, p. 4-82). It is necessary to start reforestation treatments and regeneration harvests in a portion of mature or declining stands now to promote the sustainable delivery of forest products in MA 3.0. This will create the

[1] Reference information can be found in Chapter 5 of the East Side FEIS, unless otherwise noted.

age-class distribution levels described in the DFC for MA 3.0 and will provide an even flow of forest products over the long-term. Management activities could include regeneration/reforestation treatments such as two-aged harvesting, shelterwood harvest sequences, final harvests, with some implemented through adaptive management. Most of the stands proposed for regeneration contain substantial tree mortality/decline or are at risk of further decline when new stress events occur.

5. **Supply forest products to meet public demand and to contribute to the economic vitality of local communities -** Congress has directed the Forest Service to provide forest products within the capability of the land and individual Forest Plans (16USC475, 16USC531). The ANF Forest Plan allocates land for the sustainable production of forest products (MA 3.0, Forest Plan, p. 4-82). People's demand for hardwood and other forest products (furniture, paper, fiber and construction materials) continues to be high. This supports the need to supply this renewable resource. There is opportunity in this project to supply forest products through salvage (Forest Plan p. 4-48 and 4-49) and green harvests (within the capability of the land) that provide a means to satisfy the public's demand for wood and also contribute to the economic vitality of local communities. Some of the stands within the project area have sustained only partial or moderate tree mortality or decline, while in others the decline/mortality is much more substantial. In both instances, the affected trees would lose substantial value as forest products if harvests were not timely.

6. **Transportation system development to provide access and to maintain water quality -** There is a need to provide an adequate transportation system for both the short- and long-term access for the management of the National Forest lands within the East Side project area. Investments in the existing Forest Service road system are needed to maintain or improve the safety or operating efficiency of roads. Investments in new roads are needed in areas that do not currently have adequate access; and there is a need to initiate vegetative treatments.

   Poorly maintained roads, improperly located roads, or roads no longer needed can have adverse impacts on watersheds. There is a need to ensure that the transportation system within the project area (new and existing) will not further degrade water quality. Opportunities exist to maintain and enhance water quality in some areas. This could be accomplished by eliminating unnecessary roads and by surfacing roads within 300 feet of streams to reduce the amount of sedimentation to streams.

7. **Restore wildlife habitat** - Many of the stands in the East side project area have declined to such an extent that they have less than half of the normal levels of tree stocking. In some areas there is a lack of canopy closure, and forested habitat is no longer provided. The natural replacement of this forest cover is inhibited by long standing, high deer populations. Restoring forest ecosystems is also an opportunity to enhance wildlife habitat through vegetative management techniques and to develop habitat structure. Habitat improvement in declining areas will include site preparation and planting of species that benefit wildlife and will occur concurrently with habitat improvement activities in areas unaffected by mortality and decline. There are also opportunities to improve wildlife habitat through additional activities such as: construction of water holes, catch basins and fish structures, seeding and planting, aspen regeneration, and conifer release.

DECISION

The decision to be made is which alternative best responds to the needs and opportunities within the East Side project area, in light of the existing conditions found and the long term desired future condition defined by the Forest Plan and the Forest Service Natural Resource Agenda. I have made this decision by considering:

1. How alternatives addressed in the East Side FEIS respond to the issues raised by the public and internally for this analysis;
2. How alternatives fulfill Forest Service responsibilities under the National Forest Management Act, the National Environmental Policy Act and other applicable laws and agency direction;
3. The direct, indirect and cumulative environmental effects of implementation of the alternatives.

ANALYSIS PROCESS

The East Side FEIS examines alternative ways to address the main issues and predicts the effects and tradeoffs that would result. The following steps were included in preparing the environmental study:

- Public involvement throughout the process
- Identify issues and decide the scope of the decision
- Assess the Forest-wide impact of mortality (see, for example, McWilliams et al. 1996 or McWilliams 1999)
- Gather of stand-level data and development of stand-specific treatments, with mitigation
- Characterize present condition data for stands proposed for treatment, and for the project area
- Review new research findings, review scientific literature on uneven-aged management, review ANF Monitoring and Evaluation Reports
- Consider implications of June 1, 1999 USDI-FWS Biological Opinion on management potential, and new standards and guidelines included in Amendment 11 to the ANF Forest Plan
- Identify outcomes of alternatives based on anticipated effects of treatments for each alternative
- Identify the preferred alternative
- Publish the Draft EIS
- Receive and analyze public comments on the Draft EIS
- Prepare and publish the Final EIS
- Select the final preferred alternative

AUTHORIZATION OF ALTERNATIVE 1

I have reviewed the FEIS for the *East Side Project* and fully understand the environmental effects disclosed therein. After careful consideration of the issues raised, applicable laws, the Forest Plan, the Forest Service Natural Resource Agenda, and public comments, I have selected Alternative 1 for implementation for the following reasons:

1. Alternative 1 proposes actions that are consistent with the Forest Service Natural Resource Agenda (USDA, Forest Service. 10/98. "Charting our Future… A Nation's Natural Resource Legacy." FS-630) with respect to watershed protection, sustainable forests, and roads:

   "Watershed restoration and maintenance are the oldest and highest callings of the Forest Service." I have carefully examined the effects of all activities proposed in Alternative 1 and have determined that the integrity of perennial and intermittent streams are maintained, and that riparian-dependent resources are either protected or enhanced. The existing transportation system has been evaluated to determine what maintenance or reconstruction needs occur, with particular attention given to stream crossings and road segments found within 300' of streams. Alternative 1 includes the following actions to remove the potential for sedimentation: 1) decommissioning approximately 7.2 miles of road, 2) improving 28 stream crossings, and 3) resurfacing approximately 15.5 miles of roads located within 300' of streams. New road construction necessary for this project will comply with Forest Plan standards and guidelines that ensure that water quality is maintained. There are ten site-specific mitigation measures to protect water quality included in Appendix D.

   "Our national forests should be a model for demonstrating how active forest management can meet economic needs and maintain and restore watershed health." The forest management activities proposed in the East Side project achieve several purposes. In stands where tree mortality and decline is severe, treatments are designed to restore forest cover so that in the long term, sustainable forest

ecosystems can develop. In stands where tree mortality and decline is light to moderate, the harvest of forest products contributes towards local economic stability, while maintaining the health and vigor of forested stands. Finally, healthier stands have been selected to receive regeneration harvests in order to achieve the mosaic of stand age and size class distribution called for in the Forest Plan. The selection of silvicultural systems is based upon site-specific stand analysis, and is supported by the most current silvicultural research. I am satisfied that the vegetative analysis adequately considers both short term and long term effects, and that these effects are consistent with principals of ecosystem management.

"Crucial to the financial vitality of local communities, forest roads provide wildland access for grazing, logging, fire protection, forest management, private land use, and energy and mineral development." A National Forest road system should be "safe and affordable while minimizing its ecological impacts." I have reviewed the transportation system proposals and find that with the exception of grazing, which is not an authorized use on the ANF, the Forest Service roads within the Eastside project achieve these objectives. The transportation system that results from implementation provides adequate access for management activities and serves administrative and public needs. This requires the construction of 15.2 miles of new roads. The safety of existing roads is improved by restoring the traffic service level on 92 miles of road and by raising the traffic service level on 16 miles of road. The environmental impacts of the transportation system are minimized by adhering to Forest Plan standards and guidelines pertaining to road construction and maintenance and by reducing the potential for sedimentation on roads found within 300' of streams.

2. Of all the alternatives, I believe that Alternative 1 provides the best response to the needs for action and opportunities identified for the East Side project. The amount of activity is well within levels anticipated in the Forest Plan, even when the cumulative treatment totals (that includes past as well are future projects) are considered. Alternative 1 responds to the needs for action and opportunities in the following ways:

   a) **Initiate reforestation treatments to restore the declining forest ecosystem** - Without prompt action, forested ecosystems will continue to decline in stands where severe mortality has occurred. Alternative 1 provides the maximum response in terms of the numbers of acres treated, using the most reliable silvicultural methods. These actions result in 2,554 acres that are restored to a more productive, resilient condition.

   b) **Establish tree seedlings to restore tree regeneration or replacement and to improve the horizontal and vertical diversity in the ecosystem** – In addition to the acres where severe mortality has occurred (identified above), there is opportunity to move towards the Forest Plan DFC for age and size class diversity by regenerating some stands not in decline. The inclusion of 1,326 acres results in positive gains towards achieving the Forest Plan DFC.

   c) **Enhance health and vigor of forested stands by regulating stocking and species composition** – There are 4,257 acres included in the East Side project that will benefit from intermediate thinnings or release treatments that will encourage healthy resilient conditions.

   d) **Sustainable forest management** – Alternative 1 proposes treatments that contribute towards the DFC envisioned by the Forest Plan and helps improve conditions necessary to sustain a forested setting and the supply of forest products. Although there have been numerous public comments made regarding the size of the project, I am confident that East Side treatment totals are reasonable. I base this on the cumulative effects data presented in the East Side FEIS Chapter 3 (pp. 181-186). Even when all past projects and reasonably forseeable future projects are considered, the level of activity proposed in Alternative 1 is well within the range of treatments envisioned by the Forest Plan.

   e) **Supply forest products to meet public demand and to contribute to the economic vitality of local communities** – The East Side project generates 64 MMBF of forest products worth an estimated $18.5 million dollars over the next decade.

f) **Transportation system development to provide access and to maintain water quality** – Alternative 1 addresses transportation needs by adding to the road system where access currently does not exist, by increasing the safety of existing roads by restoring roads to their designed traffic service levels or by raising the traffic service level. Water quality needs are addressed by making improvements to road surfacing materials used within 300' of streams, by improving stream crossings, and by decommissioning approximately 7.2 miles of road.

g) **Restore wildlife habitat** – Improvements to wildlife habitat result from Alternative 1 treatments. Early successional habitat will be created and quality forested habitat will be provided in the long term. There are 984 acres of wildlife habitat improvement treatments proposed.

3. Alternative 1 contributes towards the attainment of the desired future condition envisioned by the Forest Plan:

a) **MA 2.0** – At the beginning of this planning decade, 36% of MA 2.0 within the East Side project area had received treatments designed to enhance uneven-aged structure development. Treatments proposed in Alternative 1 result in a total of 60% of East Side MA 2.0 acres treated to help develop an uneven-aged structure. While local success from this type of treatment has been highly variable, monitoring the results of these uneven-aged treatments will further our overall understanding of the effectiveness of this silvicultural system.

b) **MA 3.0** –Stand regeneration and reforestation activities in areas where severe mortality has occurred and in stands selected to meet MA 3.0 age class objectives will provide long-term benefits related to forest sustainability. Stands that are currently at dense stocking levels will be thinned to lower of levels of stocking that produce more vigorous stand growth. Reforestation treatments (including herbicide application, fencing, planting and fertilization) in combination with commercial timber harvests are necessary to create conditions that are favorable for seedling establishment and development.

By the year 2010, East Side treatments will result in only 3% of MA 3.0 acres of the East Side project area in the 0-10 year age class. Other projects will need to be pursued in order to achieve Forest Plan age class distribution objectives. The most important contribution of the East Side project is that long term forest sustainability is assured as a result of the reforestation emphasis of Alternative 1.

c) MA 6.1 – Treatments in MA 6.1 will promote the establishment of seedling regeneration in areas sparsely stocked with overstory trees where regeneration is not likely to develop without reforestation treatments. Mature and over-mature stands will predominate this MA, with 91% of the area over 50 years of age.

d) **MA 8.0 –** MA 8.0 provides areas where research projects can be designed to increase our understanding of ecosystem response to management activities. The project proposals included here are a continuation of research that is the basis for many of the silvicultural protocols used on the ANF.

DESCRIPTION OF ALTERNATIVE 1

Alternative 1 proposes reforestation and timber harvest activities that promote forest ecosystem restoration in response to changes in vegetation that have occurred as a result of light to severe mortality and decline. This alternative initiates salvage regeneration harvest and reforestation prescriptions in areas of severe mortality. It proposes salvage thinnings in areas of light to moderate mortality. It also proposes only reforestation activity in stands that are severely impacted by mortality but no longer have commercially viable harvest options. Vegetation is managed primarily by using even-aged systems in MA 3.0 and 6.1, and uneven-aged systems in MA 2.0, per Forest Plan direction. Alternative 1 also proposes vegetative management prescriptions and wildlife habitat enhancement activities that meet Forest Plan objectives for MA 2.0 and 3.0 in stands that are not impacted by mortality.

Alternative 1 proposes transportation system management that provides access to support timber harvest, reforestation and wildlife habitat activities.

Proposed Activities

The types and quantities of activities proposed in Alternative 1 (proposed action) are summarized in Tables 1-3. Alternative 1 maps display the distribution of the proposed treatments within the 139,990-acre zone of mortality. See Appendices B and C for a detailed list of the treatments proposed for each stand.

Table 1 displays the total vegetative treatments proposed for Alternative 1.

Table 1 - Alternative 1: Total Vegetation Treatments (acres)

Activity	MA 3.0	MA 2.0	MA 6.1	Total	Herbi-cide	Site Prep	Ferti-lize	Fence	Plant	TSI/ Release
EVEN-AGED REGENERATION HARVESTS										
Green										
Clearcut (includes 18 ac. wildlife openings)	112	0	0	**112**	**21**	**0**	**13**	**40**	**21**	**16**
Shelterwood seed cut (1st entry)/Removal cut (2nd entry)	589	0	0	**589**	**610**	**547**	**311**	**236**	**66**	**34**
Shelterwood removal cut	29	0	0	**29**	**9**	**3**	**44**	**25**	**9**	**44**
Shelterwood removal cut (delay)	88	0	0	**88**	**87**	**82**	**28**	**74**	**24**	**0**
Prep cut / Two-aged	142	0	0	**142**	**125**	**139**	**0**	**138**	**24**	**0**
Reforestation treatments only	76	0	0	**76**	**43**	**21**	**29**	**6**	**18**	**35**
Salvage										
Clear-cut	84	0	0	**84**	**78**	**85**	**85**	**39**	**39**	**0**
Shelterwood seed cut (1st entry)/Removal cut (2nd entry)	1284	0	0	**1284**	**1227**	**979**	**535**	**896**	**283**	**21**
Shelterwood removal cut	58	0	0	**58**	**6**	**25**	**43**	**5**	**5**	**0**
Shelterwood removal cut (delayed)	592	0	0	**592**	**574**	**473**	**191**	**452**	**109**	**82**
Prep cut /Two-aged	71	0	0	**71**	**71**	**71**	**0**	**39**	**14**	**0**
Two-aged	132	0	0	**132**	**132**	**119**	**0**	**79**	**36**	**0**
Reforestation treatments only	28	60	90	**178**	**169**	**150**	**0**	**90**	**11**	**0**
INTERMEDIATE TREATMENTS										
Green										
Commercial Thinning	1778	0	0	**1778**	**0**	**0**	**0**	**0**	**0**	**0**
Salvage										
Salvage Thinning	2479	0	0	**2479**	**5**	**1**	**14**	**3**	**3**	**0**
UNEVEN-AGED										
Green										
Selection	55	63	0	**118**	**43**	**68**	**0**	**43**	**43**	**63**
Group Selection	0	154	0	**154**	**127**	**154**	**0**	**25**	**0**	**154**
Transition Cut	18	0	0	**18**	**0**	**0**	**0**	**0**	**0**	**0**
Salvage										
Selection	28	12	0	**40**	**12**	**12**	**0**	**12**	**12**	**12**
Group Selection	0	115	0	**115**	**80**	**115**	**0**	**80**	**80**	**115**
Total	**7643**	**404**	**90**	**8137**	**3419**	**3044**	**1293**	**2282**	**797**	**576**

Transportation Activities

Transportation management activities include road construction, road reconstruction (including betterment, re-alignment and restoration), decommissioning of existing roads, expansion of existing stone pits, and the development of new pits. Road construction and reconstruction proposals occur on segments of roads that are

needed to support vegetative management activities. No long skids are proposed. These activities provide transportation systems that are adequate to support the management activities on National Forest lands.

Table 2 - Alternative 1: Proposed Transportation System Activities (miles, # of pits)

ROAD SYSTEM ACTIVITIES (Miles)	Private	MA 2.0	MA 3.0	MA 6.1	MA 6.2	Total
New construction	**0.2**	**0.1**	**14.9**	**0.0**	**0.0**	**15.2**
Road reconstruction						
Existing road betterment	1.2	0.3	14.5	0.0	0.0	16.0
Existing road realignment	0.3	0.0	1.2	0.0	0.0	1.5
Existing road restoration	6.8	6.1	76.5	0.2	2.4	92.0
Total road reconstruction	**8.3**	**6.4**	**92.2**	**0.2**	**2.4**	**109.5**
Existing road decommissioning	**0.0**	**0.0**	**7.2**	**0.0**	**0.0**	**7.2**
Temporary road/long skid	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Stone pits (# of pits)	**0**	**3**	**40**	**0**	**0**	**43**
Existing pit expansion	0	1	32	0	0	33
New pit development	0	2	8	0	0	10

Wildlife Treatments

Wildlife habitat improvement activities are proposed to increase species diversity in the project area by planting shrub and tree species that are absent or found in small amounts, to establish habitat components such as permanent openings, to promote the growth of existing trees and shrubs beneficial to wildlife. Wildlife treatments are proposed in MA 2.0, MA 3.0, and MA 6.1.

Table 3- Alternative 1: Wildlife Treatments (acres)

Wildlife Treatments	MA	Acres
Create/Maintain openings	3.0	2
Clearcut for opening	3.0	9
Regenerate aspen	3.0	92
Seeding	3.0	54
Planting	3.0	466
Planting	2.0	187
Planting	6.1	15
Fencing	3.0	43
Prune and release apple trees (108)	3.0	36
Release mast producing shrubs/trees	3.0	14
Conifer release	3.0	36
Nest Boxes	3.0	14
Catch basins and fish structures	3.0	9
Construct water holes	3.0	7

Timber Outputs

Alternative 1 will generate a harvest volume of approximately 34 MMBF of timber in the first entry and 30 MMBF in three to ten years from the final harvest of shelterwood seed treatments.

MITIGATION MEASURES

A key component of my decision is to require that all activities in the project comply with all applicable mitigation measures as listed in East Side FEIS Appendix D – Management Requirements and Constraints. All mitigation measures in this decision are key to the implementation of this project. The mitigation measures are designed to minimize or eliminate potential effects of the project on soils, water, wetlands and floodplains, vegetation, wildlife, fisheries, visual resources, heritage resources, recreation, and the social/economic environment of the project area.

MONITORING REQUIREMENTS

Administrative monitoring of the completion of treatments as described in the FEIS and evaluation of the effectiveness of treatments will be completed as projects are implemented. Activities implemented under this decision will be included in annual monitoring and evaluation efforts, some of which are reported in the annual Forest Monitoring and Evaluation Report (See, for example, USDA-FS 2000a). East Side activities will be included in annual monitoring reports provided to the U.S. Fish and Wildlife Service.

I am aware that the units of measure (acres, miles, etc.) presented for the various activities included in the FEIS are the best approximation available to the resource specialists at the time the document was prepared. It is possible that actual unit size that occurs during project layout may vary slightly from what is presented in the FEIS. Any changes that result will be evaluated to ensure that any effects are within the parameters of the discussion of effects in Chapter 3 of the FEIS, and will be documented in the East Side project file.

PUBLIC INVOLVEMENT

In accordance with NEPA and Forest Service NEPA direction, consultation and public involvement has occurred throughout this environmental analysis process.

On April 23, 1998 a scoping letter was sent to all those people and organizations that had requested information concerning proposed management activities. A Notice of Intent (NOI) to prepare an environmental impact statement was published in the Federal Register at the same time. The scoping letter presented the Purpose and Need, and Proposed Action and invited comments from members of the public to help identify issues that they might have concerning the Proposed Action.

A total of 242 responses to the "public scoping" were received by the Forest Service. Comments were identified and sorted by issue area. These comments assisted in the formation of alternatives used in the analysis process. This resulted in the *East Side Draft Environmental Impact Statement* (DEIS).

The "Notice of Availability" (NOA) of the DEIS was published in the April 21, 2000 issue of the Federal Register (Vol. 65, No. 78, pp. 21418), and the public comment period began on April 21, 2000. The full draft EIS or a summary draft EIS and a letter identifying the Allegheny National Forest's preferred alternative was mailed to approximately 503 individuals, organizations, and agencies on April 12, 2000.

Three field tours of the project area were presented by ANF personnel to members of the media (by ANF invitation) and to several public groups (at their request). These took place during March and June, 2000.

The close of the Forest Service comment period on the DEIS was June 5, 2000. There were 143 letters and E-mails received in a timely manner from individuals, organizations, and agencies. Our response to those comments is published in the final EIS (FEIS) as Appendix G.

The East side project has been developed in cooperation with the U.S. Fish and Wildlife Service. Through informal consultation, the U.S. Fish and Wildlife Service has been informed of proposed activities and provided comments. A letter of concurrence on the East Side Project from the U.S. Fish and Wildlife Service was received on December 5, 2000.

ISSUES

I have reviewed the comments received through scoping (Appendix A), have considered ANF management concerns, have considered comments received in response to the DEIS (Appendix G), and have identified five issues that pertain to this analysis (p. 34).

1. **What level of timber harvest should occur in the East Side project area? –** There is on-going public debate regarding the level of timber harvest that should occur on National Forest lands. While the Forest Plan authorizes the use of commercial harvest activities to achieve vegetative management and wildlife habitat objectives, there is no pre-determined schedule as to when or where these activities should occur. Site-specific analyses such as East Side are developed to consider the local implementation of Forest Plan management direction. Therefore, the Interdisciplinary Team (ID team) was directed to develop alternatives to the proposed action that examine differences in effect of varying levels of timber harvest.
2. **Should only dead, dying, and damaged trees be salvage harvested?** – There were comments received that question the need to do 'more' than just salvage dead, dying, and damaged trees. While salvage harvest does not address issues related to long-term sustainability, it provides a basis for comparison of effects of reforestation methods. Therefore, the ID team was directed to develop an alternative that proposes only the salvage harvest with no emphasis on long term vegetative management needs.
3. **Should herbicides and other reforestation treatments be used to help sustain forest cover in declining forest ecosystems?** – Ecosystem sustainability is a primary factor to be addressed in determining what kinds of management actions to take on National Forest lands. The use of reforestation techniques in conjunction with commercial harvest activity can be an effective means of establishing tree seedlings that promote forest sustainability. There is, however, some debate regarding the necessity for reforestation efforts. Therefore, the ID team was directed to consider alternatives to the proposed action that do not use reforestation techniques.
4. **What level of construction of new roads and reconstruction of existing roads should be implemented in the project area?** – Controversy regarding transportation system management was recognized in the Record of Decision for the FEIS for the Land and Resource Management Plan (USDA 1986b, p. 27), and public opinion is still divided on this issue. The Forest Plan authorizes the construction and maintenance of a transportation system that satisfies administrative and public access needs. Therefore, the ID team was directed to consider transportation system needs in the development of alternatives.
5. **Should even-aged management or uneven-aged management silvicultural systems be used in the project area?** – Controversy regarding the use of even-aged management was also recognized in the Record of Decision for the FEIS for the Land and Resource Management Plan (USDA 1986b, p. 26), and public opinion is again, still divided on this issue. Even though the Forest Plan directs that even-aged management be the primary silvicultural system used in MA 3, there still needs to be site-specific consideration given to the selection of either even-aged or uneven-aged silvicultural methods. And ultimately, we were directed to give additional consideration to silvicultural methods as a result of the order of Judge William L. Standish, who on October 15, 1997 ordered that an environmental impact statement be prepared that "reconsiders the*(ir)* determination that even-aged management techniques proposed in the Mortality II project for Management Area 3 meet*(s)* the 'optimality' and 'appropriateness' requirements set forth in 16 U.S.C." Therefore, the ID team was directed to consider a wide range of silvicultural alternatives in this analysis.

ALTERNATIVES

There were virtually a limitless number of alternatives that could have been developed by the ID team for this analysis. Alternatives were developed by considering the proposed action in response to the issues raised above, and by considering the subject areas of concern raised by the public (East Side FEIS pp. 29-38). There were also several well-developed alternatives presented to the ID team by members of the public. The ID team developed

five alternatives that were considered in detail in the analysis. This represents a broad range of alternatives that provides sufficient comparative analysis on the range of effects that could occur in the East Side project area.

Alternatives Considered in Detail

Alternative 1 (Environmentally Preferred Alternative) – Alternative 1 addresses the need to initiate reforestation treatments to restore the declining forest ecosystem, to establish tree seedlings to improve the horizontal and vertical diversity, to enhance health and vigor of forest stands, to manage in a sustainable way, to supply forest products, to provide a reasonable transportation system and to restore/enhance wildlife habitats. This alternative responds to issues regarding the level of timber harvest that should occur, the use of reforestation techniques, the amount and kind of transportation system to provide, and the choice of silvicultural system. This alternative represents the proposed action (with minor modifications) that was presented in the scoping letter and described in the Notice of Intent.

Alternative 2 - Alternative 2 addresses the need to supply forest products, to provide a reasonable transportation system and to restore wildlife habitats. This alternative responds to issues regarding the level of timber harvest that should occur, the harvest of only dead, dying or declining trees, and the amount and kind of transportation system to provide. Alternative 2 fails to address needs associated with enhancing the health and vigor of forested stands, restoring the declining forest ecosystem, does not establish tree seedlings, and does not ensure sustainable forest management. This alternative provides comparative analysis for management without consideration of the use of reforestation techniques, and without the selection of either even-aged or uneven-aged management.

Alternative 3 - Alternative 3 addresses the same needs as Alternative 1, and responds to the same issues as Alternative 1. The primary difference between these two alternatives is that no new roads are constructed and no road betterment occurs in Alterative 3. Consequently, fewer acres of timber harvest occurs. Reforestation treatments with no associated timber harvest occurs in stands where severe mortality has occurred and road access is not currently available. This alternative provides comparative analysis for management activities that limits commercial timber harvest to areas where road access currently is found, but still emphasizes the need to regenerate stands where severe mortality has occurred.

Alternative 4 - Alternative 4 addresses the same needs as Alternative 1, and responds to the same issues as Alternative 1. The primary difference between these two alternatives is that uneven-aged management is the preferred silvicultural system. Uneven-aged treatments are proposed in all stands that meet the vegetative criteria established for this silvicultural system. Salvage thinning treatments are proposed in stands that do not meet these criteria, yet have commercial harvest opportunities. Reforestation treatments with no associated timber harvest are proposed in stands where severe mortality has occurred, and vegetative criteria for uneven-aged management treatments are not found.

Alternative 5 – Alternative 5 is the No Action Alternative. No treatments would occur. This alternative does not respond to any of the needs or opportunities found within the East Side project area at this time. This alternative provides a comparative analysis for issues regarding the level of timber harvest, the use of reforestation techniques, the amount and kinds of transportation system and the selection of silvicultural systems.

Alternatives Not Considered in Detail

There were numerous requests for consideration of additional alternatives, some of which originated from public comment, others from internal sources. A complete discussion of the alternatives considered but eliminated from detailed study can be found in the East Side FEIS pp. 29 – 39. Each suggestion was given careful consideration, and eliminated from study for one or more of the following reasons:

1. The range of alternatives developed in detail provided a sufficient range of analysis, such that development of additional alternative was either redundant or not needed.
2. There was insufficient detail to indicate where an opportunity for development of the alternative was found

3. The alternative was not reasonable because silvicultural systems proposed in the alternative were extremely costly, and local research and monitoring data did not support pursuing the proposed management.
4. The alternative had been considered in a previous NEPA analysis.
5. The alternative will be considered in some future NEPA analysis.
6. The alternative is not reasonable because the proposal does not meet required criteria for consideration.

There were three well-developed alternatives presented by members of the public that also were not considered in detail in analysis. They were not considered in detail because the many of the elements of the proposals were considered in one or more of the Alternatives Considered in Detail, or because the alternative presented a management philosophy that was incompatible with Forest Plan direction, and therefore beyond the scope of the East Side analysis.

ENVIRONMENTAL CONSEQUENCES

Chapter 3 of the FEIS provides a description of the affected environment and a discussion of the environmental consequences associated with implementation of each alternative. This section contains the scientific and analytic basis for comparing the alternatives. Although some comments were made on the sufficiency of the analysis provided in the DEIS, I am satisfied that the analysis is adequate (see Appendix G – Forest Service Response to 45-Day Comments) which has been completed to the satisfaction of the Environmental Protection Agency (EPA) and in coordination with the U.S. Fish and Wildlife Service. I have considered the information provided in Chapter 3 in my decision-making process. Details pertinent to the decision are provided here.

Physical Environment

Ecological Land Types

Potentially, there are three broad environmental consequences of implementing Alternative 1 on soils and landforms: 1) surface disturbance which includes compaction, soil displacement, rutting, puddling, and erosion, and loss of landform from road construction and rock pit excavation; 2) changes in the nutrient cycling; and 3) loss of productivity in terms of a loss of growing medium from rock pit excavation and long term, but still retrievable, loss through road placements. Implementation of Alternative 1 will result in 1,735 acres of surface disturbance from the use of mechanized equipment involved in management activities, the removal of vegetation on 101 acres of forested land for road construction/reconstruction, and the change in landform on 40 acres due to rock pit development. There are 31 acres of road surface that will be decommissioned. (East Side FEIS p. 69). Carbon storage is expected to be maximized in Alternative 1 as a result of reforestation activities that establish vegetation capable of accumulating carbon, balanced with the mixture of older stands that have high carbon storage. The vegetative development that occurs in Alternative 1 is expected to have positive effects on nutrient cycling (FEIS pp. 67-68). The vegetative treatments improve the long-term productivity for the project area.

Water

The greatest potential for impacts to water quality occur from runoff from roads within 200 feet of streams or stream crossings. Activities proposed in Alternative 1 are designed to improve the condition of new and existing Forest Service roads within 300 feet of streams, and ultimately to improve water quality. After implementation of Alternative 1, there will be a total of 31 miles of Forest Service road within 300 feet of streams with limestone surfacing, and 56 stream crossings with limestone surfacing. There will be 55.1 remaining miles of Forest Service road within 300 feet of streams and 94 stream crossings that are not addressed in this project. These road segments and stream crossings will be addressed in future projects as planning and funding allow (East Side FEIS p. 94).

Transportation

Alternative 1 continues to provide a transportation system that is reasonable, and provides safe access for administrative and public use of the area. The construction of 15.2 miles of new road and the addition of a total of 33.9 miles of existing road presently under private administration is within the road density levels outlined in the Forest Plan (East Side FEIS p. 121). The use of limestone surfacing within 300 feet of streams and the improvements made to stream crossings will benefit water quality over the long term.

Oil, Gas and Minerals

There are 10 new stone pits that will be developed and 33 that will be expanded to provide surfacing for roads outside of the 300 foot stream-side zone. Addition of this surfacing will stabilize the road surface and protect the environment. This is considered to be an irretrievable, irreversible action.

Biological Environment

Vegetation

Alternative 1 addresses the need to sustain forested ecosystems within the East Side project area by treating areas where severe mortality has occurred, and by initiating treatments to improve overall health and vitality in stands where stocking levels are high or in stands where reforestation opportunities exist such that Forest Plan age class and size class objectives can be met. Even-aged management techniques are emphasized in MA 3. while uneven-aged management is used in MA 2.0. The resultant effect on vegetation is that, within treated stands, silvicultural methods are employed that promote healthy, sustainable forests. In stands where severe mortality has occurred, the mix of regeneration harvests and reforestation treatments ensures the establishment of a new stand of seedlings. In stands where light to moderate mortality has occurred, the salvage of dead, dying and declining trees helps to promote increased stand health. In stands where stocking levels are high, the reduction of stocking to more moderate levels helps maintain stand vigor and health. In stands where opportunity to achieve Forest Plan age class and size class objectives can be met, the establishment of a new stand of seedlings can be assured through the use of appropriate regeneration harvest and reforestation treatments. The combination of these treatments, along with past and future treatments has the cumulative effect of contributing towards achieving Forest Plan objectives related to forest structure, species composition, age class and size class distribution (East Side FEIS pp. 172 – 179). The short term impacts from timber harvest and reforestation treatments results in the long term sustainability of the forested ecosystem. The cumulative effect of East Side treatments in combination with past and reasonably foreseeable future activities fall within levels of activity anticipated by the Forest Plan (East Side FEIS, p. 184).

Wildlife

The composition and structure of wildlife communities are maintained with implementation of Alternative 1. Approximately 180 wildlife species that utilize early successional habitat will benefit from treatments (East Side FEIS Table 82, p. 188, p. 190). Habitat for species that utilize riparian, conifer,opening, late successional and old-growth areas is provided throughout the project area (East Side FEIS pp. 190-193).

For endangered species, no adverse effects beyond those set forth in the Biological Opinion (USDI-FWS 1999) would occur to bald eagles or Indiana bats. No adverse effects would occur to the Northern riffleshell mussel, clubshell mussel or small-whorled pogonia.

For regionally sensitive species, impacts may occur to individual timber rattlesnakes and Northern water shrews, but these impacts would not cause a loss of viability or a trend towards federal listing (East Side FEIS Appendix C, pp. 35 & 36).

Socio-Economic Environment

Heritage Resources

Heritage resource surveys taken within the project area have increased the overall understanding of past human use of this area. The 57 known heritage resource site will be protected through avoidance from any adverse impacts during project implementation.

Recreation

There are potential impacts to recreation use patterns as a result of treatments proposed in Alternative 1. While most East Side activities occur in areas where recreation use is low, there is the possibility that some recreationists will prefer to move to another location that is not disturbed by management activities during project implementation. This is an unavoidable effect if management activities are to be pursued. However, most areas and facilities on the ANF receive low to moderate recreation use indicating that supply exceeds demand. The nature of dispersed recreation is that it is flexible and based on the needs of the user and the resources of a piece of land at a given time. There is ample opportunity for recreationists to select other sites for comparable use and enjoyment. And while some recreationists are displaced as a result of management activity, others are drawn to these areas. Hunters in particular, and some wildlife observers seek areas where early successional vegetation is found (East Side FEIS pp. 240 – 246). I believe that the short-term trade-off between the displacement of some recreationists is acceptable, given the long term benefits gained from the vegetative management treatments that need to occur.

Visual/Scenic Resources

The visual quality within the project area has been impacted by the tree mortality and decline that has occurred. Mitigation measures employed in conjunction with harvest treatments have been shown to be effective in maintaining and enhancing visual quality. In the East Side project area, however, there are some existing conditions that currently do not meet visual quality standards, and in spite of visual mitigation measures to be applied during treatments, will not meet visual quality objectives in the short-term. Silvicultural treatments in these areas are designed to promote the rapid establishment of seedlings. Over time, newly established forest cover will minimize the impact on visual resources (FEIS p. 251). There are 22 groups of stands, that due to the catastrophic nature of damage, result in temporary openings that will exceed 40 acres in size, Of these, there is one block, that even with mitigation, will not meet visual quality objectives in the short term. Over time, visual impacts will lessen as vegetation becomes established and forested conditions are developed

Economics

Alternative 1 provides substantial economic return to the U.S. Treasury. The positive cash flow takes into consideration the costs of producing timber sales, road construction, reforestation activities and wildlife habitat improvements, as well as revenues generated by commercial timber sales. Alternative 1 treatments take advantage of the opportunity to harvest renewable forest resources, generate a positive cash flow, and achieve reforestation objectives (East Side EIS p. 259). Also, in the short term, 25% of the harvest value will be returned to local school districts and townships in the four county area surrounding the ANF. The long term effect of investments made now in reforestation treatments is to ensure opportunity for future management with comparable economic returns.

Human Health and Safety

In a general sense, Alternative 1 provides safer forest conditions following implementation than currently exist within the project area. The removal of dead, dying and declining trees within harvested areas reduces the total number of trees that might pose a hazard to hunters and other forest visitors who frequent wooded settings, although harvest activities do not remove all hazard trees and additional hazard trees will develop over time

through natural processes. The implementation of treatments does not create unsafe conditions within the project area or to those who use forest resources (East Side EIS pp. 262 – 266).

Irreversible/Irretrievable Commitment of Resources

Irreversible and/or irretrieval commitments of resources are limited to the removal of stone from 10 new and 33 existing pits for surfacing of roads and landings within the project area (East Side EIS p 128).

Short-term Use vs. Long-term Productivity

The discussion of direct and indirect effects, as well as cumulative effects form the basis for my determinations regarding short term uses vs. long term productivity. Chapter 3 of the FEIS discloses many effects from the implementation of this project. Some are beneficial, in that they promote the long-term achievement of the goals and objectives of the Forest Plan. Others result in minor, short term impacts that, over time will lessen. Some of the points pertaining to short-term use vs. long-term productivity have been included in the environmental consequences discussion presented in the previous section.

REASONS FOR NOT SELECTING THE OTHER ALTERNATIVES

I considered four other alternatives in detail for implementation in the East Side project area. I carefully evaluated the differences in effects as displayed in Chapter 3 of the FEIS, and I considered how each of the alternatives responded to the needs for action and opportunities within the project area.

Alternative 2

I did not select Alternative 2 because this alternative fails to address reforestation needs that exist at the present time. Based on the 'may affect' determination with respect to Indiana bat made in the Biological Assessment, it is clear that this alternative does not respond to needs of T&E species. It may also have adverse impacts on habitat for Northern long-eared bat, timber rattlesnake and Northern water shrew, but would not cause a loss of viability or a trend towards federal listing (East Side FEIS Appendix C, pp. 35 & 36). Given the window of opportunity to take advantage of available seed source and understory conditions, I believe that deferring the reforestation work to some time in the future is not prudent. To only remove dead, dying and declining trees, with no effort made to restore forested ecosystems is contrary to management philosophies presented in the Forest Plan and NFMA. The condition of vegetation that develops in this alternative fails to meet long term goals and objectives of the Forest Plan as well as the objectives of the Natural Resource agenda, particulary those associated with maintaing healthy, well stocked forested stands.

Alternative 3

The primary difference between Alternative 1 and Alternative 3 rests in the development of the transportation system. For the most part, vegetative management treatments are the same, except where new road access is needed for commercial sale activities. Individual timber rattlesnakes and Northern water shrews could be impacted under this alternative, but these impacts would not cause a loss of viability or a trend towards federal listing (East Side FEIS Appendix C, pp. 35 & 36).

I did not select Alternative 3 because I find no compelling reason to curtail the road construction or road betterment proposals made in Alternative 1. In fact, the additional road betterment activities included in Alternative 1 (limestone surfacing and stream crossings) result in improvements to more miles of road and greater numbers of stream crossings than in Alternative 3. I believe that Alternative 1 provides greater net public benefit than does Alternative 3 and is therefore more desirable than Alternative 3.

Alternative 4

Due to public interest in uneven-aged management and legal direction to consider this silvicultural system more fully, I gave considerable thought to the selection of Alternative 4. Ultimately, however, I did not select this alternative. The debate over the kind of silvicultural system to emphasize on the ANF did not originate with the East Side project. The analysis completed for the Forest Plan included a detailed look at the trade-offs between even-aged and uneven-aged management, including the effects on dispersed recreation, timber harvest volumes

and values, and effects on wildlife habitat. The selection of Forest Plan FEIS Alterative D was based on the programmatic decision to emphasize even-aged management in MA 3.0 and uneven-aged management in MA 2.0, and was made because it provided the best mix of goods, services, and uses to the public (maximizes net public benefit per 36 CFR Part 219.1).

As part of the background work for this project, I directed the Forest Silviculturist to examine new research findings pertaining to uneven-aged management, and to assess local application and results of uneven-aged treatments. This review did not cause me to question the Forest Plan analysis, therefore I believe the conclusions reached in the Forest Plan are still valid. Success of this silvicultural practice on a large scale is uncertain. There is a likelihood that desired outcomes would not occur even after significant expenditure of funds. Much reliance would have to be placed on experimental or adaptive management techniques. The following provides additional rationale:

1. The limitations and uncertainty with uneven-aged management in the predominant vegetation types within East Side reduce the opportunity to address more fully the purpose and need within the project area. Alternative 1 offers a broader range of activities to meet Forest Plan direction as provided in MA 3.0.
2. The biology and site requirements of existing shade-intolerant species in even-aged stands do not lend themselves to the application of uneven-aged techniques, increasing the cost of implementation.
3. Several of the shade-tolerant tree species are experiencing decline (maple) or disease (beech). Creating larger acreages of these species through uneven-aged management could result in greater susceptibility of the forest to insect and disease outbreaks. Alternative 1 (and 3) offers an opportunity to maintain a more sustainable forest.
4. Alternative 4 has a cost/benefit ratio of less than one for the major management activities, making it a less desirable choice.
5. Alternative 4 is not as effective, nor is it as reliable, in moving the East Side project area towards the desired future condition as described in the Forest Plan. Importantly, the analysis in the FEIS does not describe attributes of this alternative that lead me to the conclusion that the affected resources in the East Side project would be better served by deviating from the current Forest Plan direction for MAs 3.0 and 6.1.

The environmental conditions within the East Side project area, and more specifically, the particular vegetative conditions within the stands proposed for treatment do not suggest that deviating from programmatic Forest Plan direction (to apply uneven-aged management treatments broadly throughout MA 3.0) is warranted.

Individual timber rattlesnakes and Northern water shrews could be impacted by this alternative, but these impacts would not cause a loss of viability or a trend towards federal listing (East Side FEIS Appendix C, pp. 35 & 36).

The vegetative conditions that result from implementation of Alternative 4 do not contribute towards achieving the desired future condition as described in the Forest Plan, and due to the uncertainty of implementing uneven-aged management on such a large scale, do not contribute towards objectives of the Natural Resource agenda. Therefore, I did not select Alternative 4.

Alternative 5

We are required to consider the 'No Action' alternative in environmental analysis as specified in the National Environmental Policy Act (NEPA). It provides a comparitive baseline, which can be effective in the evaluation of effects of alternatives that propose actions. The analysis of this alternative was as rigorous as analysis of other alternatives. Based on the 'may affect' determination with respect to Indiana bat made in the Biological Assessment, it is clear that this alternative does not respond to needs of T&E species. It may also have adverse impacts on habitat for Northern long-eared bat but it would not cause a loss of viability or trend toward federal listing because of the wide-spread distribution of this species across the ANF (East Side FEIS Appendix C, pp. 35 & 36). I did not select Alternative 5 because it is not responsive to the needs for action or opportunities that exist within the East Side project area, does not support the objectives of the Natural Resource agenda and does not maximize net public benefit.

FINDINGS REQUIRED BY OTHER LAWS

Consistency with the Forest Plan

The Forest Plan was approved in March 1986 by former Regional Forester, Larry Henson. The selected alternative for the Forest Plan (Alternative D) was documented in a 1986 FEIS and Record of Decision. The Forest Plan is the guide for the management and use of the ANF and, as such, identifies a desired mix of resource conditions and outputs that maximize net public benefits. The Forest Plan was developed as required by the National Forest Management Act of 1976 (NFMA). Direction and guidance in law and regulations requires that the Forest Plan be amended as necessary. To date, 11 amendments to the Forest Plan have been processed.

The East Side Project Area contains Management Areas (MAs) 2.0 (1%), 3.0 (83%), 6.1 (8%), and 6.2, 7, and 8 (collectively 8%). Vegetative management activities are proposed in MAs 2.0, 3.0 and 6.1. A complete description of the goals and objectives for MA 2.0 are described in the Forest Plan on pages 4-70 through 4-82, for MA 3.0 on pages on pages 4-82 through 4-96, for MA 6.1 on pages 4-110 through 4-124, for MA 6.1 on pages 4-110 through 4-124, and for MA 8.0 on pages 4-169 through 4-179.

The primary purpose of MA 2.0 is to: 1) provide a continuous, forested scene through the practice of uneven-aged management which would promote tolerant species and produce quality sawtimber, feature wildlife species associated with shade tolerant vegetation, primarily songbirds and cavity nesting birds and mammals, and provide the opportunity for a variety of developed and dispersed motorized recreation opportunities in a Roaded Natural setting.

The primary purposes of MA 3.0 are to: 1) provide a sustained yield of high quality Allegheny hardwood and oak sawtimber through even-aged management, 2) provide a variety of age- or size-class habitat through diversity from seedling to mature sawtimber in a variety of timber types, 3) emphasize deer and turkey in all timber types and squirrel in the oak type, and 4) provide a roaded, natural setting for all types of developed and dispersed recreation opportunities, with an emphasis on motorized recreation activities.

The primary purposes of MA 6.1 are to: 1) maintain and enhance scenic quality, 2) emphasize a variety of dispersed recreation activities in a semi-primitive motorized setting, and 3) emphasize wildlife species which require mature or over-mature hardwood forests, such as turkey, bear, cavity-nesting birds, and mammals.

The primary purpose for Kane Experimental Forest (M.A. 8.0) is to provide an area where we will conduct research to improve the benefits of the forest. The Northeastern Research Station at Irvine conducts research projects and training on the Kane Experimental Forest (KEF).

Alternative 1 proposes activities with mitigations that are consistent with the management direction of the Forest Plan. The analysis of Alternative 1 discloses effects that are consistent with those projected in the Forest Plan analysis.

National Forest Management Act (NFMA)

The National Forest Management Act of 1976 and the resulting Secretary's Regulations (36 CFR 219.15) require that vegetation management practices be chosen that are appropriate to meet the objectives and requirements of the Land and Resource Management Plan. The use of even-age management is appropriate for the regeneration of species and forest types found on the ANF.

White tailed deer cause extensive damage by feeding on seedlings of tree species found on the ANF. Only even-aged methods that provide abundant sunlight enabling seedlings to quickly grow out of the reach of deer are practical. Even then, reforestation practices (such as fencing, fertilization, and site preparation) are often necessary. The choice of silvicultural systems would be wider were in not for the unusually high deer browsing that occurs on the ANF. Clearcutting provides the optimal response. In one step, it provides abundant sunlight to existing tree seedlings permitting them to rapidly develop. Shelterwood systems are also an appropriate means of establishing seedlings and providing conditions that allow for the rapid growth of seedlings. (Forest Plan, p. D7-9)

Clearcutting is the optimum method for maintaining aspen due to its intolerance for shade and it physiological requirements for suckering. Both seedling and root suckers are intolerant of shade; those that fall below the canopy stop growing and die within a few years (Forest Plan, p. D-6).

Vegetation management activities in this project will improve age-class distribution, increase species diversity, and move the project area towards the desired future condition for MAs 2.0, 3.0, 6.1, and 8.0 as described in the Forest Plan. This project, therefore, is consistent with the National Forest Management Act (NFMA) direction for Management Requirements [36 CFR 219.27(a)-(g)]. In particular, these management activities will, in the long term, be ecologically acceptable and compatible with the forest ecosystem and the multiple use objectives of the plan. These activities will protect streams, stream banks, and wetlands provide for and maintain diversity of plant and animal communities to meet overall multiple use objectives; and include measures for preventing the destruction or adverse modification of critical habitat for threatened and endangered species.

Vegetative management activities, including salvage harvest and reforestation treatments, that are made in response to tree mortality and decline are consistent with 36 CFR 219.27(a)(3). The salvage harvest and subsequent reforestation of severely impacted areas will result in stands that are in a healthier, more resilient state.

Due to natural catastrophic conditions caused by insect, disease, and climatic events, there are 22 blocks proposed for final harvests (shelterwood removals or clearcuts) that will form a contiguous area greater than 40 acres. This action is allowed by and is consistent with 36 CFR 219.27(d)(2)(iii).

Upon completion of this project, land classed as suitable for timber production under the Forest Plan will be reduced by about 18 acres due to clearing for permanent wildlife openings and by about 40 acres due to development and expansion of rock pits. While these lands may be lost to timber production, NFMA recognizes that certain lands are cleared for "wildlife habitat improvement, vistas, recreation uses, and similar practices" [36 CFR 219.27(b)(2)].

NFMA requires that fish and wildlife habitat be managed to maintain viable populations of existing native and desired non-native vertebrate species [36 CFR 219.19]. Species with viability concerns have been identified as "sensitive species" and potential impacts have been identified in the Biological Assessment found in Appendix C. Individual timber rattlesnakes or Northern water shrews could be impacted under Alternative 1. However, these impacts would occur to individuals and would not cause a loss of viability or establish a trend towards federal listing.

Threatened and Endangered Species Act (ESA)

The project area has been surveyed for the existence of Federally Threatened and Endangered Species and/or their habitat. There is no federally designated critical habitat for any T&E species found in the East Side project area. A Biological Assessment (BA) has been completed and reviewed by the U.S. Fish and Wildlife Service (East Side FEIS Appendix C). Based upon the analysis of effects presented in the BA, under Alternative 1, there are no adverse affects anticipated to the Small whorled Pogonia, Bald Eagle, Indiana Bat, Northern Riffleshell Mussel, or Clubshell Mussel beyond those set forth in the June 1, 1999 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 (BO). Additionally, all federal actions proposed under Alternative 1 comply with terms and conditions set forth in the BO. A letter of concurrence for the project was received from U.S. Fish and Wildlife Service on December 5, 2000.

Other Relevant Laws

I have considered all the other relevant laws and regulations that may affect this project. This includes, but is not limited to, the Weeks Act of 1911, the Multiple Use-Sustained Yield Act of 1960, the Clean Air act as amended, the Clean Water Act, Protection of Wetlands Executive Order 11990, Exotic Plants Executive Order 11987, The Safe Drinking Water Act, The National Historic Preservation Act of 1966, as amended, and The Native American Religious Freedom Act, as outlined by the Secretary of Agriculture requirements. In addition, I have considered the relevant planning documents (i.e., Forest Plan) in relationship to the project and find that the project is in compliance with these documents. I have fully considered the effects of the project on the public, as well as the

public's concerns/issues brought forward during the two comment periods (scoping, DEIS review) and feel that these concerns/issues are adequately addressed in the FEIS with Appendices and/or this ROD. I have determined that my decision to approve the project, with all necessary mitigation measures, meets all applicable laws, regulations, and land policies, as well as Forest Service direction and guidance as outlined in the Forest Service Manuals and Handbooks.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The specification of the environmentally preferred alternative or alternatives is required by the regulations for implementing the procedural provisions of the National Environmental Policy Act [40 CFR 1505.2(b)]. A review of the National Environmental Policy Act (NEPA) of 1969 was completed to determine the criteria for the environmentally preferred alternative. I have reviewed the six criteria found in NEPA 101(b) and found Alternative 1 to be the environmentally preferred alternative. The environmental benefits of Alternative 3 are very similar to Alternative 1. Both create short-term disturbances that result in long-term benefits. Alternatives 2, 4 and 5 have less desirable environmental and social outcomes within the management areas as defined by the Forest Plan.

Section 101(b) states, "In order to carry out the policy set forth in this Act, it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may:

1. "fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;" - Alternative 1 prescribes protection and maintenance activities that result in the perpetuation of a sustainable forest that is healthy and diverse and one that provides economic and social benefits for the citizens of this Nation.
2. "assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;" - The component parts of Alternative 1 provide for safe roads and a healthy, diverse, productive forest that offers a variety of vegetation types of different sizes and age classes. Mitigation measures adequately address any short-term adverse effects that result from management activity. Long-term, culturally pleasing surroundings provide for a variety of recreational opportunity. Road restoration work (and some road decommissioning) will contribute toward safer road conditions and healthier watersheds.
3. "attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;" - Alternative 1 most directly moves the project area towards the desired future condition, generating a host of desired outcomes, as described by the Allegheny National Forest Management Plan. It creates beneficial uses while still providing protection and enhancement features that ensure long-term sustainability. Management prescriptions rely on current science and technology that can be depended upon to produce dependable results. Proposed management actions also include conservative, innovative techniques that test new ideas without compromising long term productivity of the land.
4. "preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice;" - Alternative 1 provides for the preservation of historic and cultural resources and the protection of natural resources, including threatened and endangered species. The effects analysis of the FEIS describes the development of a more diverse vegetative environment that provides for a wider range of flora and fauna, compared with that predicted by the other alternatives. Road and trail management provides for freedom of access, a roaded natural experience, and the opportunity for remoteness.
5. "achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and" - Of all the alternatives, Alternative 1 provides the greatest quantities of high-valued forest products that improve the economic well-being of the local and regional area. As a result, consumers nationwide benefit from products made available through secondary

processing. With implementation of Alternative 1, non-consumptive users will continue to enjoy a diverse, productive, and sustainable forest. While controversy exists over some of the practices to be implemented, ultimately, this alternative provides a wide sharing of the values of the forest.

6. "enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources." - Management prescriptions within Alternative 1 are predicted to provide for the most successful regeneration of the forest while at the same time utilizing the products produced therefrom. Other alternatives are less effective at capturing the economic and commodity benefit. Proposed activities will maintain and enhance riparian dependant resources and promote healthy watersheds by correcting existing problems.

In summary, I have reviewed the six criteria listed above, both individually and collectively, within the context of the East Side FEIS and find that Alternative 1 is the environmentally preferred alternative. While each of the alternatives considered has desirable attributes, the activities proposed within Alternative 1 ultimately move the project area closer to the desired future conditions as described in the Forest Plan. The Plan is presently our best descriptor of the desired outcomes for the project area. An analysis of the alternatives within the FEIS shows full consideration of the purpose and need for the activities, as well as, a responsiveness to the issues raised by resource specialists and the public. Alternative 1 fulfills the Forest Service responsibility under ESA, NFMA, and NEPA. The East Side project provides for multiple use and sustained yield of goods and services in a way that maximizes long-term net public benefits in an environmentally sound manner.

PROJECT IMPLEMENTATION

Implementation on National Forest System Lands and Appeal Opportunity

My decision to authorize those activities on National Forest Service lands, as documented in this Record of Decision, is subject to appeal under the provisions of 36 CFR 215. A written Notice of Appeal must be postmarked and submitted within 45 days after the publication of the Notice of Availability in the Federal Register. Appeals must meet the content requirements of 36 CFR 215.14. The Notice of Appeal must be sent to:

USDA Forest Service, Eastern Region
Attn. Appeals Deciding Officer
310 W. Wisconsin Avenue
Milwaukee, WI 53203

If no appeal is received, the implementation on National Forest lands may occur on, but not before, 5 (five) business days from the close of the appeal filing period. If an appeal is received, implementation may not occur until 15 days following the date of the appeal decision.

Contact Person

For further information, contact:

Carl Leland, ID Team Leader
Allegheny National Forest
R.D. 1, Box 28-A
Ridgway, PA 15953
814-776-6172

APPROVAL

_____ _____

MICHAEL L. HAMPTON Date
Acting Forest Supervisor

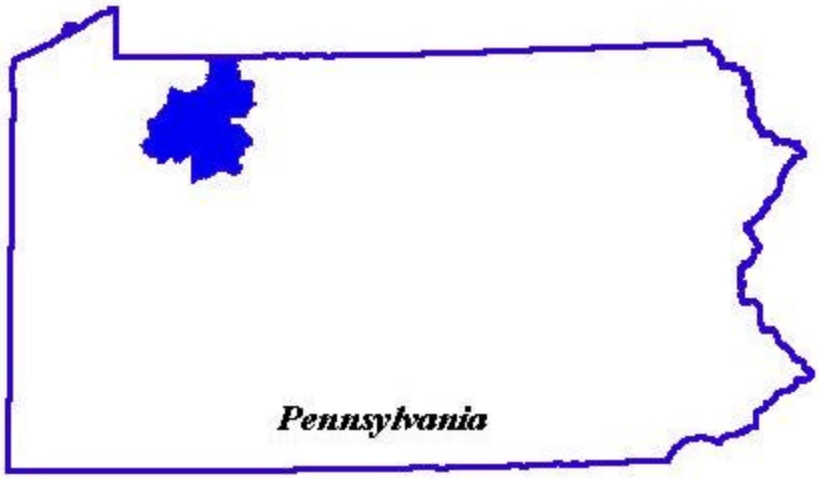
Table of contents

INTRODUCTION 1
ENVIRONMENTAL IMPACT STATEMENT 1
PURPOSE AND NEED 1
Purpose 1
Need For Action 2
DECISION 3
ANALYSIS PROCESS 4
AUTHORIZATION OF ALTERNATIVE 1 4
DESCRIPTION OF ALTERNATIVE 1 6
Proposed Activities 7
Transportation Activities 7
Wildlife Treatments 8
Timber Outputs 8
MITIGATION MEASURES 9
MONITORING REQUIREMENTS 9
PUBLIC INVOLVEMENT 9
ISSUES 10
ALTERNATIVES 10
Alternatives Considered In Detail 11
Alternatives Not Considered In Detail 11
ENVIRONMENTAL CONSEQUENCES 12
Physical Environment 12
Ecological Land Types 12
Water 12
Transportation 13
Oil, Gas And Minerals 13
Biological Environment 13
Vegetation 13
Wildlife 13
Socio-Economic Environment 14
Heritage Resources 14
Recreation 14
Visual/Scenic Resources 14
Economics 14
Human Health And Safety 14
Irreversible/Irretrievable Commitment Of Resources 15
Short Term Use Vs. Long Term Productivity 15
REASONS FOR NOT SELECTING THE OTHER ALTERNATIVES 15
Alternative 2 15
Alternative 3 15
Alternative 4 15
Alternative 5 16
FINDINGS REQUIRED BY OTHER LAWS 17
Consistency With The Forest Plan 17
National Forest Management Act (NFMA) 17
Threatened And Endangered Species Act (ESA) 18

Other Relevant Laws 18
ENVIRONMENTALLY PREFERRED ALTERNATIVE 19
PROJECT IMPLEMENTATION 20
Implementation On National Forest System Lands And Appeal Opportunity 20
Contact Person 20
APPROVAL 20

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE EAST SIDE PROJECT

DECEMBER 2000



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

This document is available in large print.
Contact the Supervisor's Office 1-814-723-5150

The United States Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political affiliation, sexual orientation, and marital or familial status (not all prohibited bases apply to all programs). Persons with disabilities who require alternative means of communication or program information (Braille, large print, audiotape, etc.) should contact the USDA's TARGET Center at 202/720-2600 (voice or TDD).

To file a complaint of discrimination, write the USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, Washington, DC, 20250-9410 or call 202/720-5964 (voice or TDD). The USDA is an equal opportunity provider and employer.

Printed on Recycled Paper

Environmental Impact Statement
for the
East Side Project

Elk, Forest, McKean, and Warren Counties, PA

December 2000

Lead Agency: **USDA- Forest Service, Allegheny National Forest**

Responsible Official: **Michael Hampton, Acting Forest Supervisor**
Allegheny National Forest
P.O. Box 847
Warren, PA 16365
814-723-5150

For Further Information, Contact: **Carl Leland, ID Team Leader**
Allegheny National Forest
R.D. 1 Box 28-A
Ridgway, PA 15853
814-776-6172

Abstract:

The East Side project area is located on both the Bradford and Marienville Districts of the Allegheny National Forest. From 1991 through 1996, a series of defoliations caused by elm spanworm and forest tent caterpillar occurred over a wide area of the northern tier of Pennsylvania. During that six-year period, a substantial portion of the East Side project area was repeatedly defoliated. By 1994, FS personnel began to observe sizeable areas of tree mortality and decline, particularly in Sugar and red maples, American beech, birch, and white ash species. The *Environmental Assessment of Tree Mortality and Ecosystem Sustainability on the Allegheny National Forest, June 1995* addressed the areas with the most severe mortality. The East Side EIS is a continuation of the analyses addressing tree mortality and decline, ecosystem sustainability, and promotion of healthy forested ecosystems in additional severe mortality areas. Following a review of agency and public comments, five unresolved issues were identified which centered around the topics of harvest levels, silvicultural systems, road activity levels, and reforestation measures. The unresolved issues led to the development of five alternatives considered in detail, including no new federal action. Each alternative proposed varying degrees of timber harvest, reforestation work, wildlife improvement, and/or road construction work. This Final EIS documents the effects of implementing the activities associated with each alternative on various Allegheny National Forest resources. The Forest Supervisor, the deciding officer, chose Alternative 1 for implementation. This decision is appealable per 36 CFR 215 regulations. Appeals must be filed within 45 days folowing the publication of the Notice of Availability in the Federal Register. Appeals must meet the content requirements of 36 CFR 215.14.

Table of Contents

CHAPTER 1 - PURPOSE OF AND NEED FOR ACTION 1

Project Overview 1

Background 1

Purpose And Need 2
Purpose of the Proposal 2
Management Area 2.0 3
Management Area 3.0 4
Management Area 6.1 5
Management Area 8.0 (Kane Experimental Forest) 5
Need for the Proposal 5

Public Involvement and Issue Development 8
Scoping 8
Issues Used to Formulate Alternatives 8
Issue: What level of timber harvest should occur in the East Side Project Area? 8
Issue: Should only dead, dying, and damaged trees be salvage harvested? 9
Issue: Should herbicides and other reforestation treatments be used to help sustain forest cover in declining forest ecosystems? 9
Issue: What level of construction of new roads and reconstruction of existing roads should be implemented in the project area? 9
Issue: Should even-aged management or uneven-aged management silvicultural systems be used in the project area? 10

Relationship To Other Documents 11

Cooperating Agencies 12
U.S. Department of Interior, Fish and Wildlife Service 12
U.S. Department of Interior, National Park Service 12

Decision To Be Made 12

CHAPTER 2 - ALTERNATIVES 13

Formulation of Alternatives 13
Vegetation 14
Green versus Salvage 14
Regeneration Harvests 14
Even-aged Regeneration Harvests 14
Uneven-aged Harvests 15
Intermediate Harvests 16
Even-aged Thinning Harvests 16
Reforestation Only 16
Reforestation Treatments 16
Transportation 17
Wildlife Treatments 17

Descriptions of Alternatives Considered in Detail 18
Kane Experimental Forest Proposals 18
Alternative 1 (Proposed Action) 19
Proposed Activities 19
Vegetative Treatments 19
Transportation Activities 21
Wildlife Treatments 21
Timber Outputs 22
Alternative 2 22
Proposed Activities 22

Vegetative Treatments 22
Transportation Activities 22
Timber Outputs 23
Alternative 3 23
Proposed Activities 23
Vegetative Treatments 23
Transportation Activities 25
Wildlife Treatments 25
Timber Outputs 25
Alternative 4 26
Proposed Activities 26
Vegetative Treatments 26
Uneven-Aged Management 26
Transportation Activities 27
Wildlife Treatments 28
Timber Outputs 28
Alternative 5: No New Federal Action 28

Alternatives Considered But Eliminated From Detailed Study *29*
Vegetation Management 29
Size of Project Area 29
Uneven-aged Management 30
Summary of Forest Plan Analysis 30
Literature Review, Research Review, and Local Success 31
Herbicide Use 32
Old Growth 32
Wildlife 33
Recreation 33
Research Natural Area 34
Public Alternative 1 – No Logging, Zero Cutting, Maximize Watershed Protection, Maximize Old Growth, Obliterate Roadways 34
Public Alternative 2 - Watershed Improvement Alternative (Source: public comment). 35
Public Alternative 3 - Ecological Restoration Alternative (Source: public comment.) 38

Comparison of Alternatives *40*
Comparison of Alternatives to the DFC for each Management Area 40
Comparison of Alternatives to the Project Needs 42
Comparison of the Alternatives to the Issues 45
Comparison Of Alternatives By Resource 48
Physical Environment 48
Ecological Landtypes 48
Water 49
Transportation 49
Oil, Gas, and Minerals 49
Biological Environment 50
Vegetation 50
Wildlife 51
Social Environment 52
Heritage 52
Recreation 52
Visual/Scenic 52
Economic 52
Human Health and Safety 53

Preferred Alternative *53*

Chapter 3 - AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES 54

Changes in Analysis Between Draft EIS and Final EIS *54*

Organization of Chapter 3 ..... *54*
Affected Environment 55
Environmental Consequences 55
Direct/Indirect Effects 55
Cumulative Effects 55
Summary of Mitigation Measures and Effectiveness 56

Ecological Landtypes *57*
Affected Environment 57
Ecological Mapping Units 57
ELTPs to Describe Soils 59
ELTPs to Identify Riparian Areas 59
Environmental Consequences 62
Direct/Indirect Effects 62
No Action Alternative 64
Action Alternatives 64
Cumulative Effects 70
Summary of Mitigation Measures and Effectiveness 72

Water and Watersheds *74*
Affected Environment 74
Water-Road Interaction 75
Watershed Descriptions 76
Bear Creek Watershed 78
Big Mill Creek Watershed 78
Clarion River Watershed 78
Kinzua Creek Watershed 79
South Branch Tionesta Creek Watershed 79
Spring Creek Watershed 80
Sugar Run Watershed 80
Tionesta Creek Watershed 81
West Branch Clarion River Watershed 81
West Branch Tionesta Creek Watershed 82
West Branch Tunungwant Creek Watershed 82
Environmental Consequences 83
Direct/Indirect Effects 83
Water-Herbicide Interaction 83
Water-Harvesting Interaction 83
Road-Water Interaction 84
Watershed Descriptions 86
Bear Creek 86
Big Mill Creek 86
Clarion River 87
Kinzua Creek 88
South Branch Tionesta Creek 89
Spring Creek 90
Sugar Run Watershed 90
Tionesta Creek Watershed 91
West Branch Tunungwant Creek Watershed 92
West Branch Clarion River Watershed 92
West Branch Tionesta Creek Watershed 93
Cumulative Effects 94
Bear Creek 95
Big Mill Creek 96
Clarion River 97
Kinzua Creek 98
South Branch Tionesta Creek 99
Spring Creek 100

Sugar Run Watershed 101
Tionesta Creek Watershed 102
Tunungwant Creek Watershed 103
West Branch Clarion River Watershed 104
West Branch Tionesta Creek Watershed 105
Summary of Mitigation Measures and Effectiveness 105

Transportation *106*
Affected Environment 106
Road Density 106
Road Management 107
Environmental Consequences 108
Direct/Indirect Effects 108
Road Density 120
Road Management 121
Cumulative Effects 122
Summary of Mitigation Measures and Effectiveness 127

Oil, Gas, and Minerals *128*
Affected Environment 128
Environmental Consequences 128
Direct and Indirect Effects 128
Cumulative Effects 129
Summary of Mitigation Measures and Effectiveness 129

Vegetation *130*
Affected Environment 130
Section 1: Vegetative Historical Perspective 130
Vegetation Associations 130
Natural Disturbance 130
Droughts 131
Harvesting 131
Deer Browsing 131
Recent Management Activity 132
Forest Health History 133
Private Land 137
Section 2: Biological Diversity Concepts 138
Species Diversity 138
Genetic Diversity 139
Ecosystem/Landscape Diversity 139
Section 3: Project Area and Treatment Area Composition and Structure 140
Dead and Live Tree species Composition, Sizes, and Abundance 140
Forest Types/Age Class 140
Relative Density 144
Midstory/Understory 144
Late Successional Forest/Old Growth 146
Potential for Uneven-Aged Management 147
Forest Plan Direction 147
Feasibility of Uneven-aged Management 148
Environmental Consequences 149
Direct/Indirect Effects 149
Section 1: Effects of Individual Vegetation Treatments on Vegetation 149
Summary of the Direct/Indirect Effects from Individual Activities Proposed in the Alternatives 149
Direct and Indirect Vegetative Effects from listed Activities or No Treatment 151
Section 2: Direct/Indirect Effects From the Combination of All Treatments Proposed on Sites, by Alternative 171
Projected Composition and Structure of Overstory Vegetation 171
Projected Composition and Structure of Understory/Midstory Vegetation 176
Projected Composition and Structure of Late Successional Forest/Old Growth 179

Cumulative Effects 180
Cumulative Effects from Harvest Treatments 180
Cumulative Treatment Amounts 181
Age Class and Forest Type Distribution 183
Age Class Distribution 183
Forest Type 185
Relative Density 185
Understory Vegetation/Midstory Vegetation Tree Seedlings 185
Dead and Live Trees 186
Summary Of Mitigation Measures And Effectiveness 186

Wildlife *187*
Affected Environment 187
Method of Analysis 187
Composition and Structure of Communities 187
Early Successional Forest 190
Mature and Late Successional Forest 190
Old Growth 190
Coarse Woody Debris 191
Conifer 192
Non-Forest 192
Riparian Habitat 192
Aspen 193
Management Indicator Species (MIS) 193
Early Successional Species 194
Mature/Late Successional Forest Species 196
Mature Mixed Conifer Species 197
Species Requiring Regenerating Conifer 198
Cavity-Nesting Species 199
Upper, Intermediate Canopy (3-20 ft.), and Ground-nesting Species 199
Species Preferring Aspen 200
Aquatic Species 200
Unique and Uncommon Plant Communities 202
Landscape Patterns 202
Fragmentation 205
Threatened, Endangered, and Regionally Sensitive Species 205
Environmental Consequences 206
Direct and Indirect Effects of Treatments 206
Even-aged Intermediate Harvests 206
Even-aged Regeneration Harvests 207
Uneven-aged Regeneration Harvests 209
Individual Tree Selection Harvest 209
Group Selection Harvest 209
Effects of Reforestation Treatments 210
Herbicide Application 210
Area Fencing 210
Fertilization 211
Site Preparation 211
Planting 211
Effects on Future Old Growth and Late Successional Forest Habitat 212
Wildlife and Fish Habitat Improvement 212
Direct Mortality on Wildlife 214
Changes in Available Habitat within the Small Watersheds 215
Riparian/Specialized Habitat 217
Changes in Available Habitat for MIS 218
Early Successional Species 218
Mature/Late Successional Forest Species (51 - 110 year age class) 218
Mature Mixed Conifer Species 219

Species Requiring Regenerating Conifer....219
Cavity-Nesting Species....220
Species Preferring Aspen....220
Upper, Intermediate Canopy (3-20 ft) and Ground Nesting Species....220
Aquatic Species....220
Effects on Unique Plant Communities....221
Fragmentation....221
Cumulative Effects....223
Oil and Gas Development....224
Timber Harvest....226
Genetic Diversity....227
Fragmentation....227
Threatened, Endangered, and Sensitive Species....228
Summary of Determinations....228
Summary of Mitigation Measures and Effectiveness....229

Heritage Resources....230
Affected Environment....230
Prehistoric Heritage Resource Sites....230
Historic Heritage Resource Sites....232
Environmental Consequences....235
Direct/Indirect Effects....235
Cumulative Effects....235
Summary of Mitigation Measures and Effectiveness....236

Recreation....237
Affected Environment....237
Recreation Opportunity Spectrum....237
Areas of Concentrated Recreation Use....238
Facilities....238
Sensitivity Levels....239
Unique Features....239
Dispersed Camping....239
Hunting and Fishing....239
Environmental Consequences....240
Direct/Indirect Effects....240
Recreation Opportunity Spectrum....240
Areas of Concentrated Recreation Use....240
Facilities....241
Sensitivity Levels....243
Dispersed Camping....243
Unique Features....243
Hunting and Fishing....243
Cumulative Effects....244
Recreation Opportunity Spectrum....244
Areas of Concentrated Recreation Use....244
Summary of Mitigation Measures and Effectiveness....246

Visual/Scenic Resources....247
Affected Environment....247
Visual Quality Objectives....247
Scenic Integrity....248
Environmental Consequences....249
Direct/Indirect Effects....249
Alternative 1....251
Alternative 2....251
Alternative 3....252
Alternative 4....252
Alternative 5 - No Action....253

Cumulative Effects 253
Summary of Mitigation Measures and Effectiveness 254

Economics *255*
Affected Environment 255
Environmental Consequences 258
Direct/Indirect Effects 258
Cumulative Effects 260
Summary of Mitigation Measures and Effectiveness 261

Human Health And Safety *262*
Affected Environment 262
Environmental Consequences 263
Direct/Indirect Effects 263
Cumulative Effects 265
Summary of Mitigation Measures and Effectiveness 266

Chapter 4 INDEX 267

Chapter 5 REFERENCES 273

Chapter 6 GLOSSARY 284

Chapter 7 LIST OF PREPARERS AND TECHNICAL CONSULTANTS 304

LISTING OF TABLES AND FIGURES

Figure 1. Percentage of basal area by Tree Status for Stands with significant Forest Decline Symptoms on the Allegheny National Forest 136
Figure 2. Percent of Basal Area Per Acre by Tree Status and Species/Species Group for Stands with Significant Forest Decline Symptoms on the Allegheny National Forest. 136

Table 1. Comparison of Desired Future to Existing Conditions MA 2.0 3
Table 2. Comparison of Desired Future to Existing Conditions MA 3.0 4
Table 3. Comparison of Desired Future to Existing Conditions MA 6.1 5
Table 4. Kane Experimental Forest Treatments 18
Table 5. Alternative 1: Total Vegetation Treatments (acres) 20
Table 6. Alternative 1: Proposed Transportation System Activities (miles, # of pits) 21
Table 7. Alternative 1: Wildlife Treatments (acres) 21
Table 8. Alternative 2: Modified Salvage Thinning (acres) 22
Table 9. Alternative 2: Proposed Transportation System Activities (miles, # of pits) 22
Table 10. Alternative 3: Total Vegetative Treatments (acres) 24
Table 11. Alternative 3: Proposed Transportation System Activities (miles, # of pits) 25
Table 12. Alternative 3: Wildlife Treatments 25
Table 13. Alternative 4: Total Vegetative Treatments (acres) 27
Table 14. Alternative 4: Proposed Transportation System Activities 27
Table 15. Alternative 4: Wildlife Treatments 28
Table 16. Comparison of DFC to EC and Future Condition by Alternative for MA 3.0 40
Table 17. Comparison of DFC to EC and Future Condition by Alternative for MA 2.0 41
Table 18. Comparison of DFC to EC and Future Condition by Alternative for MA 6.1 41
Table 19. Summary Comparison and Responsiveness of Alternatives to the Needs and Opportunities Identified for the East Side Project 42
Table 20. Comparison of Issues By Alternative 45
Table 21. Summary of Activities Affecting Soils and Landforms by Alternative 48
Table 22. Ecological Hierarchy for the East Side Project 57
Table 23. ELTp And Landforms: Distribution By Project Area And Proposed Treatment Areas 60
Table 24. Summary of Landforms--Percent Affected by Timber Harvest by Alternative 62
Table 25. Potential Short and Long Term Carbon Consequences; Resulting Percentage of Treatments with Densities Greater than 60%; and Total Harvest Volumes 65
Table 26. East Side Activities and Acres of Potential Surface Disturbance 69
Table 27. Potential Cumulative Effects of Land Management Treatments 71
Table 28. Watersheds with Proposed Vegetation Treatments and Road Activity. 74
Table 29. Sources Of Potential Sediment: Number Of Road Miles Within 300' Of A Stream And Number Of Road-Stream Crossings For The East Side Project Area. 77
Table 30. Summary of Proposals for the East Side Project Area 85
Table 31. Summary of Road/Water Interactions for the East Side Project Area 86
Table 32. Summary of Cumulative Road/Water Interactions for the Eleven Watersheds 94
Table 33. Existing Conditions: Road Density by Management Area for Various Road and Trail Categories 107
Table 34. Existing Conditions: Miles of each TSL for various road and trail categories 107
Table 35. Percentage of FS Roads by Road Management Objective for the Existing Condition 108
Table 36. Road Activity /Estimated Clearing/ Map Code and Notes by Road Segment by Alternative 110
Table 37. Miles of FS Road by Road Management Objective for Each Alternative 120
Table 38. Road Density by Management Area for FS and OGM Roads on System by Alternative 121
Table 39. Percentage of FS Roads by Road Management Objective for Each Alternative 122
Table 40. Construction and Reconstruction by MA-Forest Plan Standards and Guidelines 123
Table 41. Miles of Construction/Reconstruction By Management Area 124

Table 42. Cumulative Impacts: Road density for Management Area 3.0 for FS and OGM roads on system by Alternative 126
Table 43. Cumulative Effects of Road Construction and Reconstruction 127
Table 44. Cumulative Effects: Percentage of FS Roads by Road Management Objective for Each Alternative 127
Table 45. Stone Pit Development Activities And Clearing Acres 128
Table 46. ANF Management Activities within the 139,990-acre East Side Project Area, 1986-1998 132
Table 47. Summary of Insect Spraying and Naturally Occurring Stresses on Forest Vegetation - East Side Project Area (1984-1999) 134
Table 48. Cumulative Defoliation within East Side Project Area - 1984 through 1999 134
Table 49. East Side Project Area Forest Type/Management Area Summary 141
Table 50. Forest Type Changes from Tree Mortality/Decline during the Past Five Years in Stands Proposed for Treatment 142
Table 51. East Side Project Area Age Class/Management Area Composition 143
Table 52. East Side Project Treatment Areas - Summary (acreage) of Present Age Classes 143
Table 53. East Side Project Treatment Areas - Changes in Stand Relative Density Resulting from Tree Mortality/Decline 144
Table 54. Summary of MA 3 Understory Vegetation Conditions on the ANF from Plot Data Collected on 6,000 Plots in 1992 145
Table 55. East Side Project Treatment Areas - Present Stocking of Plants Which Interfere with Tree Seedling Development 145
Table 56. East Side Project Treatment Areas - Summary of Present Understory Woody Vegetation 146
Table 57. Present Condition for Stands > 111 Years Old which are Proposed for Treatment 147
Table 58. Acres and Percent by Forest Type that Meet UEAM Feasibility Criteria in Areas Prescribed for Treatment in Alternative 4 148
Table 59. Vegetation Treatment Summary By Alternative 150
Table 60. Summary of Acreage Proposed for Thinning Where Interfering Plants are Abundant Enough to Restrict other Plant or Seedling Development 155
Table 61. Summary of Types of Sites where UEAM is Prescribed for Each Alternative 157
Table 62. Summary of Vegetative Treatments Proposed in Riparian Zones, Wet Soil (Soil Group III), and Visually Sensitive Areas Within the East Side Project Area 158
Table 63. Acreage Summary for Riparian Zone, Wet Soil (Soils Group III) and Visually Sensitive Areas Occurring Within Sites Proposed for Treatment In the East Side Project Area 159
Table 64. Sites Evaluated for UEAM - Summary of Acreage Distribution Between Areas With and Without Special Sensitivity 159
Table 65. Interfering Plants in Stands Prescribed for UEAM 160
Table 66. Uneven-aged Treatment Summary by Alternative 160
Table 67. Acres of Reforestation Activity in Stands Prescribed for UEAM 163
Table 68. Herbicide Treatment Areas which Potentially Could Exceed 40 Acres 165
Table 69. Reforestation Activity in Stands Prescribed for Salvage Thinning Treatment 168
Table 70. Reforestation Activity in Stands Prescribed for Only Reforestation Treatments (No Harvest Cutting) 168
Table 71. Forest Type Composition – Project Outcome for Each Alternative in 2019 for the Proposed Treatment Areas (8,223 Acres) 172
Table 72. Alternative Treatment Area Age Class Outcomes in Year 2019 174
Table 73. Alternative Treatment Area Stocking Outcomes in Year 2019 175
Table 74. Alternative Treatment Outcomes - Present and Future (in 2019) Stand Stocking with Plants Which interfere with Tree Seedling Development 178
Table 75. Alternative Treatment Area Outcomes - Summary of Woody Vegetation 179
Table 76. Summary of Harvest and Reforestation Activity Proposed for Stands > 111 Years Old 179
Table 77. Ownership and Forest/Non-forest land classification for the East Side Project Area (168,185 acres) 181
Table 78. Vegetation Cumulative Effect Summary 182
Table 79. East Side Project Area Cumulative Totals by Treatment 183
Table 80. Age Class Distribution for ANF Land within the Project Area - Projected to 2019 (as a percent of the 139,990 acres of ANF land) 184
Table 81. Projected Non-forest and 0-20 Year Age Class for Private Land Within the East Side Project Area Based on Twenty Year Projections 184
Table 82. East Side Wildlife Habitats 188
Table 83. Wildlife Habitat Community Types In The East Side Project Area (In Acres) 189

Table 84. Year in Which Breeding Bird Species First Appear, Become Common and Decline in Seedling and Sapling Stands of Northern Hardwoods (Degraaf et al 1992)....208
Table 85. Wildlife Treatments by Alternative (Acres) MA-3.0....213
Table 86. Small Watersheds—Estimated Acres By Present Condition/Alternative....215
Table 87. Summary of Cumulative Effects Related to Oil and Gas Development....225
Table 89. Existing Condition of ROS Classes....237
Table 90. Trails in the Project Area....238
Table 91. Trail Miles Within Harvest Units....241
Table 92. Road Activities on Trails....242
Table 93. Age Classes by Alternative....245
Table 94. Visual Mitigation in Blocks Exceeding 40 Acres....250
Table 95. Live, High-Risk, and Dead Trees in Salvage Areas (4,995 acres) - Average Basal Area by Species....257
Table 96. Current Average Species Composition (Basal Area) of Healthy Hardwood Trees Within the Areas Proposed for Treatment (8,223 acres)....257
Table 97. Summary of Key Economic Values....259
Table 98. Acres Proposed for Treatment within the Ridgway Watershed....264

CHAPTER 1 - PURPOSE OF AND NEED FOR ACTION

Project Overview

The East Side project area is located on both the Bradford and Marienville Districts of the Allegheny National Forest (ANF). The East Side project area map (see cover of East Side EIS Map Set) depicts the zone of mortality that is linked to the defoliation and drought events described in the Background section. The zone of mortality encompasses approximately 139,990 acres of federal land and is located primarily on the eastern portion of the ANF. The Proposed Action, distributed to the public in April of 1998, described proposed management activities on over 8,000 acres. Reforestation and understory restoration activities were proposed to restore the forested ecosystem in areas of the East Side project hardest hit by decline and mortality. Other activities include the following: harvesting of forest products, watershed protection, transportation system improvement and development, and wildlife habitat enhancement. Ecosystem restoration and other management activities were proposed to move the East Side project area from the Existing Condition (EC) towards the Desired Future Condition (DFC) as developed from the Allegheny National Forest Land and Resource Management Plan, 1986, as amended.

Background

From 1991 through 1996, a series of defoliations caused by elm spanworm and forest tent caterpillar occurred over a wide area of the northern tier of Pennsylvania. During that six-year period, a substantial portion of the East Side project area was repeatedly defoliated. Close to one-half of the area has been defoliated two or more times, and almost one-quarter of it has suffered three or more defoliations. A series of droughts also occurred in 1988, 1991, and 1995. These repetitive stresses weakened the trees and made them more susceptible to attack by secondary pathogens that actually killed the trees. By 1994, Forest Service personnel began to observe sizeable areas of tree mortality and decline. Sugar and red maples, American beech, birch, and white ash were the species that were most affected. The amount of mortality found within individual stands depended upon the concentration of these species (Appendix B pp 3-8).

ANF land managers became concerned about the rapid change in forest conditions observed in certain areas of the ANF. A substantial number of stands that had been moderately or well-stocked with healthy trees subsequently contained numerous dead or declining trees. Furthermore, the ground vegetation components of these ecosystems indicated the forest most likely would not be resilient or self-renewing. Few tree seedlings were present on the forest floor, and abundant vegetation existed which would severely limit additional seedling development. Large, overstory, seed producing trees were much less abundant or less evenly dispersed in these stands than required to produce adequate tree seedlings. Finally, deer were browsing heavily on most of the existing or newly developing seedlings, preventing them from growing tall enough to replace trees that had declined or died. The combination of all of these concerns prompted ANF personnel to consider management actions that would help renew these forest ecosystems and sustain their functional integrity to help promote healthy watersheds on the ANF.

In 1994 and 1995, ANF personnel completed a series of analyses to assess tree mortality/decline, ecosystem sustainability, and to determine vegetative treatments needed to promote healthy forest

ecosystems on selected portions of the ANF. The Mortality I project (Environmental Assessment of Tree Mortality and Ecosystem Sustainability on the Allegheny National Forest, June 1995) focused on areas which, in late 1994, had the most severe tree mortality and decline. It closely examined over 7900 acres and identified ecosystem management actions to treat the most severe mortality on 5,203 acres. These treatments were approved and most have been implemented.

In late 1995, the Mortality II project was initiated as a continuation of these analyses. It addressed ecosystem sustainability, harvesting, and reforestation concerns on additional areas within the zone of mortality. The Decision and Environmental Assessment were litigated. The outcome of the litigation required the Forest Service to prepare an Environmental Impact Statement (EIS). On October 15, 1997, Judge William L. Standish ordered that "On remand, defendants shall reconsider their determination that even-aged management techniques proposed in the Mortality II project for Management Area 3 meet the 'optimality' and 'appropriateness' requirements set forth in 16 U.S.C." The East Side EIS responds to this requirement.

The East Side EIS project analysis also covers four previously identified projects within its boundary that were in various stages of development when the East Side project was initiated. Although the projects were not initiated entirely as a result of mortality and decline, it was a primary factor in their development. As a result, it was decided to combine the Thomas Rock, Coal Mine, Rocket John, and Forest Road 446 projects with the Mortality II project to create the East Side project proposal.

Purpose And Need

Purpose of the Proposal

The fundamental purpose of any Forest Service project is to propose actions which move the area from the existing condition (EC) towards the desired future condition (DFC) as developed from the Allegheny National Forest Land and Resource Management Plan (Forest Plan). This includes implementing the Forest Service natural resource agenda at the local project scale (East Side in this case), striving to maintain and restore healthy and resilient watersheds and ecosystems. Inherent in this process is monitoring land uses, management activities, and naturally occurring ecosystem disturbances, such as those which have occurred in the East Side Project area. Moving towards the DFC for local ecosystems and watersheds can involve changing vegetative composition, age distribution, forest cover type distributions as well as other resource management activities.

In all of the management areas within the East Side project, there is an inherent objective to maintain healthy, resilient, forest ecosystems capable of supplying the vegetation setting necessary to provide the DFC, land uses, watershed functions, and outputs necessary to achieve the purposes of each MA. This includes maintaining healthy well-stocked forest vegetation.

The East Side Project Area contains Management Areas (MAs) 2.0 (1%), 3.0 (83%), 6.1 (8%), and 6.2, 7, and 8 (collectively 8%). There are no vegetative management activities proposed in MAs 6.2 or 7, so there will be no further discussion of those Management Areas. A complete description of the goals and objectives for MA 2.0 are described in the Forest Plan on pages 4-70 through 4-82, for MA 3.0 on pages 4-82 through 4-96, for MA 6.1 on pages 4-110 through 4-124, for MA 6.1 on pages 4-110 through 4-124, and for MA 8.0 on pages 4-169 through 4-179.

It should be noted that the tables that display road activities in various sections of this document include MA 6.2. The Forest Plan allows reconstruction on those roads that serve as boundaries between MA 6.2 and other MAs. Therefore, MA 6.2 is listed in the road activity tables.

There are minor amounts of treatments proposed by the Northeastern Research Station (USDA Forest Service, Irvine, PA) in MA 8.0. See the Descriptions of Alternatives Considered in Detail section of Chapter 2 for an explanation of the proposals.

The following summary comparisons of Existing Conditions and Desired Future Conditions are displayed for some of the environmental components that are closely tied to the Proposed Action.

Management Area 2.0

The primary purpose of MA 2.0 is the following:

1. Provide a continuous, forested scene through the practice of uneven-aged management which would promote tolerant species and produce quality sawtimber,

2. Feature wildlife species associated with shade tolerant vegetation, primarily songbirds and cavity nesting birds and mammals, and

3. Provide the opportunity for a variety of developed and dispersed motorized recreation opportunities in a Roaded Natural setting.

Table 1 describes the Desired Future Condition and the Existing Conditions for 1,638 acres of MA 2.0.

Table 1. Comparison of Desired Future to Existing Conditions MA 2.0

DFC			**Existing Condition**
Permanent openings	**1-3%**		**3%**
Conifer component	**No more than 10% in conifer cover**		**1%**
Uneven-age structure	Provide uneven-aged vegetation structure on 97% of MA 2 (Forest Plan, pp 4-75, 76, and 78)		0%
	Initiate structure development by conducting selection harvest on 6,000 acres (only 1,638 acres are within the East Side Project) (Forest Plan, pp 4-72 and 4-76)		586 acres completed
Stocking levels	Limit land area poorly stocked with trees to acres existing in 1986 (Forest Plan p 4-94 and 4-96) *	+0	+12

*** See silvicultural stocking guidelines (Forest Plan, p 4-14 and Marquis et al 1992 pp 9 and 10)**

Management Area 3.0

The primary purpose of MA 3.0 is to:

1. Provide a sustained yield of high quality Allegheny hardwood and oak sawtimber through even-aged management,

2. Provide a variety of age or size class habitat diversity from seedling to mature sawtimber in a variety of timber types, emphasize deer and turkey in all timber types and squirrel in the oak type, and

3. To provide a roaded natural setting for all types of developed and dispersed recreation opportunities with an emphasis on motorized recreation activities.

The areas managed for these objectives result in a forest of Allegheny or oak hardwood stands with inclusions of conifer, shrub, and herbaceous openings. Table 2 describes the Desired Future Condition and the Existing Conditions for 115,984 acres of MA 3.0.

Table 2. Comparison of Desired Future to Existing Conditions MA 3.0

DFC				**Existing Condition**
Vegetation				
Age-Class Distribution	Even-aged moderate to well stocked stands distributed across a variety of age classes	0-10 (seedling)	9%	6%
		11-20 (sapling	9%	7%
		111+ (old growth)	Min 5%	1%
Stocking levels	Limit land area poorly stocked with trees to acres existing in 1986 (Forest Plan p 4-94 and 4-96) *		+0 acres	+1972 acres
Wildlife				
0-20 year age class	Not greater than 20-25 %			13%
50% or more of the project area in mast-producing timber (>35 years old)				84%
Permanent openings	3-10%			3%
Conifer component	No more than 10% in conifer cover			4%

*** See silvicultural stocking guidelines (Forest Plan, p 4-14 and Marquis et al 1992 pp 9 and 10)**

Management Area 6.1

The primary purpose of MA 6.1 is to:

1. Maintain or enhance scenic quality,
2. Emphasize a variety of dispersed recreation activities in a semi-primitive motorized setting, and
3. Emphasize wildlife species, which require mature or overmature hardwood forests, such as turkey, bear, cavity nesting birds, and mammals.

Table 3 describes the Desired Future Condition and the Existing Conditions for 10,537 acres of MA 6.1.

Table 3. Comparison of Desired Future to Existing Conditions MA 6.1

DFC			Existing Condition
Vegetation			
111+ (old growth)	Min 5%		0
Stocking levels	Limit land area poorly stocked with trees to acres existing in 1986 (Forest Plan p 4-94 and 4-96) *	+0 acres	+70 acres
Wildlife			
Pole timber and saw timber will comprise a minimum of 70% (greater than 20 years old)			94%
Permanent openings	3-10%		2%
Conifer component	No more than 10% in conifer cover		13%

*** See silvicultural stocking guidelines (Forest Plan, p 4-14 and Marquis et al 1992 pp 9 and 10)**

Management Area 8.0 (Kane Experimental Forest)

The primary purpose for Kane Experimental Forest is to provide an area where we will conduct research to improve the benefits of the forest. The Northeastern Research Station at Irvine conducts research projects and training on the Kane Experimental Forest (KEF).

Need for the Proposal

An Interdisciplinary (ID) Team of foresters, wildlife biologists, recreation planners, transportation planners, archaeologists, fisheries biologists, landscape architects, and soil scientists have surveyed and evaluated the East Side planning area to propose management solutions to restore the forested ecosystem in the East Side project area. Such activities would move the project area towards the DFC as described in the Forest Plan. The team identified needs and opportunities that would change or enhance East Side present conditions and would move the area toward the desired future condition.

The following list describes the "needs for action" and opportunities identified for the East Side area that would meet the purpose of implementing the Forest Plan by restoring the forested ecosystem and moving the area towards the DFC.

1. **Initiate reforestation treatments to restore the declining forest ecosystem –**

   As described in the Background Section (p. 1), the vegetation within the East Side project area has undergone considerable change since 1991, primarily due to extensive defoliation, drought, and subsequent decline and/or mortality. As a result, a number of stands are no longer in a healthy, productive, or resilient condition and are not capable of meeting long-term Forest Plan objectives. There is a need to begin a series of reforestation treatments that will restore these stands and their respective watersheds to a healthier condition. In some cases, the stands have deteriorated to the point where they no longer function as forested ecosystems, and reforestation activities are necessary to establish a new stand of trees.

2. **Establish tree seedlings to restore tree regeneration or replacement and to improve the horizontal and vertical diversity in the ecosystem –**

   Horizontal and vertical diversity of the forested ecosystem has been significantly altered at the landscape level as a result of deer population densities in relation to carrying capacity. Under ideal conditions, the forest ecosystem would be composed of the following: a low layer (understory) of native herbaceous plants, shrubs, and tree seedlings; an intermediate layer of shrubs and young trees; and an overstory of dominant and co-dominant trees. Because of browsing by deer, the understory is often composed of ferns, grass, striped maple, and beech brush. The shrub layer, new tree seedlings, and many herbaceous plants are missing in the landscape ecosystem (Forest Plan, Appendix D, pages D-15 and D-16). On some sites, there is a need to restore the understory and to improve the horizontal and vertical diversity in the ecosystem. Tree seedlings can be established and understory conditions restored by one or more of the following actions: initiating reforestation activities (fertilization, herbicide application, fencing) that mitigate the effects of long-standing, high deer populations; mechanical and manual site preparation (to stimulate natural regeneration); and artificial regeneration work (planting seedlings). Once seedlings are established they can be encouraged to grow either by a partial or full removal of the overstory (Forest Plan, appendix D pages D-14 through D-22). In many of these stands there is also an opportunity to salvage dead, dying, or degrading trees (Forest Plan p. 4-48 and 4-49).

3. **Enhance health and vigor of forested stands by regulating stocking and species composition -**

   Areas with stocking levels greater than 80% are producing tree to tree competition for space and nutrients. This creates stress on individual trees. Reduction of stocking levels through harvesting of dead and dying trees, as well as some trees unaffected by mortality and decline, will reduce future stress and possible decline and mortality of residual trees that are needed to maintain continuous forest cover (Marquis et al 1992 p 10; Marquis ed.1994 pp 247-251).

   Within the project area there are also some young stands in need of intermediate treatments to improve stocking and species diversity. This work can be accomplished most efficiently if done concurrently with the needed reforestation treatments in the project area. This will move the area toward the objective of providing a sustained yield of high quality Allegheny Hardwoods through even-age management (Forest Plan, p. 4-82).

4. **Sustainable forest management** –

The primary purpose of MA 3.0 is to provide a sustained yield of high quality hardwood sawtimber and to provide age- and size-class diversity for wildlife habitat (Forest Plan, p. 4-82). It is necessary to start reforestation treatments and regeneration harvests in a portion of mature or declining stands now to promote the sustainable delivery of forest products in MA 3.0. This will create the age-class distribution levels described in the DFC for MA 3.0 and will provide an even flow of forest products over the long-term. Management activities could include regeneration/reforestation treatments such as two-aged harvesting, shelterwood harvest sequences, final harvests, with some implemented through an adaptive management approach. Most of the stands proposed for regeneration contain substantial tree mortality/decline or are at risk of further decline if new stress events occur.

5. **Supply forest products to meet public demand and to contribute to the economic vitality of local communities -**

Congress has directed the Forest Service to provide forest products within the capability of the land and individual Forest Plans (16USC475, 16USC531). The ANF Forest Plan allocates land for the sustainable production of forest products (MA 3.0, Forest Plan, p. 4-82). People's demand for hardwood and other forest products (furniture, paper, fiber and construction materials) continues to be high. This supports the need to supply this renewable resource. There is opportunity in this project to supply large amounts of forest products through salvage (Forest Plan p. 4-48 and 4-49) and green harvests (within the capability of the land) that provide a means to satisfy the public's demand for wood and also contribute to the economic vitality of local communities. Some of the stands within the project area have sustained only partial or moderate tree mortality or decline, while in others the decline/mortality is much more substantial. In both instances the affected trees would lose substantial value as forest products if harvest is not timely.

6. **Transportation system development to provide access and to maintain water quality -**

There is a need to provide an adequate transportation system for both the short- and long-term access for the management of the National Forest lands within the East Side project area. Investments to the existing Forest Service road system are needed to maintain or improve the safety or operating efficiency of roads. Investments in new roads are needed in areas that do not currently have adequate access and there is a need to initiate vegetative treatments.

Poorly maintained roads, improperly located roads, or roads no longer needed can have adverse impacts on watersheds. There is a need to ensure that the transportation system within the project area (new and existing) will not degrade water quality. Opportunities exist to maintain and enhance water quality. This could be accomplished by eliminating unnecessary roads and by surfacing roads within 300 feet of streams with limestone to reduce the possibility of sedimentation.

7. **Restore wildlife habitat -**

Many of the stands in the East side project area have declined to such an extent that they have less than half of the normal levels of tree stocking. In some areas there is a lack of canopy closure, and true forested habitat is no longer provided. The natural replacement of this forest cover is inhibited by long standing, high deer populations. Restoring forest ecosystems is also an opportunity to enhance wildlife habitat through vegetative management techniques and to develop habitat structure.

Habitat improvement in declining areas will include site preparation and planting of species that benefit wildlife and will occur concurrently with habitat improvement activities in areas unaffected by mortality and decline. There are also opportunities to improve wildlife habitat through additional activities such as: construction of water holes, catch basins and fish structures, seeding and planting, aspen regeneration, and conifer release.

Public Involvement and Issue Development

Scoping

The Interdisciplinary Team conducted an analysis in this project area for the purpose of implementing the Forest Plan. During this analysis process, resource specialists from several disciplines inventoried and analyzed information concerning the proposed project area. Opportunities were identified as a result of this analysis process that would help move from the Existing Condition toward the Desired Future Condition. Issues that arose during the process became part of the Purpose and Need and were incorporated into the Proposed Action. On April 23, 1998 a scoping letter was sent to all those people and organizations that had requested information concerning proposed management activities. A Notice of Intent (NOI) to prepare an environmental impact statement was published in the Federal Register at the same time. The scoping letter presented the Purpose and Need, Proposed Action and invited comments from members of the public to help identify issues that they might have concerning the Proposed Action. See Appendix A for a detailed discussion of the scoping process.

Issues Used to Formulate Alternatives

The purpose of soliciting comments during the scoping period is to determine whether there are any unresolved issues that affect a proposed action. Many issues and concerns originating from public comments and agency concerns were identified for analysis. For a more detailed discussion of the disposition of comments received during the scoping period, please see Appendix A. The comments that were received during scoping were evaluated using the following criteria:

1. Were they issues that should be addressed at a higher level?

2. Have they already been addressed at a higher level?

3. Can they be resolved by applying Forest Plan Standards and Guidelines?

4. Could they be resolved by modifying the Proposed Action?

Issues that remain after applying the above criteria are considered "unresolved" and are used to formulate alternatives to the Proposed Action. They will also be used in the analysis of the alternatives. The following issues were identified through the scoping process.

Issue: What level of timber harvest should occur in the East Side Project Area?

There is a concern over the amount of timber harvesting, if any, that should occur in conjunction with other management activities. Numerous comments were received both in favor of and in opposition to the commercial harvesting of trees within the project area. Comments proposed varying levels of management that ranged from no harvest at all to expanding the amount of harvesting in the Proposed

Action to include more areas. This issue can be addressed by developing alternatives that propose different levels of timber harvest.

Measures used to evaluate alternatives include the following:

- Total acres of timber harvesting;
- Transportation system activities necessary to complete harvesting activities,
- Long-term sustainability of the forest resource; and
- Volume and value of timber harvested.

Issue: Should only dead, dying, and damaged trees be salvage harvested?

There are concerns about the appropriate amounts of timber harvesting in response to tree mortality and decline. Treatments could be limited to the removal of only dead, dying, and damaged trees.

Measures used to evaluate alternatives include the following:

- Percent of potential dead and dying material salvaged and utilized

Issue: Should herbicides and other reforestation treatments be used to help sustain forest cover in declining forest ecosystems?

There is a concern over the use of herbicides and the amount of other reforestation treatments in the project area. Stand regeneration prescriptions in the Proposed Action include the application of herbicides to remove vegetation that inhibits the establishment and growth of desired tree seedlings. There were comments received in favor of and in opposition to the use of herbicides. This issue can be addressed by developing alternatives to the Proposed Action that do or do not propose the use of herbicides or other reforestation treatments.

Measures used to evaluate alternatives include the following:

- Reforestation activity acres,
- Potential vegetation response to treatment versus the response to doing no treatment, and
- Potential risks to human health and wildlife from using herbicides.

Issue: What level of construction of new roads and reconstruction of existing roads should be implemented in the project area?

Comments were received that urged that no new roads be constructed in the project area. Other commentors were concerned about the amount of reconstruction of roads called for in the Proposed

Action. Other comments agreed with the amount of road activity in the Proposed Action. This issue can be addressed by developing alternatives to the Proposed Action that propose varying quantities of road construction and reconstruction.

Measures used to evaluate alternatives include the following:

- Road density;
- Existing road corridor added to the FS system;
- Miles of construction, reconstruction, decommissioning; and
- Number of stone pits.

Issue: Should even-aged management or uneven-aged management silvicultural systems be used in the project area?

The Forest Plan gives direction regarding the primary silvicultural system to be used in each Management Area. Forest Plan direction is based on considerable analysis of trade-offs between these systems (Appendix F of East Side EIS). In MA 2.0, uneven-aged management will be the featured silvicultural system (Forest Plan, p. 4-70). MA 3.0 features even-aged management with uneven-aged management being an option for inclusions such as riparian areas, wet soils, or visually sensitive areas (Forest Plan, p. 4-82). In MA 6.1, even-aged and uneven-aged silvicultural systems will be used to achieve the wildlife and recreation management objectives (Forest Plan, p.4-116). In MA 8.0, the silvicultural systems and associated activities will be specified in each research project (Forest Plan, pp 4-177).

As a result of the litigation discussed in the Background section, the Order, signed by United States District Judge William L. Standish on October 15, 1997, contains the following direction: "On remand, defendants shall reconsider their determination that the even-aged management techniques proposed in the Mortality II Project for Management Area 3 meet the ‘optimality’ and ‘appropriateness’ requirements set forth in 16 U.S.C."

Comments were received that urged more and, in some cases, exclusive use of uneven-aged management techniques in the project area. Other comments agreed with the use of even-aged management as called for in the majority of the stands scheduled for treatment in the Proposed Action.

There is a concern that uneven-aged management techniques will not result in a sustainable forest condition in MA 3.0 stands that are currently being managed in an even-aged manner.

This issue can be addressed by developing alternatives that propose both even-aged and uneven-aged management practices.

Measures used to evaluate alternatives include the following:

- Number of acres proposed for even-aged and uneven-aged management;
- Net Cash flow;
- Acres where regeneration success is anticipated based on historical ANF tree seedling development patterns;
- Acres of future moderately to well-stocked forest cover, and

- Future stand value.

Relationship To Other Documents

This analysis is tiered to the following documents:

- The Allegheny National Forest Land and Resource Management Plan, as amended, 1986 and Final Environmental Impact Statement

- The Understory Vegetative Management Final Environmental Impact Statement and Record of Decision (3/91)

- Vegetation Management on Electric Utility Rights-of-Way Final Environmental Impact Statement and Record of Decision (Allegheny National Forest, 1996)

The following documents are incorporated by reference:

- The Allegheny National Forest Monitoring and Evaluation Reports from FY 1987 to FY 1998 – These reports evaluate the monitoring and evaluation of Forest Plan implementation to determine how well standards and guidelines have been applied.

- Environmental Assessment of Tree Mortality and Ecosystem Sustainability on the Allegheny National Forest (6/95), also referred to as Mortality I – Approved 5,203 acres of treatment to restore the ecosystem on the most severe mortality on over 7,000 acres within the zone of mortality.

- The following Environmental Assessments are documents that have approved past, present, or future activities within the zone of mortality:

Hoffman Farm 1/30/95	Lame Skunk 6/21/91	Turnup Run 4/2/96
Eagle Mills 5/22/96	Mother Nature 3/12/93	Wintergreen 12/4/95
Wolf Run Salvage 5/9/95	Deer Fence 6/12/92	Duck Ponds 9/18/91
Songbird 9/30/91	Beaver Dam 6/20/91	Swede Hill 8/13/90
Carlo 1/8/91	Greely Farm 8/19/94	Gumdrop 11/12/92
Derringer 9/30/91	FR165 3/17/93	Dalmation 2/20/91
Three Mile 6/24/91	Gladwater 7/1/93	
Porter's Prize 5/19/95	Coon Creek 3/9/94	

- The East Side Project File – Contains analyses and documentation used in the East Side project.

Cooperating Agencies

U.S. Department of Interior, Fish and Wildlife Service

The Forest Service works in close cooperation with the US Department of the Interior Fish and Wildlife Service (USDI FWS). In December 1998, the ANF entered into formal consultation with the USDI FWS with regard to the potential effects of the implementation of activities as outlined in Forest Plan on five federally threatened and endangered species. Formal consultation was concluded on June 1, 1999, when the USDI FWS issued their Biological Opinion (BO). All management activities proposed within the East Side Project are subject to the terms and conditions of the BO. The Forest Plan was amended on July 28, 2000 to incorporate the terms and conditions of the BO.

U.S. Department of Interior, National Park Service

The North Country Trail (NCT) is a National Scenic Trail. The National Park Service coordinates the management of the trail. In cooperation with public and private interests, the National Park Service completed a Comprehensive Plan for Management and Use of the NCT in September 1982. The National Park Service is responsible at the federal level for carrying out the provisions of the National Trails System Act (10/2/68) as they relate to the NCT by coordinating, guiding, and assisting the efforts of others to acquire, develop, operate, protect and maintain the Trail in accordance with the comprehensive plan. Because significant portions of the Trail traverse lands under the separate jurisdictions of the National Park Service, Forest Service, and North Country Trail Association, these three parties have entered into a Memorandum of Understanding for administering, operating, and maintaining the NCT. The Forest Plan incorporated management strategies for the NCT from this Comprehensive Plan. The Forest Service advises the National Park Service and North Country Trail Association when they are planning any management involving the NCT.

On August 16, 2000, Bill Menke (NPS manager for the NCT) reviewed portions of the East Side project area.

Decision To Be Made

This Environmental Impact Statement will evaluate site-specific management proposals, consider alternatives, and analyze the effects of the activities proposed in these alternatives. It will form the basis for the deciding officer, the Forest Supervisor of the Allegheny National Forest to determine:

1. Whether or not the proposed activities and alternatives are responsive to the issues, are consistent with Forest Plan direction, meet the purpose and need as described for the East Side Project and are consistent with other related laws and regulations directing National Forest management activities.

2. Which actions, if any, to approve.

3. Whether or not the information in this analysis is sufficient to implement proposed activities.

CHAPTER 2 - ALTERNATIVES

The Interdisciplinary Team looked at a wide range of management options (alternatives) for areas within the zone of mortality and developed alternatives based upon the unresolved issues that arose during scoping. This section documents the results of the analysis completed for five alternatives considered in detail. Alternatives that were evaluated and eliminated from detailed study are also discussed in this chapter.

Formulation of Alternatives

Public comments on the Proposed Action were received in May of 1998. After agency and public comments were analyzed, alternatives were developed by the ID Team to respond to the unresolved issues described in Chapter I. Alternatives were developed through consideration of management needs and opportunities as determined by on-the-ground investigations, agency concerns, and public input received through the scoping process. The alternatives, both those considered in detail and those eliminated from further study, display a range of options that: could be implemented to manage the East Side planning area, represent different levels of management, and provide a framework to analyze the unresolved issues. Alternatives eliminated from detailed study, including some detailed alternatives submitted by the public, are included in this chapter.

The development of alternatives was guided by Forest Plan Standards and Guidelines (Forest Plan, pp. 4-8 through 4-53) and the management area direction for MA 2.0, MA 3.0 and MA 6.1. Site-specific mitigation measures developed for each alternative are listed in Appendix D.

In determining what activities should occur on the analyzed areas, the ID team first examined site-specific and local watershed considerations, such as soils, severity of mortality, understory composition, wildlife habitat, etc. Next, the team looked at landscape considerations: the spatial pattern of existing and proposed harvested units, the age-class distribution, and patch size.

The majority of the stands within the East Side project area were not proposed for treatment. Even in the most aggressive alternative considered in detail, only 6 percent of the project area will be affected. The amount of the project area left untreated by proposals in the East Side project varies, based on the intent of each alternative, from a low of 94 percent in Alternative 1 to a high of 100 percent in Alternative 5 (no action). The following criteria were used to help identify potential stands to treat:

- The stand meets the initial prescription criteria for a treatment, and
- It is economically feasible to salvage the dead and dying trees, and
- It is environmentally feasible to salvage, and
- Other resource concerns do not preclude management, including the salvaging dead and dying trees, or
- The stand is within the Thomas Rock, Coal Mine, Rocket John, or Forest Road 446 projects.

Treatments within these latter four projects were included in the East Side Project because some of them were designed to deal with tree mortality and decline, and the projects were within the East Side project area. Other treatments not associated with tree mortality and decline were included in East Side in order to maintain the initial integrity of the projects from which they originated.

The tables displaying the lists of proposed activities in each alternative contain various types of silvicultural treatments, wildlife treatments and road system activities. Detailed descriptions of these activities can be found in Appendix B, the Vegetation Report; Appendix C, the Biological Assessment; Chapter 3 of this EIS; or various professional texts and handbooks. For ease in interpreting these tables, the following brief descriptions are provided:

Vegetation

Green versus Salvage

Green - The term 'green' is used in reference to the following conditions:

- Thinning prescriptions - more than 50% of the volume to be harvested is made up of healthy trees.
- Regeneration harvests - (both even-aged and uneven-aged), healthy relative stand density is greater than 40% prior to treatment.

Salvage – The term 'salvage' is used in reference to the following conditions:

- Thinning prescriptions - more than 50% of the volume to be harvested is made up of dead, dying or damaged trees.
- Regeneration harvests (both even-aged and uneven-aged) - healthy relative stand density is less than 40% prior to treatment.

Regeneration Harvests

Even-aged Regeneration Harvests

Even-aged regeneration harvest prescriptions include treatments that occur in stands that are severely impacted by tree mortality and decline, as well as healthier stands. Reforestation treatments such as herbicide application, site preparation for natural regeneration, fertilization, area fencing, and individual tree fencing and planting are prescribed based upon site specific needs within a stand. The combination of timber harvest and reforestation activity results in the restoration and maintenance of forested stands, the establishment of vertical and horizontal vegetative diversity, the production of wood products, and the establishment of age class diversity across the landscape. Even-aged regeneration harvests are proposed only in MA 3.0 and MA 6.1.

Clearcut – Clearcutting is a regeneration method used to establish even-aged stands whereby all trees, except residuals designated according to mitigation measures, are removed in one harvest.

Shelterwood seed cut sequence – This is a two-cut sequence that is designed to create a single age class. The first cut establishes natural regeneration (1st entry), and the second cut creates conditions which promote seedling survival and growth (2nd entry). The purpose of the seedcut is to leave large, seed-bearing trees and to remove enough trees to provide at least 50 percent sunlight on the ground for seedling development. Typically seedlings become established in 3-10 years, at which time the remainder of the overstory is removed (except for residual and wildlife trees). The overstory removal creates full sunlight conditions on the ground which enables newly established seedlings to survive and grow freely.

Shelterwood removal cut (delay) – In stands that have already received a shelterwood seed cut, the removal cut is delayed until seedlings are present. Once seedlings are established in three to ten years, the remaining overstory will be removed.

Prep cut / Two-aged – A two-aged harvest sequence can be initiated by applying a standard shelterwood cut (implemented through adaptive management) with supporting mechanical or chemical site preparation.

Two-Aged - A two aged-harvest is a modified even-aged harvest treatment (implemented through adaptive management) that can provide a compromise between even-aged and uneven-aged management in stands dominated by both overstory and seedling species that are moderately shade tolerant. The concept is to maintain two age classes on a particular site with the two age classes being separated by a half rotation.

Uneven-aged Harvests

Uneven-aged harvest prescriptions include treatments (implemented through adaptive management) that occur in stands that are severely impacted by tree mortality and decline, as well as in healthier stands. Reforestation treatments such as herbicide application, site preparation for natural regeneration, area fencing, and individual tree fencing and planting are prescribed based upon site-specific needs within a stand. The combination of timber harvest and reforestation activity should result in the restoration and maintenance of forested stands, the establishment of vertical and horizontal vegetative diversity, the production of forest products, and the establishment of age-class diversity within individual stands. However, on the ANF reforestation success achieved through uneven-aged management has been marginal (see Chapter 3, Vegetation Section-Potential for Uneven-aged Management). Uneven-aged regeneration harvests are proposed as an adaptive management technique in MAs 2.0 and 3.0. According to the Forest Plan, in MA 2.0 uneven-aged management is the featured silvicultural system, and in MA 3.0 it may be considered on riparian areas, visually sensitive areas, and on wet soils. In this project, it is also considered for use on sites proposed for even-aged management that have the biological characteristics that could potentially sustain its use.

Selection - This is a regeneration cut in which an uneven-aged structure is created and maintained by removing single trees from all size classes. With single-tree selection, individual trees of all size classes are removed more-or-less uniformly throughout the stand to achieve a range of diameter classes within the residual stand. Stands will be monitored for several years to insure adequate seedling development has occurred. Reforestation practices may include site preparation, herbicide application, fertilization, and fencing.

Group Selection - This is a regeneration cut in which an uneven-aged structure is created and maintained by removing small groups of trees from all size classes. With group selection, small groups of trees are removed to provide full sunlight conditions on the ground which enables the establishment, development and, growth of seedlings. The width of groups is approximately twice the height of the mature trees in the stand and generally less than .5 acre (Forest Plan, Chapter 4 p 76). Stands will be monitored for several years to insure adequate seedling development has occurred. Reforestation practices may include site preparation, herbicide application, fertilization, and fencing.

Transition cut – Transition cuts are treatments where one of the objectives is to initiate an uneven-aged structure in an even-aged stand – transitioning from an even-aged structure to an uneven-aged structure.

Intermediate Harvests

Even-aged Thinning Harvests

Even-aged thinning prescriptions include treatments that occur in stands that are lightly to moderately impacted by tree mortality and decline, as well as healthier stands where stocking levels are high. These timber harvest activities are designed to maintain the health and vigor of stands and to provide wood products to meet social demand. The objective of treatments will be to establish even-aged structure in these stands and to produce wood products. Even-aged thinning harvests are proposed only in MA 3.0.

Commercial Thinning (green) – This is an intermediate cut designed to enhance the growth and quality of crop trees and to remove declining live trees where more than 50% of the volume to be harvested is made up of healthy trees.

Commercial Thinning (salvage) - This is an intermediate cut designed to enhance the growth and quality of crop trees and to remove dead/declining trees where more than 50% of the volume to be harvested is made of dead, dying or damaged trees.

Modified Salvage Thinning - Modified salvage thinning, proposed in Alternatives 2 and 4, is designed to harvest, where economically feasible, only trees that are already dead or trees that are expected to die within the next 5-10 years. Modified salvage thinning will occur in stands that currently have an even-aged structure, and treatments are not designed to alter existing stand structure beyond that which will occur as a result of natural mortality.

Reforestation Only

Reforestation treatments with no associated timber harvest occur in stands that are severely impacted by tree mortality and decline and where no opportunity for commercial timber harvest activity exists. Reforestation treatments such as herbicide application, site preparation for natural regeneration, fertilization, area fencing and individual tree fencing, and planting are prescribed based upon site specific needs within a stand. The application of reforestation treatments in stands that have been severely impacted by mortality results in the restoration of forested stands, the establishment of vertical and horizontal vegetative diversity, and the establishment of age class diversity across the landscape. "Reforestation only" treatments occur in MA 3.0 and MA 6.1.

Reforestation Treatments

Reforestation treatments are proposed in many of the stands with timber harvest treatments.

Herbicide application – The ground application of sulfometuron methyl or glyphosate (or a combination of the two) is proposed on sites where a dense cover of fern, grasses, beech root suckers, and/or striped maple are found. This treatment will occur on sites where new seedlings are to be established in order to perpetuate well stocked forest cover.

Site preparation –

- Striped Maple Cutting – This involves the cutting of mid-story striped maple, beech, or other selected woody species in order to reduce shading and to promote the development of desired species.

- Site Preparation For Natural Regeneration – This involves the cutting of saplings and small pole-sized stems following the shelterwood removal cut or clearcut where these stems interfere with the development and growth of seedlings.

Fertilization – The application of fertilizer stimulates or maintains vigorous seedling height growth, permitting seedlings to quickly grow beyond a height at which deer are able to browse them.

Individual Tree or Area Fencing – Fences provide protection for seedlings from browsing by deer. Individual tree fences stimulate tree growth by creating "miniature greenhouse" conditions.

Planting of Tree and Shrub Species – This includes the planting of native species such as shrubs, hardwood trees, hemlock, and red and white pine.

TSI/Release – This involves the non-commercial cutting of tall-growing, woody vegetation (generally seedling or sapling size) that interferes with the tree seedlings, saplings, or shrubs that are desired on a site.

Transportation

New Road Construction -- Investment in construction of a road that results in a new road corridor.

Road Reconstruction -- The investment in construction activity that results in betterment, restoration, or in the realignment of a road as defined below:

> **Realignment --** Investment in construction activity that results in the new location of an existing road or portions thereof (FSM 7705).
>
> **Betterment --** Investment in construction activity that raises the traffic service level of a road or improves its safety or operating efficiency (FSM 7705).
>
> **Restoration --** Investment in construction activity required to rebuild a road to its approved traffic service level (FSM 7705).

Long Skid – When the travelway used to drag or transport trees from the stump to the road is greater than ½ mile. Typically, this will require a constructed skid trail with some earth moving activities and restoration.

Temporary Road - A temporary road is one that is constructed only to a standard high enough to protect the resources during its use and is then returned to a vegetated condition.

Road Decommissioning – Activities that terminate the function of a road.

Wildlife Treatments

These are proposals designed to maintain or enhance wildlife habitat. They include the following activities: wildlife and fish habitat improvement, fruit tree pruning and release, grass/forb seeding, and non-forest shrub and conifer planting and fencing.

Descriptions of Alternatives Considered in Detail

Kane Experimental Forest Proposals

The staff at the Forestry Sciences Laboratory of the Northeastern Forest Experiment Station at Irvine conducts research projects on the Kane Experimental Forest (KEF). They also use their research plots for natural resource training. The KEF falls within the East Side project boundary and has experienced some of the same insect, disease, decline, and mortality problems as the rest of the project area (zone of mortality). The decline and mortality in several of the training plots have changed individual stand conditions to the point where the plots can no longer be used for their original, intended purpose. The staff at Irvine is proposing to use these stands for research purposes and as demonstration areas for treatment responses to mortality and decline.

The KEF is MA 8.0 (see Chapter 1). The primary objective of the KEF is to provide an area where research projects will generally relate to forest management problems and opportunities in the northeast. The Forestry Sciences Lab is, therefore, proposing the treatments listed in Table 4 (also see Appendix E) for training and research purposes. These treatments are proposed for all action alternatives.

Table 4. Kane Experimental Forest Treatments

Treatment	Acres
Shelterwood, low shade removal	3
Shelterwood, low shade removal (herbicide)	3
Shelterwood, (inadequate regeneration)	3
Shelterwood, (adequate regeneration)	3
Delayed Shelterwood, low shade removal	3
Clear-cut	3

Alternative 1 (Proposed Action)

Alternative 1 proposes reforestation and timber harvest activities that will promote forest ecosystem restoration in response to changes in vegetation that have occurred as a result of light to severe mortality and decline. This alternative initiates salvage regeneration harvest and reforestation prescriptions in areas of severe mortality. It proposes salvage thinnings in areas of light to moderate mortality. It also proposes only reforestation activity in stands that are severely impacted by mortality but no longer have commercially viable harvest options. Vegetation is managed primarily by using even-aged systems in MA 3.0 and 6.1, and uneven-aged systems in MA 2.0, per Forest Plan direction. Alternative 1 also proposes vegetative management prescriptions and wildlife habitat enhancement activities that meet Forest Plan objectives for MA 2.0 and 3.0 in stands that are not impacted by mortality.

Alternative 1 proposes transportation system management that provides access to support timber harvest, reforestation and wildlife habitat activities.

Proposed Activities

The types and quantities of activities proposed in Alternative 1 (proposed action) are summarized in Tables 5-7. Alternative 1 maps (see East Side EIS Map Set document) display the distribution of the proposed treatments within the 139,990-acre zone of mortality. See Appendices B and C for a detailed list of the treatments proposed for each stand.

Vegetative Treatments

Table 5 displays the total vegetative treatments proposed for Alternative 1.

Table 5. Alternative 1: Total Vegetation Treatments (acres)

Activity	MA 3.0	MA 2.0	MA 6.1	Total	Herbicide	Site Prep	Fertilize	Fence	Plant	TSI/ Release
EVEN-AGED REGENERATION HARVESTS										
Green										
Clearcut (includes 18 ac. wildlife openings)	112	0	0	**112**	21	0	13	40	21	16
Shelterwood seed cut (1st entry)/ Removal cut (2nd entry)	589	0	0	**589**	610	547	311	236	66	34
Shelterwood removal cut	29	0	0	**29**	9	3	44	25	9	44
Shelterwood removal cut (delay)	88	0	0	**88**	87	82	28	74	24	0
Prep cut / Two-aged	142	0	0	**142**	125	139	0	138	24	0
Reforestation treatments only	76	0	0	**76**	43	21	29	6	18	35
Salvage										
Clear-cut	84	0	0	**84**	78	85	85	39	39	0
Shelterwood seed cut (1st entry)/ Removal cut (2nd entry)	1284	0	0	**1284**	1227	979	535	896	283	21
Shelterwood removal cut	58	0	0	**58**	6	25	43	5	5	0
Shelterwood removal cut (delayed)	592	0	0	**592**	574	473	191	452	109	82
Prep cut /Two-aged	71	0	0	**71**	71	71	0	39	14	0
Two-aged	132	0	0	**132**	132	119	0	79	36	0
Reforestation treatments only	28	60	90	**178**	169	150	0	90	11	0
INTERMEDIATE TREATMENTS										
Green										
Commercial Thinning	1778	0	0	**1778**	0	0	0	0	0	0
Salvage										
Salvage Thinning	2479	0	0	**2479**	5	1	14	3	3	0
UNEVEN-AGED										
Green										
Selection	55	63	0	**118**	43	68	0	43	43	63
Group Selection	0	154	0	**154**	127	154	0	25	0	154
Transition Cut	18	0	0	**18**	0	0	0	0	0	0
Salvage										
Selection	28	12	0	**40**	12	12	0	12	12	12
Group Selection	0	115	0	**115**	80	115	0	80	80	115
Total	**7643**	**404**	**90**	**8137**	**3419**	**3044**	**1293**	**2282**	**797**	**576**

Transportation Activities

Transportation management activities include road construction, road reconstruction (including betterment, re-alignment and restoration), decommissioning of existing roads, expansion of existing stone pits, and the development of new pits. Road construction and reconstruction proposals occur on segments of roads that are needed to support vegetative management activities. No long skids are proposed. These activities provide transportation systems that are adequate to support the management activities on National Forest lands.

Table 6. Alternative 1: Proposed Transportation System Activities (miles, # of pits)

Road System Activities (Miles)	Private	MA 2.0	MA 3.0	MA 6.1	MA 6.2	Total
New construction	**0.2**	**0.1**	**14.9**	**0.0**	**0.0**	**15.2**
Road reconstruction						
Existing road betterment	1.2	0.3	14.5	0.0	0.0	16.0
Existing road realignment	0.3	0.0	1.2	0.0	0.0	1.5
Existing road restoration	6.8	6.1	76.5	0.2	2.4	92.0
Total Road Reconstruction	**8.3**	**6.4**	**92.2**	**0.2**	**2.4**	**109.5**
Existing road decommissioning	**0.0**	**0.0**	**7.2**	**0.0**	**0.0**	**7.2**
Temporary road/long skid	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Stone pits (# of pits)	**0**	**3**	**40**	**0**	**0**	**43**
Existing pit expansion	0	1	32	0	0	33
New pit development	0	2	8	0	0	10

Wildlife Treatments

Wildlife habitat improvement activities are proposed to increase species diversity in the project area by planting shrub and tree species that are absent or found in small amounts, to establish habitat components such as permanent openings, to promote the growth of existing trees and shrubs beneficial to wildlife. Wildlife treatments are proposed in MA 2.0, MA 3.0, and MA 6.1.

Table 7. Alternative 1: Wildlife Treatments (acres)

Wildlife Treatments	MA	Acres
Create/Maintain openings	3.0	2
Clearcut for opening	3.0	9
Regenerate aspen	3.0	92
Seeding	3.0	54
Planting	3.0	466
Planting	2.0	187
Planting	6.1	15
Fencing	3.0	43
Prune and release apple trees (108)	3.0	36
Release mast producing shrubs/trees	3.0	14
Conifer release	3.0	36
Nest Boxes	3.0	14
Catch basins and fish structures	3.0	9
Construct water holes	3.0	7

Timber Outputs

Alternative 1 will generate a harvest volume of approximately 34 MMBF of timber in the first entry and 30 MMBF in three to ten years from the final harvest of shelterwood seed treatments.

Alternative 2

Alternative 2 was developed in response to the issue, "Should only dead, dying, and damaged trees be salvage harvested?" In addition, no reforestation treatments are proposed. The goal of this alternative is to utilize wood fiber and sawtimber whose economic value would be lost if not harvested within the next 5-10 years. Alternative 2 proposes to remove (salvage) the dead and dying trees where salvage harvesting is economically feasible. Harvesting only dead and dying trees is not intended to achieve either an even-aged or uneven-aged structure.

Proposed Activities

The types and quantities of activities proposed in Alternative 2 are summarized in Tables 8-9. Alternative 2 maps display the distribution of the proposed treatments within the 139,990-acre zone of mortality. See Appendices B and C for a detailed list of the treatments proposed for each stand.

Vegetative Treatments

Table 8. Alternative 2: Modified Salvage Thinning (acres)

Activity	MA 3.0	MA 2.0	MA 6.1	Total	Herbicide	Site Prep	Fertilize	Fence	Plant	TSI/ Release
INTERMEDIATE TREATMENTS										
Salvage										
Modified Salvage Thinning	4049	115	0	**4164**	0	0	0	0	0	0
Total	**4049**	**115**	**0**	**4164**	**0**	**0**	**0**	**0**	**0**	**0**

Transportation Activities

Table 9. Alternative 2: Proposed Transportation System Activities (miles, # of pits)

ROAD SYSTEM ACTIVITIES (Miles)	Private	MA 2.0	MA 3.0	MA 6.1	MA 6.2	Total
New construction	**0.1**	**0.1**	**8.1**	**0.0**	**0.0**	**8.3**
Road reconstruction						
Existing road betterment	0.6	0.3	8.5	0.0	0.0	9.4
Existing road realignment	0.0	0.0	0.9	0.0	0.0	0.9
Existing road restoration	6.4	4.2	67.6	0.0	2.4	80.6
Total Road Reconstruction	**7.0**	**4.5**	**77.0**	**0.0**	**2.4**	**90.9**
Existing road decommissioning	**0.0**	**0.0**	**5.2**	**0.0**	**0.0**	**5.2**
Temporary road/long skid	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Stone pits (# of pits)	**0**	**3**	**33**	**0**	**0**	**36**
Existing pit expansion	0	1	27	0	0	28
New pit development	0	2	6	0	0	8

Timber Outputs

Alternative 2 will generate a harvest volume of approximately 6 MMBF of timber in one entry. There is no second entry prescribed in Alternative 2.

Alternative 3

Alternative 3 was developed primarily in response to the issue, "What level of construction of new roads and reconstruction of existing roads should be implemented in the project area?" Otherwise it responds to the same issues as Alternative 1. Alternative 3 includes all of the treatment activities in the proposed action (Alternative 1) that could be feasibly accomplished without the construction of additional roads or major reconstruction of existing roads. Road maintenance and restoration activities are proposed in Alternative 3. Harvest activities included in this alternative are those designed to treat tree mortality and decline conditions as well as activities designed to achieve multiple-use objectives under healthy stand conditions. Feasibility varies with the commercial value of the harvest material, site conditions, and distance from the existing transportation facility.

Alternative 3 is similar to Alternative 1 in that it proposes the following:

1. Proposes to restore forested ecosystems by addressing changes in vegetation that have occurred as a result of light to severe mortality;
2. Initiates regeneration harvesting in stands with severe mortality;
3. Proposes salvage harvesting in stands with light to moderate mortality;
4. Implements vegetative management prescriptions (timber harvest) in stands that are not impacted by tree mortality and decline;
5. Accomplishes wildlife habitat enhancement activities that meet Forest Plan objectives; and
6. Initiates reforestation treatments in stands suffering from severe tree decline/mortality.

Alternative 3 differs from Alternative 1 by eliminating all activities that cannot be completed without road construction or major reconstruction. In low stocked areas where regeneration harvest has been dropped, reforestation activities would still be completed through adaptive management and would be monitored to determine the impact of the residual large trees on successful seedling development and growth.

Proposed Activities

The types and quantities of activities proposed in Alternative 3 are summarized in Tables 10-12. Alternative 3 maps display the distribution of the proposed treatments within the 139,990-acre zone of mortality. See Appendices B and C for a detailed list of the treatments proposed for each stand.

Vegetative Treatments

Table 10 displays the total vegetative activities proposed for Alternative 3.

Table 10. Alternative 3: Total Vegetative Treatments (acres)

Activity	MA 3.0	MA 2.0	MA 6.1	Total	Herbicide	Site Prep	Fertilize	Fence	Plant	TSI/ Release
EVEN-AGED REGENERATION HARVESTS										
Green										
Clear cut (includes 3 ac wildlife openings)	40	0	0	**40**	14	0	0	6	0	0
Shelterwood seed cut (1st entry)/Removal cut (2nd entry)	252	0	0	**252**	272	229	122	67	32	34
Shelterwood removal cut	29	0	0	**29**	9	3	44	25	9	44
Shelterwood removal cut (delay)	72	0	0	**72**	53	48	28	51	15	0
Prep cut/Two-aged	71	0	0	**71**	70	67	0	67	13	0
Reforestation treatments only	76	0	0	**76**	43	21	29	6	18	35
Salvage										
Clear-cut	84	0	0	**84**	78	84	84	39	39	0
Shelterwood seed cut (1st entry)/Removal cut (2nd entry)	1156	0	0	**1156**	1101	839	423	788	256	21
Shelterwood removal cut	58	0	0	**58**	6	25	41	5	5	0
Shelterwood removal cut (delayed)	470	0	0	**470**	469	370	179	367	97	82
Prep cut / Two-aged	32	0	0	**32**	32	32	0	0	0	0
Two- aged	130	0	0	**130**	129	117	0	78	35	0
Reforestation treatments only	270	60	90	**420**	411	390	124	298	57	0
INTERMEDIATE TREATMENTS										
Green										
Commercial Thinning	535	0	0	**535**	0	0	0	0	0	0
Salvage										
Salvage Thinning	1904	0	0	**1904**	5	1	0	5	5	0
UNEVEN-AGED										
Green										
Selection	14	63	0	**77**	43	68	0	43	43	63
Group Selection	0	154	0	**154**	127	154	0	25	0	154
Transition Cut	18	0	0	**18**	0	0	0	0	0	0
Salvage										
Selection	0	12	0	**12**	12	12	0	12	12	12
Group Selection	0	115	0	**115**	80	115	0	80	80	115
Total	**5211**	**404**	**90**	**5705**	**2954**	**2575**	**1074**	**1962**	**716**	**560**

Transportation Activities

Table 11. Alternative 3: Proposed Transportation System Activities (miles, # of pits)

Road System Activities (Miles)	Private	MA 2.0	MA 3.0	MA 6.1	MA 6.2	Total
Existing road restoration	**6.8**	**4.0**	**73.3**	**0.2**	**2.4**	**86.7**
Existing road decommissioning	**0.0**	**0.0**	**2.0**	**0.0**	**0.0**	**2.0**
Temporary road/long skid	**0.0**	**0.0**	**3.5**	**0.0**	**0.0**	**3.5**
Stone pits (# of pits)	**0**	**1**	**32**	**0**	**0**	**33**
Existing pit expansion	0	1	25	0	0	26
New pit development	0	0	7	0	0	7

Wildlife Treatments

Table 12. Alternative 3: Wildlife Treatments

Wildlife Treatments	MA	Acres
Create/Maintain 0penings	3.0	2
Regenerate Aspen	3.0	92
Seeding	3.0	54
Planting	3.0	466
Planting	2.0	187
Planting	6.1	15
Fencing	3.0	43
Prune and release apple trees (108)	3.0	36
Release mast producing shrubs/trees	3.0	14
Conifer release	3.0	36
Nest boxes	3.0	14
Catch basins and fish structures	3.0	9
Construct water holes	3.0	7

Timber Outputs

Alternative 3 will generate a harvest volume of approximately 20 MBF of timber in the first entry and 23 MMBF in three to ten years from the final harvest of shelterwood seed treatments.

Alternative 4

Alternative 4 was developed primarily in response to the issue, "Should even-aged management or uneven-aged management silvicultural systems be used in the project area?" The goal of Alternative 4 is to achieve reforestation objectives and to complete salvage harvesting activities through uneven-aged treatments where they are reasonably, economically and biologically feasible. This includes taking a careful look at reasonably feasible uneven-aged treatments within all stands proposed for harvesting activities in Alternative 1. Reforestation treatments such as herbicide application, site preparation for natural regeneration, area fencing and individual tree fencing, and planting are prescribed based upon site specific needs within a stand. Table 22 in Appendix F lists the present condition of the stands considered in the East Side project proposal. Table 22 contains a column that evaluates the regeneration potential for uneven-aged management for each stand.

Where uneven-aged treatments are not feasible but commercial salvage opportunities exist, salvage harvest treatments are proposed that remove only dead and dying trees. In those stands where the mortality is severe, reforestation treatments implemented through adaptive management are also proposed. The adaptive management would be designed to monitor the impact of the residual large trees on seedling development and growth. In this alternative, harvesting only dead and dying trees is not intended to achieve either an even-aged or an uneven-aged structure. "Reforestation only" treatments are proposed in stands where severe mortality has occurred, where commercially operable sale potential does not exist, and where uneven-aged management is not biologically feasible.

Proposed Activities

The types and quantities of activities proposed in Alternative 4 are summarized in Tables 13-15. Alternative 4 maps display the distribution of the proposed treatments within the 139,990-acre zone of mortality. See Appendices B and C for a detailed list of the treatments proposed for each stand.

Vegetative Treatments

Uneven-Aged Management

Uneven-aged treatments are proposed in stands that met the following criteria (see Appendix B for a detailed discussion):

- All those stands proposed for uneven-aged treatments in Alternative 1
- Stands that have a potential seed source for shade-tolerant regeneration (35 BA of hemlock, beech, sugar maple)
- Stands that have adequately established, shade-tolerant regeneration.

Table 13 displays the total vegetative treatments proposed for Alternative 4.

Table 13. Alternative 4: Total Vegetative Treatments (acres)

Activity	MA 3.0	MA 2.0	MA 6.1	Total	Herbicide	Site Prep	Fertilize	Fence	Plant	TSI/ Release
UNEVEN-AGED										
Green										
Selection	792	63	0	855	386	349	0	43	43	63
Group Selectiom	0	154	0	154	127	154	0	0	0	154
Salvage										
Selection	1707	12	0	1719	824	967	0	20	33	12
Group Selectiom	0	115	0	115	80	115	0	47	47	115
Reforestation Only	493	60	90	643	596	459	0	391	51	35
SALVAGE										
Salvage										
Salvage Harvest	2456	0	0	2456	937	753	0	536	128	30
WILDLIFE										
Clearcut for Wildlife	9	0	0	9	0	0	0	0	0	0
Total	**5457**	**404**	**90**	**5951**	**2968**	**2797**	**0**	**1037**	**302**	**409**

Transportation Activities

Table 14. Alternative 4: Proposed Transportation System Activities

ROAD SYSTEM ACTIVITIES (Miles)	Private	MA 2.0	MA 3.0	MA 6.1	MA 6.2	Total
New Construction	0.2	0.1	9.7	0.0	0.0	10.0
Road Reconstruction						
Existing Road Betterment	1.2	0.3	10.2	0.0	0.0	11.7
Existing Road Realignment	0.2	0.0	0.9	0.0	0.0	1.1
Existing Road Restoration	6.8	6.1	71.9	0.0	2.4	87.2
Total Road Reconstruction	**8.2**	**6.4**	**83.0**	**0.0**	**2.4**	**100.0**
Existing Road Decommissioning	0.0	0.0	5.2	0.0	0.0	5.2
Temporary Road/Long Skid	0.0	0.0	0.0	0.0	0.0	0.0
Stone Pits (# of Pits)	**0**	**3**	**40**	**0**	**0**	**43**
Existing Pit Expansion	0	1	32	0	0	33
New Pit Development	0	2	8	0	0	10

Wildlife Treatments

Table 15. Alternative 4: Wildlife Treatments

Wildlife Treatments	MA	Acres
Clearcut For Wildlife Opening	3.0	9
Create/Maintain Openings	3.0	2
Regenerate Aspen	3.0	92
Seeding	3.0	54
Planting	3.0	466
Planting	2.0	187
Planting	6.1	15
Fencing	3.0	43
Prune and Release Apple trees (108)	3.0	36
Release mast producing shrubs/trees	3.0	14
Conifer release	3.0	36
Nest Boxes	3.0	14
Catch basins and fish structures	3.0	9
Construct water holes	3.0	7

Timber Outputs

Alternative 4 will generate a harvest volume of approximately 12 MMBF of timber. Any future volume will result from additional uneven-aged management treatments and will require new environmental analysis and documentation.

Alternative 5: No New Federal Action

Alternative 5 proposes that ecological processes control vegetative development within the East Side project area. No new reforestation/revegetation or harvesting activities would occur as a result of the East Side project. Activities near or within affected areas that have already been approved by past environmental assessments (see Chapter 1, Relationship to Other Documents) will still occur.

This alternative provides a baseline (reference point) against which to describe the environmental effects of the action alternatives. This is a viable alternative and responds to the concerns of those who want no management activities to take place (e.g., no timber harvest, additional roads, herbicide application, fencing, etc.).

Alternatives Considered But Eliminated From Detailed Study

There were additional alternatives considered by the ID Team that were eliminated from detailed study as fully developed alternatives. These alternatives were either suggested by the public, some in substantial detail, or were suggested by the ID Team during the analysis process. This section provides the rationale for not considering them as fully developed alternatives. The public submitted three detailed alternatives during the scoping phase of the project. They are discussed at the end of this section and are identified as Public Alternatives 1 – 3. In addition, three less detailed public alternatives are considered under the uneven aged management subheading.

Vegetation Management

There were numerous combinations of timber harvest and reforestation practices that could have been developed for this project in response to issues. As described in Chapter 1 (Need for Proposal), one of the primary needs for action is to respond to the tree mortality and decline that is taking place within this project. Both the public and the ID Team presented many scenarios that the ID Team considered. Initially, the ID team considered seven different combinations of timber harvest and reforestation practices. The Deciding Officer determined that the range of alternatives considered in detail would be adequate by including the five alternatives presented in the previous section. The analysis of effects for the five alternatives considered in detail provides the Deciding Officer with information representing a wide range of response (high levels of harvest to low or no levels of harvest, in combination with various reforestation treatments for stands impacted by severe mortality, or no reforestation treatments for such stands). The Deciding Officer determined that detailed analysis of the alternatives listed below would be redundant; it would substantially overlap with that conducted for Alternatives 1 through 5, it would not provide substantive differences in analysis results or outcomes, and it would not substantially help achieve the purpose and need for the project. Additional combinations of harvest/reforestation that were considered but eliminated from detailed study include the following:

1. Revegetate areas of severe mortality and decline and some areas that are only moderately affected by mortality and decline. No commercial harvest of any dead, declining, or living trees. To address safety and visual concerns, dead and dying trees would be felled non-commercially, and left in place, in heavily-used areas and in visually sensitive landscapes.

2. Revegetate areas of severe mortality and decline and some areas that are only moderately affected by mortality and decline. Salvage merchantable dead and dying trees only in those areas that can be logged economically. Dead and dying trees would be felled non-commercially, and left in place, in heavily-used areas and in visually sensitive landscapes.

3. Revegetate areas of severe mortality and decline and some areas that are only moderately affected by mortality and decline. Harvest trees through some combination of salvage and/or regeneration cutting. This would include the harvesting of dead and dying trees as well as some green, healthy trees.

Size of Project Area

Public comment suggested that the size of the project area could be increased to include additional areas where salvage harvest opportunities might exist. This alternative was eliminated from detailed study

because the commenter did not provide additional detail to indicate where this opportunity could be found. The ID Team established the project area boundary by examining data to determine the extent of mortality, and to propose treatments where commercially viable salvage treatments were found. Appropriate areas have already been included within this project.

Uneven-aged Management

Three specific alternatives presented by the public or the ID Team proposed the following:

Public Uneven-aged Alternative One - Commercial and Salvage Harvest using Uneven-aged Managment

- 3,476 acres of Group Management[1] (where regeneration cuts are proposed in Alternative 1).
- 2,513 acres of Salvage Selection Cutting.
- 1,752 acres of Selection Cutting.

Public Uneven-aged Alternative Two – Commercial Harvest using Uneven-aged Management

- 456 acres of Group Management
- 1,752 acres of Selection Cutting

Public/ID Team Alternative Three – practice uneven-aged management on all of the stands proposed for even-aged management in the proposed action

ID Team response to the Mortality II Court Ruling and public comment resulted in considerable review of analysis conducted as part of the Forest Plan, review of recent literature and research results, and a review of local reforestation success with uneven-aged management. All sites in the East Side project that are proposed for even-aged treatment were also considered for uneven-aged treatment, though only a subset of them were included in an alternative fully developed. The following discussion summarizes the results of that analysis. Additional details can be found in Chapter 3 (Vegetation Section), Appendix B (pp. B-15-B-17), and in Appendix F.

Summary of Forest Plan Analysis

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 trade-offs between even-aged and uneven-aged management. These trade-offs are addressed in the Forest Plan Analysis Summary and Uneven-aged Management Considerations for Project Analyses from Forest Plan Implementation and Monitoring found in Appendix E. Briefly summarized, the following are highlights from Appendix E:

- 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

[1] Group Management was defined by the commenter as synonymous with Group Selection

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 trade-offs between the effects of even-aged management versis uneven-aged management when selecting the Forest Plan preferred alternative (Alternative D). Trade-offs include effects on dispersed recreation, timber harvest volumes and values, and wildlife habitat (Appendix E, p. 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 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 direction per 36 CFR 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).

Literature Review, Research Review, and Local Success

The ID Team still felt that it was important to consider the wide-spread use of uneven-aged management. The ID Team examined research findings and monitoring results from the application of uneven-age management on the ANF. It is critical to know the biological characteristics of sites where uneven-aged management has the chance of being successful. Uneven-aged management favors shade-tolerant tree species, and over the long term would cause stands dominated by shade-intolerant species or shade mid-tolerant species to convert to shade-tolerant species (Stout in Marquis 1994, p. 330; Marquis and Johnson in Burns 1989, p. 11). Without an adequate seed source it would be either very difficult or very expensive to establish shade tolerant species. The choice of silvicultural systems in Allegheny hardwoods would be wider were it not for the unusually high deer damage to seedling regeneration on the ANF (Redding 1995; Tilghman 1989). Local silvicultural guidelines specify stands having 35 basal area of shade tolerant species as potentially providing adequate seed source for uneven-aged management (Marquis et al 1992, p. 57) though local success with uneven-aged management on these sites has been very marginal (USDA-FS 1997a, pp. 16, 17, 76, 77).

Stands having adequate shade-tolerant tree seedlings already present in the understory are also potential candidates for uneven-aged management. Within the project area, only American beech seedlings are present in sufficient quantity for stands to be classified as having adequate numbers of shade-tolerant seedlings.

Based on this information and current environmental conditions on the sites proposed for treatment, only those sites with an adequate shade-tolerant seed source or those already adequately stocked with shade-tolerant tree seedlings have the biological conditions necessary to potentially permit successful uneven-aged management. Other sites could be considered, but only with investment in extremely expensive reforestation practices, much higher in cost than those implemented to date. Even then there is still a high probability of failure (Appendix B, Vegetation Report).

The Deciding Officer determined that an alternative that considered the use of uneven-aged management on all stands was not reasonable due to the extremely high cost and because local research and monitoring data indicate that treatments on stands that do not have the biological characteristics would most likely result in regeneration failure. The Deciding Officer also determined that the Public Uneven-aged

Alternatives did not consider the biological feasiblity and very high cost of such uneven-aged management, and that they should not be considered further.

Herbicide Use

Public comment and the ID Team suggested including an alternative that does not use herbicides.

Alternatives 2 and 5 in this project do not include any herbicide use. Furthermore, Alternative B considered in the Forest Plan analysis (USDA-FS 1986, Chapter 4 p 38) did not include the use of any herbicides, but that alternative was not selected by the decisionmaker.

The Forest Plan and the FEIS for Understory Vegetation Management (USDA-FS 1991) reviewed alternatives to using herbicides (USDA-FS 1991, Chapter 2, pp 3 to 6), and concluded that herbicides are the most effective, least costly, and meet soil, water, health, and safety criteria (USDA-FS 1991, Appendix D p 29). Other reforestation methods may be used in lieu of or in addition to herbicides if they are expected to be effective on specific sites. Treatment methods including area fencing and manual treatments such as pulling or cutting unwanted vegetation were considered. When understories are dominated by plants such as dense fern or grass, beech sprouts and striped maple, seedling establishment and growth does not occur unless the inhibiting vegetation is removed. Area fencing is not effective in establishing tree seedlings in stands where inhibiting vegetation is found. Likewise, manual methods are not effective in reducing levels of interference to the point where seedlings can become established.

There have been no new technological developments since the FEIS for Understory Vegetation Management was written that would replace herbicide application as the preferred treatment. A complete analysis of alternatives and impacts to understory vegetation can be found in the FEIS for Understory Vegetation Management and the Response to Appeal #92-09-025 Herbicide Project Bradford Ranger District (East Side EIS Project File). The response to Comment 9-61 in Appendix G of this East Side FEIS provides additional information.

Old Growth

Public comments generated four alternative ways to address old growth:

1. Include an alternative with varying amounts of old growth.
2. Look at an alternative that has no additional old growth added to the project area.
3. Look at an alternative that has designated old growth as directed for MA 3.0 and 6.1 areas.
4. Have an alternative that designates old growth.

The decision to manage for old growth is made in the Forest Plan, which sets the minimum amount of old growth for each Management Area (Forest Plan: MA 2.0, p. 4-73; MA 3.0, p.4-85; MA 6.1, p.4-113). Varying amounts of old growth were considered in the Forest Plan FEIS (USDA-FS 1986, Chapter 4 pp 94-97) with Alternative A providing the most. That EIS documents the wide range of competitive interactions considered (USDA-FS Chapter 4) and presents a summary in Chapter 2 (pp 61 to 65). The Deciding Officer did not select Alternative A as the guiding management philosophy for the ANF, nor did he select Alternative C, the alternative with the smallest amount of old growth;

rather he selected Alternative D. The trade-offs he considered are documented in the Record of Decision (USDA-FS 1986b, pp 6-25), with specific mention of wildlife considerations on pp 17-19.

The evaluation of old growth in this project was based upon site-specific characteristics and values and is designed to meet old growth needs within the project area, as well as to enhance old growth across the ANF. All action alternatives meet Forest Plan direction as to the amount and distribution of old growth. Alternative 1, which impacts the greatest amount of the project area of all alternatives through vegetative management, leaves 94% of the project area unmanaged this planning period. Therefore, there is ample opportunity in the future for designation of old growth outside of proposed treatment areas once Forest Plan revision establishes spatial distribution patterns for it. Also, intermediate treatments proposed now do not preclude a stand from possible future designation as old growth. As a result, Alternatives 1-5 adequately address old-growth opportunities within the East Side project area. Therefore, there is no need to fully develop an alternative that specifically manages or designates old growth. The effects of no management are displayed in Alternative 5. See the discussion of old growth in the Wildlife section of Chapter 3 and in the Biological Assessment (Appendix C).

Wildlife

Public comment requested alternatives that provide the following:

1. An emphasis on habitat for forest interior species, and

2. Less fragmentation, more old growth, and the decommissioning of roads.

In consideration of these requests, the ID team examined how Alternatives 1-5 impact wildlife habitats, in order to determine whether or not additional alternatives should be developed. The maximum amount of activity proposed within the Project Area is 6% (Alternative 1). Other alternatives proposed less treatment than Alternative 1. Treatments that contribute towards forest fragmentation (even-aged regeneration harvests) are not proposed in Alternatives 2, 4 and 5. Treatments proposed in any alternative do not preclude the potential for old growth to develop in the future (see Old Growth discussion, above). Decommissioning of roads was considered in Alternatives 1 – 4, and there is additional discussion regarding this topic under public Alternatives 2 and 3, which follow. The Deciding Officer determined that additional alternatives that respond to these requests were not needed. Sufficient analysis of habitat for forest interior species and levels of fragmentation would result with analysis of Alternatives 1 – 5.

Recreation

Public comment proposed the consideration of an alternative that emphasizes recreation opportunities.

Recreation opportunities were reviewed within the East Side Project Area. ANF Recreation Planners did not identify a need to include recreation development proposals as part of this project. Public comment did not provide any specific proposals. It was, therefore, not necessary to have an alternative with an emphasis on recreation. However, impacts of the East Side project on recreation are considered as part of the analysis.

Most recreation projects are analyzed independently of timber management analyses for several reasons: 1) Timing – projects may be at different stages of development; 2) Funding availability – many projects

have some element of partnership or grant funding that must be used within a certain timeframe; and 3) Location – timber management and recreation proposals may not share the same project boundary.

Research Natural Area

Public comment proposed the entire Rock Run Watershed to become a Research Natural Area.

Four candidate Research Natural Areas were identified in the Forest Plan (Forest Plan FEIS, p 3-31). The Rock Run Watershed was not included in this group.

Research natural areas are part of a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity on National Forest System lands. Research natural areas should not show evidence of major disturbance by humans for the past 50 years; a pristine condition is the goal (Forest Service Manual 4063.2).

The Rock Run watershed does not meet the criteria for selection as a Research Natural Area. While the watershed does contain areas of interest (wetlands, sphagnum swamp, etc), the area as a whole has been impacted by human disturbance. Turn-of-the century logging occurred throughout the watershed. Portions of the watershed were active farmsteads until the 1950's. Some areas were planted to white spruce and red pine. In addition, portions of the watershed received a diameter limit cut in the 1960's where trees greater than twelve inches were harvested prior to Forest Service acquisition (which occurred in the 1970's). This pattern of recent human disturbance makes this area unsuitable as a candidate research natural area.

Public Alternative 1 – No Logging, Zero Cutting, Maximize Watershed Protection, Maximize Old Growth, Obliterate Roadways

This alternative proposes a management strategy that includes the following:

1. **No logging, Zero cutting (Source: public comment)**

   A complete description of this alternative can be found in the project file. This alternative, when considered in it's entirety presents a management philosophy that is not compatible with current Forest Plan direction. It proposes management actions that do not provide the mix of goods, services and uses to the public that maximize net public benefit assumptions used in the Forest Plan. The Deciding Officer determined that analysis of this alternative is beyond the scope of this project and that it does not respond to the purpose and need stated for the East Side project. This alternative would be more appropriately addressed in an analysis that looks at broader planning issues, such as Forest Plan revision.

   Also, no logging, or "zero cutting", as described in this comment, is not consistent with Forest Service enabling legislation, is a national issue, and therefore is beyond the scope of this analysis.

2. **Maximize old growth (Source: public comment)**

   See the Old Growth discussion in the "Old Growth" subsection above.

3. **Maximize watershed protection (Source: public comment)**

Watershed protection in areas proposed for management activities is always a driving factor for Allegheny National Forest projects. All of the action alternatives consider road realignment (to determine if moving an existing road to a different location can reduce sedimentation), limestone surfacing (to minimize the effects of road surface run off), and decommissioning of roads no longer required to be part of the ANF road system (to minimize any effects from unnecessary roads). Consideration of these activities and the inclusion of specific mitigation measures to reduce sedimentation are part of every project proposal. Please see the Watershed, Transportation and Wildlife sections of Chapter 3.

4. Obliterate roadways (Source: public comment)

All roads within the project area have been examined to ensure that they are necessary for present and future management of the ANF. Roads that are no longer necessary are proposed for decommissioning. See the Transportation section of Chapter 3.

This alternative was eliminated from detailed study because it was determined that its main elements had already been included in Alternatives 1-5. As a complete alternative, it would not meet the needs for the East Side project identified in the "Need for the Proposal", as described in Chapter 1.

In conclusion, many elements of this alternative are considered in the Alternatives Considered in Detail. Alternative 5 proposes no harvest or reforestation treatments and discloses the effects (both short term and long term) on vegetation. Alternative 5 maintains stands within current age classes, and by default, results in the greatest amount of old growth. Alternatives 1 through 4 address watershed concerns by proposing levels of road management and improvements to roads. Moderately to well-stocked forests protect watersheds. Alternatives 1 through 5 look at a range of residual stocking levels that contribute towards watershed protection. Decommissioning of roads are considered in Alternatives 1 – 4. Roads identified that are not needed for long-term management are proposed for decommissioning.

Public Alternative 2 - Watershed Improvement Alternative (Source: public comment. The complete proposal is contained in the project file.)

This is a specific proposal submitted by a member of the public during the scoping process. The objective is to combine “the benefits of No Action with the benefits of the Alternative Action". A copy of the complete proposal can be found in the project file. The following is a summary of the proposed activities:

- **Salvage Brushing on 5,646 acres.**

  ”Salvage Brushing” is not a familiar term to silviculturists on the Allegheny National Forest. Clarification was requested from the commentor who proposed this alternative. The explanation received stated that, “’Salvage Brushing’ doesn't involve cutting of any kind. This is a method that people have used with some success on old growth beech forests in Canada. It involves the manual removal of scale insects from the exterior bark of the American beech trees using brushes. Done correctly, it would not cause any scarring of the exterior bark and should be done by workers or volunteers without the use of machinery (thereby seriously reducing the danger of stress inducers such as soil compaction)."

  The Northeastern Research Station at Irvine, PA, (USDA Forest Service) was contacted to find out whether “Salvage Brushing” is a viable method to use to stop or slow the spread of beech bark disease. We were referred to Dr. David Houston, the current leading expert on beech scale complex.

Dr. Houston said that some time ago he had been contacted by the manager of the Halifax (Canada) Public Garden and was asked if there was some way to protect a *few special trees in his arboretum* without using insecticides. He suggested the treatment described above (brushing with detergent). In a follow-up conversation, he learned that the technique was working to preserve four special trees, but that it was at a significant cost (Houston, pers. comm.).

Dr. Houston said that it is possible to remove scale insects using a stiff brush and a detergent or other solvent. He stated that this would not be a practical technique in a forest setting, because it would be nearly impossible to remove all the insects with one treatment. The most successful scale insects find very narrow cracks or fissures to inhabit, and they would be very difficult to remove from that location, even with a brush. The crawler stage of the scale insect lasts from late July to well into fall. After a "Salvage Brushing" treatment it is very likely that other eggs would hatch, and crawlers would move throughout the tree. These individuals would then reproduce and re-infest the entire tree. Also, the scale insects inhabit the entire bole of the tree as well as some of the lower branches. It would be extremely time consuming and hazardous to clean that much bark area. Therefore, this is neither a biologically nor economically feasible method of controlling beech scale complex in a large, forest setting such as the East Side project area.

- **White pine and hemlock planting on all edge acreage to shade the forest floor and suppress the development of light tolerant species of vegetation such as fern and grass to improve species diversity within the understory of the interior of the forest.**

  Native conifer planting is prescribed for Alternatives 1, 3, and 4, although not in the manner suggested here. Planting white pine and hemlock along the edge of all harvest areas would not necessarily suppress the development of light loving, interfering species such as fern and grasses as described in this proposed alternative. Local experience shows it is difficult to establish planted seedlings in a shaded environment. It is also an impractical way to establish enough shade to prevent the invasion of fern and grass. If the white pine and hemlock did become established, they could suppress the development of a wide variety of desirable species.

- **Salvage Brushing along a 300-foot stretch along the most likely sources of spread of the beech scale complex**

  See comment on salvage brushing above.

- **Road Obliteration 7.1 to 80.4 miles of roads. The obliteration quantity would have to be determined based upon the following factors:**

  1) **All roads should be considered for obliteration.**

  2) **All roads required by OGM personnel to access private mineral rights should be Restored (see below).**

  3) **All roads required by private inholders should be restored (see below).**

  4) **All old trails and roads which are currently already revegetating should be allowed to do so naturally. (Plant white pine and hemlock within 100-150 feet from edge to prevent invasive interfering plants. Obliteration opportunities would be foregone.)**

  5) **All low stream crossings should be obliterated with special care not to increase sediment discharge into the streams.**

6) **All roads not needed for other purposes as itemized in #2-4 should be obliterated for the ecological recovery of the area.**

Large-scale obliteration of roads would not maintain access to the project area for future management or recreational activities as intended in the Forest Plan for MAs 2.0, 3.0, and 6.1. MAs 2.0 and 3.0 are designated to provide a roaded natural setting for all dispersed and developed recreation opportunities, with an emphasis on motorized recreation in MA 3.0 (Forest Plan, pp.4-70, 4-82). MA 6.1 emphasizes a variety of dispersed recreation activities in a semi-primitive motorized setting (Forest Plan, pp. 4-110). Road decommissioning is proposed in all action alternatives for those roads which are no longer needed for present or future management of the area.

The Forest Service does not have the authority to require OGM operators to "restore" their roads.

Roads necessary for access by private inholders are authorized under a Special Use Permit. The specifications for construction and maintenance are issued along with the permit. All roads are required to be maintained according to the conditions of the permit.

All stream crossings are examined during project analysis. Stream crossings not needed for present or future management are removed. Mitigation measures are prescribed to reduce sedimentation of streams for crossings that remain in place.

- **Road Restoration should occur on up to 80.4 miles of roads and should occur on all roads not scheduled for obliteration.**

All roads are examined during the analysis process. Based on the existing condition of the roads, recommendations are made as to the type of work necessary to make sure that they meet the standard necessary for the intended use. These recommendations are then carried forward to the proposed action for a particular project. The decision document for a project proposal makes the decision as to the type of work necessary to ensure the roads meet the proper standard. Roads not necessary for implementation are maintained in order to meet resource protection needs or are decommissioned if no long-term needs are identified. Except in unusual cases, roads are not scheduled for restoration until a project is proposed.

- **The Road-Realignment should be considered.**

The same process as described above regarding road restoration applies to this proposal. The alignment of all roads necessary to carry out a project proposal is examined, and those that need to be realigned in order to protect resources are carried forward to the decision document.

- **Road Re-construction and New Construction activities will degrade water quality through increased short term and long term sediment discharges.**

Mitigation measures are used during periods of construction and reconstruction to minimize the amount of sediment that will reach a stream. Properly designed and maintained roads will not cause water degradation.

- **All Habitat Improvements listed at the bottom of page 6 in the Proposed Action should concluded (sic.) unless those species being planted are non-native or invasive (sic.).**

Native species are used for wildlife habitat improvement.

Road management proposals presented here would support access needed for the the minimal vegetative management proposed in this public alternative, however it would not support the kinds and amounts of vegetative managementor the type of recreation or wildlife enjoyment activities authorized by the Forest Plan. While Alternatives 1 – 4 propose similar kinds of road management activities (obliteration, restoration and re-alignment) as suggested here, the amounts are much less. The proposal for no road construction or reconstruction (betterment) is addressed in Alternatives 3 and 5.

This alternative, when considered in its entirety, presents a management philosophy that is not compatible with current Forest Plan direction. It proposes management actions that do not provide the mix of goods, services, and uses to the public that maximize net public benefit according to the Forest Plan. The Deciding Officer determined that analysis of this alternative is beyond the scope of this project. It was eliminated from detailed study because it would not meet the Purpose and Need as described in Chapter 1, some activities proposed are not practical or feasible, nor would it meet the Forest Plan objectives for the East Side project area. It would be more appropriately addressed in an analysis that focuses on broader planning issues, such as Forest Plan revision.

Public Alternative 3 - Ecological Restoration Alternative (Source: public comment. The complete proposal is contained in the project file.)

This is a specific proposal submitted by a member of the public during the scoping process. The objective is to combine "the benefits of No Action with the benefits of the Alternative Action" and "looks more aggressively at restoring the area to an ecological reserve." A copy of the complete proposal can be found in the project file. This suggested alternative contains all of the same proposals as the "Watershed Restoration Alternative" above, as well as the following additional proposals:

- **All roads within the East Side Project Area that are not needed for either private land access should be converted to trails (sic.). The trails, created by this alternative "Roads to Trails" program should emphasize non-motorized recreation such as hiking, mountain biking, dog walking, berry picking, cross country skiing, bird watching, and snow shoeing but should also include trails for snowmobiles (sic.)**

  Converting all roads, which are not needed for access to private land, is neither part of the purpose and need identified for this project in the "Need for the Proposal", Chapter 1 nor is it in compliance with the goals and objectives of the Forest Plan. The Forest Plan designates special areas for this type of use. Most non-motorized trails receive low use, which indicates that supply exceeds demand. The ANF has met it's goal for the number of miles of snowmobile trail as defined in the Forest Plan and is directing efforts to meet Forest Plan goals for ATV trails. Further, snowmobile trails and other motorized trails are only appropriate in ORV Intensive Use Areas as defined in the Forest Plan. Not all of the East Side project area is within ORV Intensive Use areas.

- **The snowmobile Groups should be explicitly asked what kinds of needs are required for the ASL Trail in this area. Signs showing that volunteers did work in this area should be posted.**

  See the preceding paragraph.

  Trail volunteers are recognized at the trailheads with signs that recognize their work. The ANF has hundreds of volunteers working in various resource areas every year. It is neither practical nor desirable to erect signs of recognition at every volunteer work site. Snowmobile volunteers are recognized at the Longhouse Trailhead and in the MACA Building in Marienville

- **Road activity near the hawk nest in stand 2 at Thomas Rock should be foregone. The beginning of this road should be obliterated and planted with hemlock to restrict human access and light intrusion.**

  Our records do not indicate the presence of a hawk nest in stand 2 in the Thomas Rock vicinity. There is a nest in Compartment 827 in the vicinity of stands 24, 51, and 34. These stands have mitigation measures to protect the nest (seasonal road building, logging, and hauling restrictions with no activity allowed between March 1 and July 31). There is also a 660-foot no-cut buffer around the nest. If similar nests are discovered, they will be given the same mitigation measures if necessary to protect the nest inhabitants.

This proposal, which would convert existing roads to trails, would substantially modify existing access to the project area. ANF Recreation Planners assessed recreation needs within the project area and did not find a need to propose additional trails. Most non-motorized trails receive low use, which indicates that supply exceeds demand. Forest Plan goals for miles of snowmobile trail have been met. ATV trail needs are being addressed in separate analyses. Project proposals, however, will be made within the Intensive Use Areas identified in the Forest Plan (Forest Plan, p. 4-10). This alternative was eliminated from further consideration for the same reasons as the Watershed Restoration Alternative above.

Comparison of Alternatives

This section provides a summary comparison of the alternatives. For a detailed discussion of the effects of each alternative, see Chapter 3.

Comparison of Alternatives to the DFC for each Management Area

Tables 16, 17, and 18 provide a comparison of how each alternative moves from the existing condition towards the Desired Future Condition by Management Area.

Table 16. Comparison of DFC to EC and Future Condition by Alternative for MA 3.0.

MA 3.0									
DFC				Existing Condition	At the end of the next decade - 2009				
					Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Vegetative Management									
Age-Class Distribution	Even-aged timber stands distributed across a variety of age classes	0-10 (seedling)	9%	6%	3%	0	2%	0	0
		11-20 (sapling	9%	7%	6%	6%	6%	6%	6%
		111+ (old growth)	Min 5%	1%	4%	6%	5%	6%	6%
Wildlife									
0-20 year age class	Not greater than 20-25 %			13%	9%	6%	8%	6%	6%
50% or more of the project area in mast-producing timber (>35 years old)				84%	81%	85%	83%	85%	85%
Permanent openings	3-10%			2%	2%	2%	2%	2%	2%
Conifer component	No more than 10% in conifer cover			4%	4%	4%	4%	4%	4%
Stocking levels	Limit land area poorly stocked with trees to acres existing in 1986		+0 acres	+1972 acres	+66 acres	+1806 acres	+121 acres	+849 acres	+1806 acres

Table 17. Comparison of DFC to EC and Future Condition by Alternative for MA 2.0.

MA 2.0								
DFC			Existing Condition	At the end of the next decade - 2009				
				Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Vegetative Management								
Permanent openings	1-3%		>1%	>1%	>1%	>1%	>1%	>1%
Conifer component	No more than 10% in conifer cover		3%	3%	3%	3%	3%	3%
Uneven-age structure	Initiate structure development by conducting selection harvest on 97%		36%	60%	36%	60%	60%	36%
Stocking levels	Limit land area poorly stocked with trees to acres existing in 1986	+0 acres	+12 acres	+12 acres	+12 acres	+12 acres	+12 acres	+12 acres

Table 18. Comparison of DFC to EC and Future Condition by Alternative for MA 6.1.

MA 6.1								
DFC			Existing Condition	At the end of the next decade - 2009				
				Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Vegetative Management								
Old growth (stands <111)		Min 5%	0	4	4	4	4	4
Wildlife								
Pole timber and saw timber will comprise a minimum of 70% (greater than 20 years old)			94%	96%	96%	96%	96%	96%
Permanent openings	3-10%		2%	2%	2%	2%	2%	2%
Conifer component	No more than 10% in conifer cover		13%	13%	13%	13%	13%	13%
Stocking levels	Limit land area poorly stocked with trees to acres existing in 1986	+0 acres	+70 acres	+0 acres	+70 acres	+0 acres	+0 acres	+70 acres

Comparison of Alternatives to the Project Needs

Table 19 displays the amounts of proposed activities by alternative. It also displayes the responsiveness of the proposed activities to the needs and opportunities identified in Chapter 1 (pp. 4-5).

Table 19. Summary Comparison and Responsiveness of Alternatives to the Needs and Opportunities Identified for the East Side Project

Activity	MA	Need/Opportunity	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Regeneration Harvest – Green (acres)							
Clear-cut	3	2,4,5,6,7	112	0	40	9 (WL)	0
Shelterwood seed cut (1st entry)/ Removal cut (2nd entry)	3	2,4,5,6,7	589	0	252	0	0
Shelterwood removal cut	3	2,4,5,6,7	29	0	29	0	0
Shelterwood removal cut (delay)	3	2,4,5,6,7	88	0	72	0	0
Prep cut / Two-aged	3	2,4,5,6,7	142	0	71	0	0
Reforestation treatments only	3	2,4,7	76	0	76	0	0
Regeneration Harvest – Salvage (acres)							
Clear-cut	3	1,2,4,5,6,7	84	0	84	0	0
Shelterwood seed cut (1st entry)/ Removal cut (2nd entry)	3	1,2,4,5,6,7	1284	0	1156	0	0
Shelterwood removal cut	3	1,2,4,5,6,7	58	0	58	0	0
Shelterwood removal cut (delayed)	3	1,2,4,5,6,7	592	0	470	0	0
Prep cut / Two-aged	3	1,2,4,5,6,7	71	0	32	0	0
Two-aged	3	1,2,4,5,6,7	132	0	130	0	0
Reforestation treatments only	2,3,6.1	1,2,4,7	178	0	420	0	0
Intermediate Treatments (acres)							
Green Thinning	3	3,5,6	1778	0	535	0	0
Salvage Thinning	2,3	3,5,6	2479	4164	1904	2456	0
Uneven-aged – Green (acres)							
Selection	2,3	2,4,5,6,7	118	0	77	855	0
Group Selection	2	2,4,5,6,7	154	0	154	154	0
Transition Cut	3	2,3,5,6,7	18	0	18	0	0
Uneven-aged Salvage (acres)							
Selection	2,3	1,2,4,5,6,7	40	0	12	1719	0
Group Selection	2	1,2,4,5,6,7	115	0	115	115	0
Reforestation treatments only	2,3,6.1	1,2,4,7	0	0	0	643	0

Activity	MA	Need/Opportunity	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Reforestation Treatments (acres)							
Herbicide	2,3,6.1	1,2,4	3419	0	2954	2968	0
Site Preparation	2,3,6.1	1,2,4	3044	0	2575	2797	0
Fertilization	2,3,6.1	1,2,4	1293	0	1074	0	0
Fence Construction	2,3,6.1	1,2,	2282	0	1962	1037	0
Planting	2,3,6.1	1,2,4	797	0	716	302	0
TSI/Release	2,3,6.1	1,2,3,4	576	0	560	409	0
Kane Experimental Forest Treatments (ac)							
Shelterwood, low shade removal	8	1,2,5	3	3	3	3	0
Shelterwood, low shade removal (herbicide)	8	1,2,5	3	3	3	3	0
Shelterwood (inadequate regeneration)	8	1,2,5	3	3	3	3	0
Shelterwood (adequate regeneration)	8	1,2,5	3	3	3	3	0
Delayed Shelterwood, low shade removal	8	1,2,5	3	3	3	3	0
Clearcut	8	1,2,5	3	3	3	3	0
Herbicide	8	1,2,5	6	6	6	6	0
Transportation System Activities							
New Construction (miles)	pvt,2,3	6	15.2	8.3	0	10.0	0
Reconstruction (miles)							
Betterment	pvt,2,3	6	16.0	9.4	0	11.7	0
Realignment	pvt,3	6	1.5	0.9	0	1.1	0
Restoration	pvt,2,3,6.1,6.2	6	92.0	80.6	86.7	87.2	0
Decommissioning	3	6	7.2	5.2	2.0	5.2	0
Temporary road/Long skid		6	0	0	3.5	0	0
Stone Pits (each)							
Existing Pit Expansion	2,3	6	33	28	26	33	0
New Pit Development	2,3	6	10	8	7	10	0

Activity	MA	Need/Opportunity	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Wildlife Treatments (acres)							
Create/Maintain openings	3	7	2	0	2	2	0
Regenerate Aspen	3	7	92	0	92	92	0
Seeding	3	7	54	0	54	54	0
Planting	2,3,6.1	7	668	0	668	668	0
Fencing	3	7	43	0	43	43	0
Prune and Release Apple Trees	3	7	36	0	36	36	0
Release mast producing shrubs/trees	3	7	14	0	14	14	0
Conifer release	3	7	36	0	36	36	0
Nest Boxes (each)	3	7	14	0	14	14	0
Catch basins and fish structures (each)	3	7	9	0	9	9	0
Construct water holes (each)	3	7	7	0	7	7	0
Volume							
Harvest Volume (first entry) (MMBF)			**34**	**6**	**20**	**12**	**0**
Harvest Volume (3-10 years) (MMBF)			**30**	**0**	**23**	**0**	**0**
Cash Flow Analysis (million $)							
Value of Timber Forgone*			**(-1.0)**	**(-1.3)**	**(-1.4)**	**(-1.3)**	**(-3.2)**
Net Cash Flow			**2.3**	**(-2.2)**	**1.7**	**(-3.4)**	**(-0.5)****

**** Represents dead trees that already died due to the delay in harvesting and trees that will die within the next five years.***
***** Represents planning costs.***

Comparison of the Alternatives to the Issues

Table 20 displays the comparison of of the alternatives and their response to the unresolved issues identified in Chapter 1.

Table 20. Comparison of Issues By Alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
The Amount of Timber Harvesting					
Issue: "What level of timber harvest should occur in the East Side project area?"					
Acres of Timber Harvesting					
Even-aged Regeneration Harvest	3,163 Ac	0 Ac	2,391 Ac	0 Ac	0 Ac
Even-aged Intermediate Harvest	1,778 Ac	0 Ac	535 Ac	0 Ac	0 Ac
Uneven-aged Harvest	445 Ac	0 Ac	376 Ac	2,843 Ac	0 Ac
Salvage Thinning	2,479 Ac	4,164 Ac	1,904 Ac	2,456 Ac	0 Ac
Other harvest	18 Ac	0 Ac	3 Ac	9 Ac	0 Ac
Total Acres	7,883 Ac	4,164 Ac	5,209 Ac	5,308 Ac	0 Ac
Long-term sustainability of the forest resource					
% Acres where overstory > 50% stocked, after treatment	93%	71%	91%	71%	71%
% of low-stocked acres with adequate #'s of tree seedlings, after treatment	**96%**	**8%**	**94%**	**58%**	**8%**
% acres (8,137 acres in total project) with adequate #'s of Tree Seedlings, after treatment	43%	8%	36%	11%	8%
Transportation System Activities Necessary to Complete Harvesting Activities:					
New road construction	15.2 Mi	8.3 Mi	0 Mi	10.0 Mi	0 Mi
Reconstruction –Betterment	16.0 Mi	9.4Mi	0 Mi	11.7 Mi	0 Mi
Reconstruction – Realignment	1.5 Mi	0.9 Mi	0 Mi	1.1 Mi	0 Mi
Reconstruction - Restoration	92.0 Mi	80.6 Mi	86.7 Mi	87.2 Mi	0 Mi
Temporary Road/Long Skid	0 Mi	5.2 Mi	3.5 Mi	0 Mi	0 Mi
Volume/Value of Timber Harvested	64.2 MMBF $18,473,086	5.7 MMBF $1,880,088	42.7 MMBF $13,106,122	12.5 MMBF $3,784,738	0 MMBF $0

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
The Amount of Salvage Harvesting					
Issue: "Should only dead, dying, and damaged trees be salvage harvested?"					
Percent of acres where dead and dying material is salvaged and utilized	100 %	100 %	82%	100 %	0 %
Value of lost salvage volume, includes value of volume lost since onset of mortality in 1994	$970,271	$1,299,887	$1,479,618	$1,251,828	$3,186,872
The Use of Herbicide and Reforestation Treatments to Help Sustain Forest Cover					
Issue: "Should herbicides be used as a reforestation treatment?"					
Reforestation Activities:					
Herbicide application	3,419 Ac	0 Ac	2,954 Ac	2,968 Ac	0 Ac
Site preparation	3,044Ac	0 Ac	2,575 Ac	2,797 Ac	0 Ac
Fertilization	1,293 Ac	0 Ac	1,074 Ac	0 Ac	0 Ac
Fencing	2,282 Ac	0 Ac	1,962 Ac	1,037 Ac	0 Ac
Planting	797 Ac	0 Ac	716 Ac	302 Ac	0 Ac
Total Acres of Treatment (includes some acres that receive multiple treatments)	**8,137Ac**	**4,164 Ac**	**5,705 Ac**	**5,951 Ac**	**0 Ac**
Potential Risk to Human Health and Wildlife/Aquatic Species	**Negligible**	**None**	**Negligible**	**Negligible**	**None**
Response to reforestation needs and opportunities	**Alternatives will be ranked based upon the number of acres of reforestation treatments proposed in areas where stocking levels are low and the treatments are anticipated to be successful**				
	good	poor	good	moderate	poor
The Level of Road Activity					
Issue: "What level of construction of new roads and reconstruction of existing roads should be implemented in the project area?"					
Road density:					
MA 2.0	3.1 Mi/Sq Mi	3.1 Mi/Sq Mi	3.1 Mi/Sq Mi	3.1 Mi/Sq Mi	2.9 Mi/Sq Mi
MA 3.0	2.3 Mi/Sq Mi	2.2 Mi/Sq Mi	2.1 Mi/Sq Mi	2.2 Mi/Sq Mi	2.1 Mi/Sq Mi
MA 6.1	2.1 Mi/Sq Mi	2.1 Mi/Sq Mi	2.1 Mi/Sq Mi	2.1 Mi/Sq Mi	2.1 Mi/Sq Mi
Existing road corridor added to Forest Service road system	33.9 Mi	18.6 Mi	1.8 Mi	23.1 Mi	0 Mi

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Road activities:					
New road construction	15.2 Mi	8.3 Mi	0.0 Mi	10.0 Mi	0.0 Mi
Reconstruction –Betterment	16.0 Mi	9.4Mi	0.0 Mi	11.7 Mi	0.0 Mi
Reconstruction – Realignment	1.5 Mi	0.9 Mi	0.0 Mi	1.1 Mi	0.0 Mi
Reconstruction - Restoration	92.0 Mi	80.6 Mi	86.7 Mi	87.2 Mi	0.0 Mi
Temporary Road/Long Skid	0.0 Mi	5.2 Mi	3.5 Mi	0.0 Mi	0.0 Mi
Stone pits:					
Existing	33	28	26	33	0
New	10	8	7	10	0
Even-Aged/Uneven-Aged Management					
Issue: "Should even-aged management or uneven-aged management silvicultural systems be used in the project area?"					
Total acres of even-aged management	7,618 Ac	0 Ac♦	5326 Ac	0 Ac♦	0 Ac
Total acres of uneven-aged management	445 Ac	0 Ac	376 Ac	4,592 Ac	0 Ac
Cash Flow Analysis					
Total cost (Includes cost of reforestation)	$16,173,085	$4,099,737	$11,387,368	$7,193,150	$521,192
Total revenue	$18,473,086	$1,880,088	$13,106,122	$3,784,738	$0
Net cash flow	**$2,300,001**	**(-$2,219,648)**	**$1,718,754**	**(-$3,408,412)**	**(-521,192)**
	Alternatives are evaluated based upon total acres of reforestation applied, and silvicultural method employed (regeneration success based upon 1998 ANF Monitoring and Evaluation Report)				
Acres where regeneration success is anticipated based upon past ANF success trends	High	Low	High	Moderate	Low
	Future stand value is dependant upon species composition that results from treatments applied in East Side units.				
Future stand value	High	Low	High	Moderate	Low

♦ The objective of salvage thinning in Alternatives 2 and 4 to utilize wood fiber and saw timber whose economic value would be lost if not harvested within the next 5-10 years. Alternative 2 proposes to remove (salvage) the dead and dying trees where salvage harvesting is economically feasible. Harvesting only dead and dying trees is not intended to achieve either an even-aged or an uneven-aged structure.

Comparison Of Alternatives By Resource

Physical Environment

Ecological Landtypes

Potentially, there could be three broad environmental consequences of this project on soils and landforms: 1.) surface disturbance which includes compaction, soil displacement, rutting, puddling, and erosion, and loss of landform from road construction and rock pit excavation; 2.) changes in the nutrient cycling; and 3.) loss of productivity in terms of a loss of growing medium from rock pit excavation and long term, but still retrievable, loss through road placements.

Table 21 summarizes the effects of the alternative treatment proposals for items 1 and 3 listed above.

Table 21. Summary of Activities Affecting Soils and Landforms by Alternative

Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5 No Action
Potential Disturbance/Treatment Areas	1,197 ac	633 ac	798 ac	802 ac	0
Herbicide and Fertilization Disturbance	337 ac	0	287 ac	193 ac	0
Fencing	29 ac	0	25 ac	12 ac	0
Vegetation Removal for Road Activity	101 ac	62 ac	24 ac	64 ac	0
Returned by Decommissioning	31 ac	23 ac	9 ac	23 ac	0
Pit Expansion and Development	40 ac	33 ac	30 ac	40 ac	0

The following discussion summarizes effects related to item 2 above. The cycling of nutrients is a constant process. The nutrient cycle is affected by how much biomass is harvested, how it is harvested, how often it is harvested, and how quickly the site has an increase in growing biomass. Two processes were analyzed in Chapter 3: carbon and nitrate cycling. By 2019, the increase in younger, faster growing stands capable of accumulating carbon in Alternatives 1 and 3, balanced with the mixture of older stands which have high carbon storage, would provide more opportunity to maximize the carbon storage potential of the area than the other alternatives.

Given the activities associated with the East Side project and local evidence, it is not likely that nitrate concentrations will move towards unacceptable levels or unacceptable off-site movement of nitrates. The differences between the alternatives relate to the potential of the forest floor to remain fully functional and the potential for the sites to be moderately to well stocked with forest cover. Long term, the effect of harvesting and the higher levels of reforestation activities prescribed in Alternatives 1 and 3 are expected to produce much higher tree stocking and a much more functional forest floor than that which would result from the implementation of Alternatives 2, 4, or 5. Alternatives 1 and 3, long term, are expected to result in 91% to 93% of the stands having >60% stocking while 71% of the sites are expected to have tree stocking >60% in Alternatives 2, 4, or 5.

Water

The proposed activities are located in portions of 11 different larger watersheds within the zone of mortality. Within these larger watersheds, there are several smaller watersheds where vegetation management and corresponding road activities are proposed. Runoff from dirt and gravel roads has the greatest effect on water quality. Since the majority of road runoff comes from streams within 200 feet of a road, the effects are measured by examining roads within 300 feet as well as stream crossings to ensure any potential runoff was evaluated.

Many of the existing roads in the project area that are located within 300 feet of streams are surfaced with pit-run sandstone. This material breaks down at a higher rate than limestone. Monitoring has shown that surfacing roads with limestone results in a significant reduction in sediment concentration and turbidity. Runoff from road segments located in close proximity to streamcourses will continue to contribute additional runoff to streams. However, the amount of sediment will be reduced from what is currently occurring as a result of the limestone surfacing.

Chapter 3 discusses individual watersheds within the project area. In summary, Alternative 1 would have 31 miles of road within 300 feet of stream courses surfaced with limestone while Alternatives 2 and 3 would each have approximately 28 miles, and Alternative 4 would have an estimated 29 miles. Alternative 5 would maintain the current situation of 15.5 miles of limestone-surfaced roads. The number of stream crossings surfaced with limestone will increase in Alternatives 1-4. Alternative 5 maintains the current situation of 29 crossings surfaced with limestone.

Transportation

As discussed in the Purpose and Need section of Chapter 1, there is a need to provide an adequate transportation system for both the short and long term access for the management of the National Forest lands within the East Side Project Area. The amount of road construction activity and decommissioning varies by alternative. Please see Table 19 for a summary of proposed transportation activities. Alternative 1 proposes the most road activity followed by Alternatives 4, 2 and 3. Alternative 5 is the No Action Alternative and proposes no road building or reconstruction.

Oil, Gas, and Minerals

Associated with the road construction and reconstruction activities is the need for sources of surfacing material. Such material comes from existing stone sources (pits) on the ANF. This project would require the maximum expansion of 33 existing pits and creation of 10 new pits for surfacing material. The loss of stone is considered an irretrievable, irreversible action. Less road activities associated with Alternatives 2 and 3 would require less pit expansion or development. Under the No Action Alternative, no loss of stone or pit development would occur as a result of this project.

Biological Environment

Vegetation

The major differences between alternatives are in the amount of acreage being regenerated, the amount of dead and dying trees being harvested, and the silvicultural system proposed.

Alternative 1 emphasizes even-aged management techniques in MA 3.0 and uneven-aged management in MA 2.0. This alternative proposes 3,181 acres of even-aged regeneration harvesting and reforestation treatments, 4,257 acres of even-aged intermediate treatments, and 445 acres of uneven-aged management treatments. Regeneration harvests will, in general, take advantage of the window of opportunity to establish new stands. Opening up the forest floor to increased light will allow seedlings to become established. The different types of regeneration harvests are in response to site specific conditions. Of the 3,181 acres of regeneration treatments, 2,221 are generated by a need to reforest declining stands and salvage dead and dying trees. The remaining 960 acres are considered green treatments, however, this does not mean that they are completely healthy. The vast majority of the green treatments are also experiencing mortality and decline. They have not reached the threshold that would put them into the salvage category. Dead and declining trees will be removed and sold as part of the Allegheny National Forest timber sale program. Intermediate harvests will remove dead and dying trees in declining stands and allow for increased growth on the trees not removed during the thinning process. Uneven-aged management is proposed on 101 acres of MA 3.0 and 344 acres of MA 2.0. Alternative 1 proposes the most area for all types of silvicultural treatments.

Alternative 2 emphasizes salvage thinning of 4,220 acres of trees that are already dead or expected to die within the next 5 to 10 years. No healthy appearing trees would be harvested. Regeneration would not be initiated until evaluated as part of a project for a future entry. Many of the stands would remain in an understocked condition until future treatments are prescribed for these areas. Ninety-eight percent of the stands have interfering vegetation in the understory, and since no treatments are proposed to eliminate it, the understory conditions are expected to remain in the same condition.

Alternative 3 analyzes the same units as Alternative 1 except that it eliminates any stands that would require new road construction or reconstruction-betterment in order to access them. Regeneration harvests are proposed on 2,377 of the 3,181 acres prescribed for Alternative 1. Intermediate harvests are proposed on 2,439 of the 4,257 acres prescribed for Alternative 1. The acreage of uneven-aged management proposed drops from 445 acres to 376 acres. With one exception, the effects on the areas treated will be the same as described for alternative 1. That exception, 224 acres of low stocked stands where regeneration harvesting was dropped but reforestation treatments would still be implemented, would have the opportunity for tree seedlings to develop, but shade from residual trees may limit seedling/saplings from developing into large trees. Other stands that were eliminated in order not to build and upgrade roads will progress as described in the No Action Alternative (Alternative 5).

Alternative 4 emphasizes the use of uneven-aged management. It examines stands that are included in Alternative 1 and selects those that may be adaptable to an uneven-aged condition without high investment costs. Salvage thinning on 2,456 acres is included in order to capture dead and dying trees from stands that are not adaptable to uneven-aged management. Uneven-aged management is proposed on 2,843 acres utilizing individual tree selection and group selection techniques. Deer browsing is a concern in utilizing this management technique. The success of selection cutting depends on the establishment of a new age and size class at each cut and the eventual growth of these stems into the main crown canopy. Interfering plants have to be taken into consideration when selection areas for uneven-aged management since they affect the success of obtaining regeneration. As a general statement, the use of uneven-aged management will cause a shift from shade intolerant species to shade tolerant species and there is uncertainty about the success rate.

Under **Alternative 5**, no action, there will be no change in the character of the vegetation due to management activities. Changes currently taking place due to maturity or decline will continue. The rate of change will be set by the interaction of natural forces such as additional drought, insect defoliations, or windstorms. Much of the tree vegetation is still in a stressed state and a new occurrence of stressors could again accelerate decline.

Where decline is currently severe, change can be expected throughout the current vegetative patterns. Many individual trees currently in decline will die soon or continue to die over the long term. Some currently in decline will survive but their boles and crowns will deteriorate and not function as complete trees. Declining tops and dying trees will permit more sunlight to reach the forest floor, encouraging expansion and growth in understory vegetation. High-density deer populations will selectively browse understory plants to the extent that only a few resistant species will dominate. Over time, the seed-producing overstory will decline to the point where inadequate amounts of seed will be produced for successful, natural regeneration. At the same time, the dense, deer resistant understory would create poor seed germination conditions or would prevent seedlings from becoming established.

Over time, a patchy forest would develop. Surviving overstory trees would vary in stocking with higher stocking levels on mid to lower slopes. Plateau and transition slope areas would have low or sparse overstories with numerous gaps or openings of up to several acres in size. These open canopy areas would have a mixture of open grass and fern patches, dense mixed or monoculture sapling stands of blocks of striped maple, beech, or sweet birch. The vertical diversity would be somewhat diverse between the overstory and developing midstory.

Over a longer period (>50 years), decline in the overstory would continue, and the sapling patches would develop into pole-sized trees. Striped maple would be cycling back to sapling stage while beech would begin to show the more severe effects of scale complex. Open fern and grass patches would be reduced through encroachment from striped maple, beech, and sweet birch.

There is no past experience to observe this kind of vegetative pattern. It is likely that in 100 or more years this forest type would evolve into a two-age character. A remnant overstory of sparsely stocked old growth trees mixed with various stocking levels of beech and sweet birch mid stories and or mixtures of fern, grass or striped maple understories.

Wildlife

The diversity of wildlife is dependent upon the diversity of available habitat. Habitat changes result from reforestation/harvest activity, wildlife habitat improvement work, and natural successional patterns and processes. Although there will be differences in the amount and types of habitat by alternative, there will be no significant effects to wildlife populations between the alternatives. Wildlife habitat improvements are proposed in Alternatives 1, 3, and 4 and differ in these alternatives only by the amount of openings created in association with a commercial timber harvest. Under no action, habitat for wildlife that presently utilizes the various watersheds will continue to be available, and populations of local wildlife will be maintained. Over time and through the implementation of the various activities, wildlife distribution and use may shift as preferred habitats either become available or are lost. Based on the analysis in Chapter 3 and the Biological Assessment in Appendix C, the effects to the wildlife resource will be kept below any reasonable level of significance.

Social Environment

Heritage

The East Side Project Area contains a wide variety of heritage resources, both prehistoric and historic, representing thousands of years of human use of the area. Surveys were undertaken in the project area to determine if heritage resources would be adversely affected by the activities proposed. As long as the mitigation measures that are incorporated are followed, there will be no direct or indirect effects to the sites in the project area under any of the proposed alternatives.

Recreation

There are many recreation opportunities within the East Side Project Area, and users can participate in a wide range of experiences within a variety of settings. Road construction, harvesting, and reforestation proposals (such as fencing or herbicide) may cause recreationists to move to other locations. Trail users will be the most affected and inconvenienced recreationists in the project area as some proposed treatment areas include activities on or bordering trails, particularly snowmobile and ATV trails. Alternative 1 proposes the most road activities on trails, followed by Alternatives 4, 2, and 3. Alternative 1 proposes the most harvest in areas containing existing trails, followed by Alternatives 4, 3, and 2.

Visual/Scenic

The landscape, as viewed from travel ways and use areas, is important to people who value aesthetics and are expecting a certain level of scenic quality. Recently, tree mortality has affected the natural appearance of the forest and is most noticeable where there is extensive, catastrophic mortality expanding beyond 40 acres in size. In Alternatives 1 and 3, temporary openings will be created from the harvest and reforestation activities proposed. Such activities are in response to the need to restore forested ecosystems and ensure future forest canopy. Some areas will exceed 40 acres, as allowed by 36 CFR 219.27(d)(2). Where possible, mitigation measures such as buffer zones have been incorporated to meet visual quality objectives. Alternatives 2, 4, and 5 do not result in new temporary openings. In these alternatives, where mortality is heaviest and is either not treated or uneven age management is applied, such areas may appear savanna like and take much longer to become re-forested.

Economic

The actions proposed with this project are designed to help achieve Forest Plan objectives and outcomes. Any time resource management practices are performed, there are direct benefits and costs associated with them. A cash flow comparison was done for each alternative. The purpose of the cash flow analysis was to show the relative difference between alternatives. A review of the data indicates that the differences in cash flow between alternatives are primarily dependent upon the volume of sawtimber harvested, project planning costs, the amount of reforestation work, road costs, and the value of the timber foregone from harvest. Of these, the first two economic variables play the largest role in defining cash flow differences between alternatives.

Alternatives 1 and 3 have the highest cash flows and are positive while Alternatives 2, 4, and 5 have negative cash flows. Alternative 1 has the highest reforestation costs followed closely by Alternative 3. There are no reforestation costs associated with Alternatives 2 and 5 since they both call for letting nature take its course in reforesting the landscape.

Human Health and Safety

Humans use most of the forested areas covered in this analysis. Most of that use is scattered, very intermittent, and of short duration. The risk of falling (live and dead) trees to human safety always exists in a forested setting. For the project areas, overall risks to human safety associated with standing dead trees and falling trees are reduced as the acreage of trees harvested increases. The risk to the public from the actual harvest activity is considered to be low in all action alternatives.

No impacts are expected to water quality for domestic or public water supplies within the project area or near sites proposed for herbicide treatment. Herbicides have been used within the project area since 1987. No adverse effects on human health and safety have been noted. Mitigation measures incorporated within this project, plus additional measures outlined in the Understory Vegetation Management EIS, help ensure that potential effects on human health and safety will be minimal.

Preferred Alternative

The Forest Service's preferred alternative is Alternative 1.

CHAPTER 3 - AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

This Chapter of the EIS describes the environmental components possibly affected by the alternatives and serves as the basis for the comparison of alternatives, long- and short-term trade-offs, cumulative effects, and commitment of resources. The scope of this chapter was determined by 1.) looking at the purpose and need, proposed action, and unresolved issues and 2.) the systems and scale that support the biological, physical, and social elements (resources).

Changes in Analysis Between Draft EIS and Final EIS

A final review of the treatment proposals was made between issuance of the Draft and Final EIS's. This review identified the need to modify 16 stand treatments. Changes in treatments were based upon more recent field reviews than what were available at the time of the completion of the DEIS.

In total, modifications to treatments resulted in minor decreases in the amount of harvest and/or reforestation activity proposed. The primary difference was that fewer acres of regeneration harvest and associated reforestation activities are proposed. Therefore, there are minor differences in the effects of implementing each alternative.

The acres of activity presented in Chapter 2 (Table 4 through Table 20) reflect the modification of treatment proposals. However, the quantitative analysis in Chapter 3 has not been recalculated based upon treatment modifications. Therefore, acres presented in Chapter 2 will be slightly different than those discussed in Chapter 3. Treatment modifications are minor in nature and have a resulting minor impact to effects. Preliminary analysis of the degree of change was made and is available in the project file. Information presented in Chapter 3, with no change in treatment totals, is adequate to display the environmental consequences of each treatment proposal and to display the differences between alternatives.

Organization of Chapter 3

Chapter 3 is separated into three sections: physical, biological, and socio-economic. The *Physical section* discusses ecological land types, watersheds, transportation, and oil-gas-mineral resources; the *Biological section* includes vegetation and wildlife habitat; and the *Socio-economic section* discusses the heritage, recreation, and visual resources as well as the economic and human health and safety factors. In general, the discussion of each resource is organized in the following structure:

- Affected Environment
- Environmental consequences, including direct/indirect effects and cumulative effects
- Summary of mitigation measures and effectiveness

Affected Environment

The description of the affected environment is based upon a list of resources and specific components that may be directly or indirectly affected by the proposed project. The affected environment discussion provides data on the status of resources regarding current composition, structure, and processes that are occurring. This phase of the analysis process helps to determine the complexity required to adequately address effects. The scale in this discussion is limited to the project area (mortality zone) and specific stands or watersheds where harvest activity will potentially occur.

Environmental Consequences

The effects analysis builds on the information presented in the affected environment discussion and discloses the changes from the exiting condition that will likely occur from implementation of each alternative. The depth of analysis is dictated by the specific activities being considered, our monitoring efforts, and our experience in mitigating potential impacts. Some of the environmental consequences have been previously discussed in the Forest Plan FEIS and the FEIS for Understory Vegetation Management. Please see the following for additional discussions:

Recreation Management	USDA-FS 1986: Forest Plan FEIS, p 4-11 to 4-15.
Even-age Silviculture	USDA-FS 1986: Forest Plan FEIS, p 4-17 to 4-24.
Uneven-age Silviculture	USDA-FS 1986: Forest Plan FEIS, p 4-25 to 4-30.
Road Construction, Resurfacing, Management	USDA-FS 1986: Forest Plan FEIS, p 4-30 to 4-37.
Wildlife Habitat Improvements	USDA-FS 1986: Forest Plan FEIS, p 4-42 to 4-46.
Herbicide	USDA-FS 1986: Forest Plan FEIS, p. 4-37 to 4-40 & 4-123 to 4-143. USDA-FS 1986a: Forest Plan Appendix D p. 15 to 22. USDA-FS 1991: Vegetation Management FEIS, Chapter 4; Appendices A, C, E, G. USDA-FS 1989a: Southern Region FEIS for Vegetation. Management, Chapter IV. USDA-FS 1989b: Southern Region FEIS for Vegetation Management, Appendices A, C.

Additional information can also be found within East Side Appendices B (Vegetation Report), C (Biological Assessment), D (Mitigation), and F (Uneven Aged Management).

Two categories of effects are disclosed in environmental consequences: 1.) direct/indirect and 2.) cumulative.

Direct/Indirect Effects

A direct effect is caused by the action which occurs at the same time and place (40 CFR 1508.8). An indirect effect is caused by the action which is later in time or farther removed in distance but is still reasonably foreseeable (40 CFR 1508.8). Direct and Indirect effects take into consideration only the area within the project boundary or specific stands or watersheds where activities are located.

Cumulative Effects

The Council of Environmental Quality (CEQ) defines cumulative effects as ‘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 other actions' (40 CFR 1508.7). Cumulative effects may arise from single or multiple actions and may result in additive or interactive effects.

For each resource, or at times a particular component of a resource, an appropriate scale for analysis was identified. This scale was generated according to when a stable or decreasing influence is established or effects diminish to low levels. The analysis scale for most resources was the project boundary. This boundary represented approximately 168,196 acres[2] and was based upon the zone of mortality. Although size alone is not the most important criteria, this was considered an appropriate scale given the amount of proposed activity level compared to the acreage in the zone of mortality. The time frame of the analysis is 33 years (1986-2019) and represents the reasonable and foreseeable future. Please refer to the project file for additional information. In order to avoid duplication with each section, the following are considered unless noted otherwise in the resource sections:

Past or present projects: Our database housing the history and accomplishments tables was queried for all FS vegetation-related activities that occurred from 1986 through 1999. Also considered were recent supplemental EAs that had stands located within the East Side project boundary that had remaining activities not yet completed but were already approved under NEPA. These included Porter's Prize, Songbird, Deer Fence, Hastings Run, Mother Nature, Beaver Dam, Gladwater, Greely Farm, Derringer, Hoffman Farm, Wolf Run Salvage, Lame Skunk, Eagle Mills, FR165, Carlo, Three Mile, Coon Creek, Mortality I, Turnup Run, Wintergreen, Duck Ponds, Swede Hill, Gumdrop, and Dalmation.

Proposed Projects: Proposed projects are those activities considered within the East Side Project.

Future Projects: Future FS harvest estimates were identified from the amount of activities authorized by the U.S. Fish and Wildlife Service in their calculation of incidental take. These estimates are the same for each alternative. Although each East Side alternative responds to a particular issue and has a unique set of objectives and activity amounts, the presumption made is that future projects would continue to implement the level of activity authorized by the Biological Opinion (USDI–FWS, 1999). While the complete list of projects that are anticipated to occur in the next twenty years is not fully known at this time, the following projects that overlap the East Side project area boundary have been identified and are scheduled for NEPA analysis: County Line, Sugar Run, Kavabuck, Southwest Reservoir, Windthrow Salvage, East Branch, North End, and Chaffee. Based upon these projects, estimations were made regarding the need for future road construction and reforestation activities.

Private Land: Estimates of private harvest activity are based upon research conducted in Pennsylvania in the 1990's which indicates that up to 52% of the non-industrial forest landowners intend to practice some sort of management on their land within the next decade. That management could include harvesting up to 40% of their lands using intermediate stand treatments and up to 12% with even-aged regeneration harvests. Past activities were estimated using the same approach.

Summary of Mitigation Measures and Effectiveness

The final discussion for each resource topic is a summary of the mitigation measures included and the effectiveness of those measures. The effectiveness relies upon previous monitoring efforts, experience and knowledge of resource specialists, or local research. A site-specific stand listing for each measure is found within Appendix D.

[2] This number represents approximately 139,990 acres of Forest Service land and approximately 28,206 acres of private land to total 168,196 acres.

PHYSICAL ENVIRONMENT

Ecological Landtypes

Affected Environment

The National Hierarchical Framework of Ecological Units is a system for stratifying the Earth into progressively smaller areas of increasingly uniform ecological units and potentials. Ecological types are classified and ecological units are mapped based upon associations of those factors (such as climate, physiography, water, soils, air, hydrology, or potential natural communities) that regulate the structure and function of ecosystems. The primary purpose of delineating mapping units at various scales is to identify land and water areas that have similar capabilities and potentials for management. Uses of the hierarchy vary according to management information needs and level of analysis. Table 22 displays the ecological hierarchy for this project. See *Ecological Subregions of the United States: Section Descriptions (USDA-FS 1994)* which describes the broader scale ecological units.

Table 22. Ecological Hierarchy for the East Side Project

Planning and Analysis Scale	Ecological Units	Purpose, Objectives, and general Use	General Size Range
Ecoregion Global Continental Regional	**Domain** *200 Humid Temperate* **Division** *210 Warm Continental* **Province** *212 Laurentian Mixed Forest*	Broad applicability for modeling and sampling. Strategic planning and assessment. International planning.	1,000,000's to 10,000's of square miles
Subregion	**Section** *212G Northern Unglaciated Allegheny Plateau Section* **Subsection** *212Ga High Plateau*	Strategic, multi-forest, statewide and multi-agency analysis and assessment	1,000's to 10's of square miles
Landscape	**Landtype Association** *212Ga2 Wet Mesic to Hydric, Maple-Birch-Beech* *212Ga4 Mesic Beech-Maple-Black Cherry-Hemlock* *LTA 212Ga4e - Mesic Beech-Maple-Black Cherry-Hemlock*	Forest or area-wide planning, and watershed analysis	1,000's to 100's of acres
Land Unit	**Landtype** **Landtype Phase** *See Table 23*	Project and management area planning and analysis	100's to less than 10 acres

Ecological Mapping Units

From an ecoregion perspective, the Allegheny National Forest, and hence this project, is located within the **Northern Unglaciated Plateau Section (212G)**. This section as a whole represents approximately

3,500,000 acres. It is a mature, dissected plateau, that is characterized by broad to sharp ridge-tops and narrow valleys. Elevations range from 1,000 to 2,400 feet, and water drainage is a prominently incised, distinctive, dendritic pattern. The growing season is roughly 120 to 150 days. Northern hardwoods, oak forest types, and Hemlock-Beech-Sugar Maple are the common vegetation types. Tree species commonly found include red maple, sweet birch, black cherry, white ash, yellow birch, eastern white pine, yellow popular, and cucumber tree. Most of the land is forested and is used for recreation, wildlife habitat, hunting, fishing, and production of forest products. Oil and gas production is also a major use. Agriculture is important in the wider valleys and other moderately sloping areas.

The East Side project is located entirely within the **High Plateau Subsection (212Ga)** of the Northern Unglaciated Plateau. This subsection comprises approximately 48 percent of the Section and is characterized by a mature, dissected plateau with elevations ranging from 1,000 to 2,400 feet. One would expect to find similar soil and landform patterns, topography, geology, climate, vegetation, and growing conditions. Soils in the High Plateau are mainly Hazelton, Gilpin, Cookport, Cavode, Ernest-Buchanan, Brinkerton, and Udifluvents. Potentially found within this subsection are Allegheny and Northern Hardwoods, Oak-Hickory-Ash Dry Forests, Sugar Maple-Beech-Hemlock Forests, and Oak-Pine Dry Forests.

Both the Section and Subsection ecological scales paint a broad, general picture of resource capability. At the landscape scale, ecological units are defined by general topography, geology, soil, potential natural community patterns, and local climate. Such ecological units are identified as landtype associations or LTA's; this type of scale best matches with the watershed scale. The East Side Project falls into LTA's 212Ga2, 212Ga4, and 212Ga4e. The following briefly describes these LTA's.

The ***Wet Mesic to Hydric, Maple-Birch-Beech LTA (212Ga2)*** makes up approximately 10 percent of the "High Plateau" subsection and approximately four percent of the East Side Project Area. This LTA is generally below 1,800 feet in elevation and is characterized by level to concave plateaus, benches, and heads of drainage-ways. The soil types are mainly Hazelton, Wharton, Cavode, Brinkerton, and Wayland; and the potential to find wetlands, seeps, or springs is high. There is also a high potential to find components of hemlock, white pine, and cold-deciduous broadleaf trees such as red maple, yellow birch, aspen, and beech.

Making up approximately 25 percent of the subsection is the ***Mesic Beech-Maple-Black Cherry-Hemlock LTA (*212Ga4)**. This LTA is found on approximately 49 percent of the project area. While generally below 1800 feet in elevation, this LTA contains wide, gently sloping plateaus and sloping to steep side slopes. Hazelton, Cookport, Ernest, Buchanan, and Udifluvents are the main soil types. Cold-deciduous broadleaf trees such as red maple, yellow birch, beech, and black cherry are potentially found within this LTA. A high component of hemlock with some white pine can also be found.

The ***Mesic Beech-Maple-Black Cherry-Hemlock LTA (212Ga4e)*** makes up approximately 21 percent of the subsection and approximately 47 percent of the project area. This LTA is characteristic of the 212Ga4 LTA except for elevation. This LTA is generally found above 1,800 feet in elevation. Above this elevation, soils may be cold enough in the soil profile to be classified as "frigid".

Finally, the basic mapping unit for a project such as East Side is the Ecological Landtype phase (ELTP). Please refer to Table 23. These mapping units are soils based and are based on more narrowly defined criteria such as soil drainage, slope, position on the landscape, relationship to streams, or landform. These factors influence or reflect the microclimate, productivity, and manageability of a site. These mapping units are also the best representations of topography and landforms and can be used to characterize the physical environment of the project area. In understanding the symbol key, the first two capital letters describe either a slope or position on the landscape; the number refers to the Soil Group 1, 2, or 3; and the small letter that follows refers to some qualifier describing the soil characteristics. Eighty percent of the mapping unit is as defined. Units may also have small inclusions of different soils, soil

drainages, slopes, and landforms. Modification of ELTPs is expected as more is learned about the physical and biological components of ELTPs. Associated plant and wildlife communities are also being developed as mapping units are validated.

ELTPs to Describe Soils

In 1992, the ANF started a process to implement the national "Ecological Classification, Inventory, and Monitoring" program. This is a more comprehensive approach to land management than just using soil mapping units. Ecological mapping units may utilize such criteria as position on the landscape, landform, aspect, vegetation (tree, shrub, and herbaceous layers), slope percent, elevation, geology, relationship to streams, surface rocks, and soils (soil classification, internal soil drainage, soil depth, root restricting layers, texture, and humus layers). In the Forest Plan, Soil Groups were utilized to represent internal soil drainage. Internal soil drainage is the major factor in equipment operability. Each ELTP has a number in its name. This number represents the Forest Plan Soil Group and thus, still represent Forest Plan direction.

In the Forest Plan, soils are grouped according to internal soil drainage characteristics: Soil Group 1-well drained, Soil Group 2-moderately drained, and Soil Group 3-poorly drained. Table 23 briefly describes some common characteristics of the various ELTPs, including a soil group classification. Approximately 50% of the East Side project area is covered by Group 2 soils, which are moderately-well drained. Approximately 7% of the soils within the project area are Group 3, which are poorly drained. The remainder (43%) is Group 1, well drained. In the project file is the “Ecological Landtype Mapping Unit Legend” (April 26, 1996). This legend defines each landtype with the soils that are in each landtype. These soils are then described in “Soil Survey for McKean County, PA (USDA-NRCS 1987), and Elk and Cameron County, PA (USDA-NRCS 1993); both are published by the USDA Natural Resource Conservation Service.

ELTPs to Identify Riparian Areas

Riparian areas are those ecosystems that are strongly influenced by water, occurring as transition areas between aquatic and terrestrial ecosystems and include wetlands. The size of a riparian area varies. The boundaries of riparian areas extend outward and parallel to stream channels or lake shores; upward into the canopy of stream-side vegetation; and downward into the soil (USDA-FS 1998c).

ELTPs can be used to identify riparian areas. Some riparian areas (ELTPs) were mapped using actual alluvial flood plain soils (soil mapping units); others were mapped by utilizing computer model mapping. Please refer to the project file for more information. The Upper Bottom and Floodplain landforms are generally considered riparian areas. Depression ELTPs may also be riparian areas if they have wetlands or have wetland inclusions. Using the acreages found in Table 23, the East Side project area has approximately 12,835 acres (9% of the project area) of riparian areas.

It is recognized that other riparian vegetation also exists in association with wetlands and seeps. Seeps are generally found in association with FS2, FS2s, SS1LS, SS1LSs, and SS1 landtypes on middle or low slopes. Seeps exit the soil in these landtypes and flow into streams. Wetlands can be found anywhere on the landscape. Although they are mainly associated with DS3sw, DS3w, FP3, GS3, MS3s, UB3sw, and UB3w ELTPs, wetlands may be inclusions within GS2, GS2a MS2a, UB2c and UB2sc ELTPs. Potential wetlands have to be examined on the ground to determine if they meet the hydric soils, hydrology, and hydrophytic vegetation requirements to be classified as a wetland.

Table 23. ELTp And Landforms: Distribution By Project Area And Proposed Treatment Areas
Please Refer To The ELTP Symbol Key Below

Landform	ELTP	Description	Stony or Very Stony	Soil Group I Well Drained	Soil Group II Moderately Well Drained	Soil Group III Poorly Drained	Used to Map Riparian	Wetlands Possible	Wetland Inclusions	Seeps	Acres within Project Area (Only federal land)	Percent of Project Area	Percent where harvest activity could occur
Depression	DS3sw	Depression/swale	Y			Y		Y		Y	1,215	<1%	<1%
Depression	DS3w	Depression/swale				Y		Y		Y	1,726	1%	<2%
Flood Plain	FP1	Floodplain		Y			Y				27	<.01%	0%
Flood Plain	FP2	Floodplain			Y		Y		Y		1,905	1.4%	0%
Flood Plain	FP3	Very deep; floodplain				Y	Y	Y			1,252	<.09%	<1%
Footslope	FS2	Low slope			Y				Y	Y	1,421	1%	<1%
Footslope	FS2s	Low slope	Y		Y				Y	Y	13,394	10%	5%
Gentle Slope	GS1	Plateau And Upper Side slopes		Y							430	<1%	2%
Gentle Slope	GS1LS	Plateau And Upper Side slopes		Y							9,377	7%	7%
Gentle Slope	GSILSs	Plateau And Upper Side slopes	Y	Y							3,576	3%	4%
Gentle Slope	GS1s	Plateau and Upper Side slopes	Y	Y							372	<1%	0%
Gentle Slope	GS2	Plateau top			Y				Y		19,572	14%	22%
Gentle Slope	GS2a	Plateau top			Y				Y		2,813	2%	4%
Gentle Slope	GS2fs	Low slope	Y		Y					Y	3,391	2%	<1%
Gentle Slope	GS2s	Plateau top	Y		Y						17,095	12%	17%
Gentle Slope	GS3	Plateau and benches				Y		Y		Y	1,639	1%	1%
Gentle Slope	GS3s	Flat to concave Plateau	Y			Y			Y		162	<1%	0%
Mined Land	MDL	Land that has been mined.			Y						3	<1%	0%
Moderate Slope	MS1LS	15-25% upper slope	Y	Y							2,633	2%	2%
Moderate Slope	MS1LSs	15-25% upper slopes	Y	Y							12,147	9%	10%
Moderate Slope	MS2a	15-25% upper slopes			Y				Y		170	<1%	<1%
Moderate Slope	MS2s	15-25% upper slopes	Y		Y						5,100	4%	3%
Moderate Slope	MS3s	8-25% upper slopes	Y			Y		Y		Y	640	<1%	<1%
Depression	MU	Organic soil				Y	Y	Y			2	<1%	0%
Shoulder/crest	SH1	Narrow plateau crest	Y	Y							6,037	4%	5%
Steep Slope	SS1	Steep 26-40%; side slopes	Y	Y						Y	912	<1%	<1%
Steep Slope	SS1LSs	Steep 26-40%; side slopes	Y	Y						Y	22,786	16%	14%

Landform	ELTP	Description	Stony or Very Stony	Soil Group I Well Drained	Soil Group II Moderately Well Drained	Soil Group III Poorly Drained	Used to Map Riparian	Wetlands Possible	Wetland Inclusions	Seeps	Acres within Project Area (Only federal land)	Percent of Project Area	Percent where harvest activity could occur
Very Steep Slope	SSV1S	Very Steep 41-60% side slopes		Y							141	<1%	0%
Very Steep Slope	SSV1Ss	Very steep 41-60% side slopes	Y	Y							297	<1%	<1%
Terrace	T2	River terrace, nearly level			Y		Y				48	<.01%	0%
Terrace	T3	River terrace, nearly level				Y	Y	Y			6	<.01%	0%
Upper Bottom	UB1sc	Complex mix soils/drainage; "V"shaped valley^	Y	Y			Y				826	<.6%	<1%
Upper Bottom	UB2c	Complex mix soils/drainage; "U"shaped valley^			Y		Y		Y	Y	1,697	1.2%	<1%
Upper Bottom	UB2sc	Complex mix soils/drainage; "U"shaped valley^	Y		Y		Y		Y	Y	3,600	2.6%	1%
Upper Bottom	UB3sw	"U"shaped valley	Y			Y	Y	Y		Y	2,012	1.4%	<1%
Upper Bottom	UB3w	"U"shaped valley				Y	Y	Y		Y	1,460	1%	<1%
VerySteep Slope	VS1LSs	Very steep, 61% + side slopes	Y	Y							4	<1%	0%
		Water or Unclassified									103	<1%	0%
		Total ELTP Acres	96,199	59,565	70,209	10,114	12,835	9,952	44,734	55,893	139,990		

ELTP Symbol Summary (example, GS2s = gentle slope plateau, moderately well drained, stony)

Topographic Position

DS = Depression/swale/bench/head of drainage
FP = Flood plain
FS = Foot slope (3-15% slope)
GS = Gentle slope (2-15% slope)
MS = Moderate Slope (15-25%)
SH = Shoulder/crest
SS = Steep Slope (26-40% slope)
SSV = Very Steep Slope (41-60% slope)
UB = Upper Bottom (valley drainages, 1-8% slope)

Soil Drainage (Soil Groups)

1 = well drained
2 = moderately well drained
3 = poorly drained

^ = *udifluvent -soil complex*

Soil Characteristics

LS = loamy skeletal
s = stony
c = soil complex
w = wet
f = foot slope

Environmental Consequences

Direct/Indirect Effects

Using GIS, the various ELTPs were overlain with maps of proposed activities to help identify where the proposed activities lay in relation to the areas that potentially contain more sensitive soils in terms of drainage, slope, or riparian areas. Table 23 and Table 24 are the result of that process and identify the percent landforms and individual ELTPs affected by timber harvest activities for the action alternatives. It should be noted that while this process is a useful tool, soil maps are based on generalized information and locations are not exact. They may display more or less acres in a sensitive area than are actually present on the ground. Field verification has been used to avoid sensitive areas by modifying treatment unit boundaries, by incorporating such areas as "out areas", or in places where avoidance is not possible, to ensure that the appropriate mitigation measures are implemented on areas that actually contain Group 3 soils. If necessary, additional adjustments or additional mitigations could be applied prior to harvest or during contract administration.

Table 24. Summary of Landforms--Percent Affected by Timber Harvest by Alternative
Numbers in ( ) denote total harvest acres

ELTP/Landform	Common Physiographic Feature	Alt. 1 (8,223 ac)	Alt. 2 (4,220 ac)	Alt. 3 (5,810 ac)	Alt. 4 (5,966 ac)	Alt. 5 No Action
Affected Landform						
Floodplain	Alluvial soil, riparian habitat	<1	0	0	0	0
Upper Bottom	"V"/"U" valley bottom drainage, riparian	2	<2	<2	<2	0
Depression	Flat to concave, very poorly drained, riparian	<2	1	<1	1	0
Footslope	Low slopes ranging from 3 to 25% slopes	<6	5	6	5	0
Steep Slopes	Slopes ranging from 26 to 40%	14	12	15	16	0
Moderate Slopes	Slopes ranging from 15 to 25%	15	13	17	15	0
Shoulder	Crest slopes ranging 3 to 15%	5	5	5	6	0
Gentle Slopes	Slopes ranging from 1 to 15%	56	62	55	55	0
Soil Drainage Class						
Well Drained	No internal drainage problems	43	42	46	47	0
Moderately well	Restrictive fragipan or texture horizon	53	54	52	50	0
Poorly Drained	Restrictive soil horizons - high water table	4	4	2	3	0

Soil surface disturbance is one effect of the activities proposed. Soil surface disturbance includes compaction, soil displacement, rutting, puddling, and erosion. It also includes a loss of landform from road construction and rock pit excavation. Soil surface disturbance is important because it has an impact on soil quality, maintenance, and sustainability. This disturbance occurs primarily on and along skid trails and landings. Standards and Guidelines contained in the Forest Plan are designed to minimize the amount of soil disturbance from management activities. The standard compliance is to confine the area covered by harvesting operations to 15 percent or less of the individual harvest unit (USDA-FS 1986a), including all activities that occur within that harvest unit (McNabb 1983+). For activities that require a second entry, new trees are harvested in previously undisturbed areas. In total, the existing skid trails and newly disturbed areas should still be under 15 percent.

Nutrient cycling is the circulation of chemical elements, such as nitrogen, in specific pathways from the abiotic parts of the environment into organic substances (plants and animals), and then back again into abiotic forms (Manley et al 1995a). The cycling of nutrients is a constant process. The nutrient cycle is affected by how much biomass is harvested, how it is harvested, how often it is harvested, and how quickly the site has an increase in growing biomass. This analysis is concerned with two nutrient cycling processes: carbon and nitrate.

Carbon Cycle

As trees grow, they take up carbon dioxide from the atmosphere and store it in biomass. While carbon storage relates to a "snapshot" view of how much carbon is stored in the forest now, carbon sequestation refers to the process of carbon dioxide intake into plant tissues. For any given management alternative, short-and long-term results will often be quite different. The most useful way to compare alternatives is to employ the concept of average annual yield. While an old forest will, at a point in time, contain more carbon than a young forest, the *rate* of carbon storage will either be very low, zero, or even negative. This is because while trees take up carbon dioxide, they also release it through the process of respiration. As trees age, their net carbon storage decreases as respiration equals or exceeds production. Over a long-term view, younger, rapidly growing forests, while actually containing less carbon at a point in time, are removing carbon from the atmosphere and storing it at a faster rate than an older forest.

Management simulations based on actual inventory data from the Southeastern United States (Hoover et al. 2000) indicate that the carbon consequences of forest management actions depend strongly on initial forest conditions, especially age class distribution, forest composition, and stocking level. In general, a mixture of older trees with high current carbon storage and younger trees with rapid carbon accumulation rates will provide the best opportunities for maximizing the carbon storage potential of a forest. It is also desirable to maintain stands in a well-stocked state and ensure successful regeneration so that the carbon storage potential of a site is fully realized.

Carbon harvested from the forest is transferred into products, many of which are long lived. Some harvested carbon is sent to landfills where decay is slow and some is burned for energy. While burning of biomass releases carbon dioxide into the atmosphere, it prevents fossil fuels from being burned, and so can result in a net carbon savings. Logging debris while still representing a pool of stored carbon over the short-term, over the long-term would decompose, thus, releasing carbon dioxide into the atmosphere.

Nitrate Cycle

Interactions between forest disturbances, wet atmospheric deposition of nitrates, soil nitrate availability, and potential impacts to forest health are also important considerations when evaluating alternatives. For as long as records have been maintained (since 1982), the region which includes the ANF has received heavy inputs of nitrate through wet deposition (for additional info, see Appendix B, p. 5 item 3). There is also the potential for forest disturbances (logging activity, fires, insect defoliation, substantial tree mortality, etc.) to increase on-site nitrate concentrations to unacceptable levels resulting in unacceptable off-site movement of nitrates.

Given the activities associated with the East Side project and local evidence, we do not believe that nitrate concentrations will move towards unacceptable levels or unacceptable off-site movement of nitrates for the following reasons:

- There is no local evidence that soil nitrogen levels are close to approaching saturation. Observation of growth results from one application of nitrate fertilizer to regenerating forest stands indicates nitrogen demanding species such as black cherry and pin cherry respond with significant increases in stem height growth. Present nitrogen levels are low enough to limit tree growth on many sites.

- On sites in the Northeast where the majority of the large overstory trees have been harvested, nitrogen demanding species (pin cherry and black cherry) with shallow roots are positioned to take up excess nitrogen with minimal losses off-site (Marks 1974, pp 83-84).

- Full site occupancy with vegetation of any species serves to reduce off-site movement. Shelterwood removals, which by nature contain numerous well-rooted tree seedlings, help to further minimize this effect. Locally, areas which have been shelterwood seed cut and have herbaceous vegetation and well-rooted tree seedlings have demonstrated little movement of nitrate nitrogen below one foot depth in the soil profile (Horsley, personal communication).

- Reforestation practices commonly used on the ANF (fertilization, fencing, herbicide treatment, etc.) further assist in establishing the kinds of vegetation that limit off-site movement of nitrogen.

- Water samples collected from streams near regenerating stands which had been fertilized did not reflect elevated levels of nitrate nitrogen in the water (Auchmoody and Steele,1974).

- Forest Plan standards and guidelines limit ground disturbance to less than 15% of the timber sale area (USDA-FS 1986a, Chapter 4 p 22) and operating restrictions (USDA-FS 1986a, Chapter 4 pp 22 and 23) will help keep 85% of the forest floor intact, allowing soil processes to continue functioning.

With this project, small movements of nitrates are potentially possible based upon stocking with forest cover and the ability of the forest floor to remain fully functional.

Tied to both soil disturbance and nutrient cycling is **soil productivity**. Soil productivity (or quality) refers to the capacity of soil to function within an ecosystem in order to sustain biological productivity, maintain environmental quality, and promote plant and animal health. Changes in soil properties and loss of nutrients can affect long-term soil productivity, depending upon the type of disturbance and recovery capacity of the soil. Productivity is lost as a result of a loss of growing medium from rock pit excavation and long-term, but still retrievable, loss through road placements.

No Action Alternative

Under no action, there would be no harvest proposals, no additional stone pit development or expansion, nor any road construction activities associated with the East Side project area. Therefore, there would be little change in the productivity of the land with no new management activities taking place in Alternative 5. Landtypes would be impacted by the regular recurring maintenance and use of roads, dispersed campsites, and trail systems. Soil movement may continue to occur in areas susceptible to erosion. Natural processes and functions of nutrient recycling would occur as the dead material decomposes. Actual soil organic matter may increase with an accompanying increase in soil microorganisms and fungi. Since there is no harvest, no carbon would be removed from the forest. Dead and dying trees would decay with carbon released to the atmosphere (Please refer to Table 25). Due to interfering vegetation, lack of advance regeneration, and high deer browsing pressure, stocking levels are projected to decline, since overstory trees will not be replaced by similar trees when lost. Due to growth habits, striped maple and beech thickets have low carbon sequestration potential. The effect of implementing this alternative is that 71% of the treatment areas would have relative densities (stocking) greater than 60%, thus providing low carbon storage potential which is similar to Alternatives 2 and 4.

Action Alternatives

The direct and indirect effects of the action alternatives on soils tends to be similar, varying by the amount of activity that would take place with each alternative. Any proposed harvesting on the ANF and with this project (Alternatives 1 through 4) would be by stem removal only. This method leaves the nutrient rich branches and leaves to be re-cycled. No unmerchantable, dead and/or down material will be removed from the site. Table 26 identifies the soil acres that harvesting activities would occur on.

All action alternatives would remove carbon from the forest by harvesting. The differences between alternatives lie in the type of harvest activity (salvaging dead or dying trees versus live/healthy trees), the volume removed, remaining stocking levels, and whether or not reforestation measures would be utilized. Alternatives 1 and 3 would remove a large amount of carbon from the forest; much of this would be from salvage. Carbon would also be removed from the forest in the form of live healthy trees. Dead and dying trees not harvested would be least abundant in Alternative 1. Harvest amounts would be smaller in Alternative 3 than in Alternative 1. The carbon outcome will depend on the final product mix, but a small loss of carbon stored onsite is likely. These alternatives include regeneration activities, including those projected to improve stocking and ensure seedling establishment, both critical factors in maintaining the carbon storage potential of forests. The Vegetation Section under the Biological Environment in this document provides more detail regarding the projected outcomes for stocking levels. In the long term, the effect of proposed harvesting and reforestation activities would maintain 93% of the treatment areas in Alternative 1 and 91% of the areas in Alternative 3 with stocking levels greater than 60%, indicating an increase in the carbon stored. (Please refer to Table 25).

Table 25. Potential Short and Long Term Carbon Consequences; Resulting Percentage of Treatments with Densities Greater than 60%; and Total Harvest Volumes

	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
Short Term Carbon Consequences	Small magnitude carbon loss	Range from slight carbon loss to slight carbon gain	Small magnitude carbon loss	Range from slight carbon loss to slight carbon gain	No change in carbon storage
Long Term Carbon Consequences	Carbon gain and increase in carbon storage potential	Loss of stored carbon and reduction in carbon storage potential	Increase in stored carbon and carbon storage potential	Stored carbon will decrease and carbon storage capacity will decline	Decline in both stored carbon and carbon storage potential
Relative Density Greater than 60%[3]	93% of the Proposed Treatments	71% of the Proposed Treatments	91% of the Proposed Treatments	71% of the Proposed Treatments	71% of the Proposed Treatments
Total Harvest Volume (MBF)[4]	64,199	5,675	42,710	12,494	0

Alternative 2 would also remove carbon from the forest, but only through salvage cutting of dead/dying trees. Depending on the utilization of the salvaged material, the net result could vary from a slight decrease to a slight increase in carbon storage. No regeneration activity is planned under this alternative. Due to interfering vegetation, deer browsing, and scarcity of adequate advance regeneration, only 71% of the treatment area is expected to attain stocking levels greater than 60% since many overstory trees would not be replaced, or would be replaced by beech or striped maple thickets with low carbon holding capacity. Carbon storage would be lower than Alternatives 1 or 3 but similar to Alternatives 4 and 5.

[3] Information adapted from the "Alternative Treatment Area Stocking Outcomes in Year 2019" Table within the Vegetation section of this document.
[4] Information adapted from the "Summary of Key Economic Values" Table within the Economic Section of this document

Alternative 4 would remove carbon mostly in the form of salvaged dead/dying trees as well as live healthy trees, thus removing some carbon from the debris pool, where it would decay, and transferring it to products, landfills, and biomass energy. Regeneration activities are planned, and are centered on uneven-aged management, which does not have a history of success on the Allegheny. In the long term, the effect of proposed harvesting and reforestation activities would maintain 71% of the treatment areas with stocking levels greater than 60%. Carbon storage in this Alternative would be similar to Alternatives 2 and 5.

Harvesting activity directly affects soil productivity and sustainability by compacting soil, accelerating erosion, and displacing organic matter. Table 26 identifies the potential soil disturbance under each of the alternatives after multiple harvest prescriptions are implemented. As stated above, the Standard and Guideline contained in the Forest Plan is to confine the area covered by harvesting operations to 15 percent or less of the individual harvest unit. By meeting this standard, the area of soil disturbance also has minimum overall impact on the humus layer and results in minimum impact to nutrient cycling. For the action alternatives, the potential soil disturbance ranges from Alternative 1, having an estimated 1,197 acres of potential disturbance to Alternative 2, [which only considers salvage harvesting] having potentially 633 acres of soil disturbance. For Alternatives 1 and 3, those stands prescribed with a shelterwood seed cut would require a second entry harvest within 3-10 years later. Following the removal cut, logging equipment would not be used in the stands for approximately 50 years. Stands receiving a selection harvest (Alternatives 1, 3, and 4) would not be operated in again for 15-20 years. Additional harvesting would mean additional soil compaction and disturbance. Where two treatments occur within a 10 year period, the main skid trails are used again so recovery is prolonged, but the impact is not doubled. The soils in these stands are expected to recover naturally, within 15 years of the last activity proposed.

To some degree, soil compaction occurs in every stand that is harvested. All landtypes are susceptible to compaction, but moderately well drained (with perched water tables) and poorly drained landtypes (high water tables) are more vulnerable (Oregon State Un 1983; Brais and Camire 1997; Stuart and Carr 1991; Thompson et al 1997). On the ANF, moderately well drained and poorly drained landtypes correspond to Group 2 and 3 soils in the Forest Plan. Approximately 57% of the harvest units are potentially found on landtypes that are considered moderately well and poorly drained sites under Alternative 1; 58% under Alternative 2; 54% under Alternative 3; and 53% under Alternative 4. Potential effects of heavy equipment on moderately well and/or poorly drained landtypes will be mitigated by requiring seasonal operation restrictions and/or the use of low ground pressure skidding equipment.

For riparian areas, 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 (USDA-FS 1986a, p4-19). Stands that have riparian areas will be managed to maintain and enhance riparian dependant values. This includes a non-disturbance area sufficient to sustain these dependant values and the microclimate. Similar computer mapping was used to determine where harvest activities potentially overlap riparian areas. In all action alternatives, these areas represent approximately three percent or less of the proposed harvest areas. None of the timber harvest treatments or herbicide treatments would occur in areas with standing water and wetland plants nor on the immediate streambank. Timber sale administrators would monitor harvest operations to ensure that sensitive soils and riparian habitats are properly protected.

Alternatives 1, 3, and 4 propose Glyphosate and Sulfometuron methyl herbicide application and would occur on Soil Groups 1, 2, and 3. For a discussion of the effects of herbicide use on soils, refer to the FEIS for Vegetation Management, Chapter 4 (USDA-FS 1991). No effects other than those described in the FEIS are anticipated to occur.

In Alternatives 1 and 3, fertilizer is proposed. Fertilizer gives the seedlings a quick growth spurt so they can out-compete browsing deer and encourages rapid plant growth to protect areas that need re-vegetation for erosion control purposes. The environmental effects of fertilization are described on pages 4-41, 4-42, and 4-129 of the FEIS Land and Resource Plan, Allegheny National Forest (USDA-FS 1986). This

activity helps re-vegetate the site and thus helps retain nutrients on site.

The application of fertilizer and herbicide are considered surface disturbing activities when wheeled/tracked equipment is used to spread fertilizer and spray herbicides. Herbicide and fertilization activities result in one pass over an area and therefore, surface disturbance results on approximately 7 percent of an acre. When fencing is installed, some slight leveling by equipment at the base of the fence may be required. This may result in ½-acre disturbance for 1 mile of fence construction. Under Alternative 1, an estimated 337 acres of surface disturbance may occur when herbicide and fertilizer are applied by wheeled/tracked equipment. When fencing is installed, 29 acres may be disturbed. The same relationship can be derived for the other alternatives using Table 26. Alternative 2, which considers only salvage harvesting, proposes no reforestation activities. Alternatives 1, 3, and 4 result in potential disturbance from reforestation activities on approximately 0.2% of the project area.

Obtaining rapid regeneration and revegetation after harvesting is important as this growing biomass retains nutrients on the site. As stated above, the use of fertilizer is proposed in Alternatives 1 and 3. Where specific rotation ages, species, and management area objectives allow, the "ecological rotation" age is approximately 70 to 90 years. This is based upon the recovery time of the forest floor. Each species has its own life period and thus these plants utilize available nutrients over this time period.

There are differences between the alternatives in the potential for off-site movement of nitrates or for accelerated soil cation loss. Those differences relate to the potential for the forest floor to remain fully functional and to the potential for the site to be moderately to well stocked with forest cover. Stand stocking is an indicator of tree root system abundance and functionality which are important in limiting nitrate accumulation. Stands with lower tree stocking are more subject to soil heating, more organic loss through decomposition of the forest floor, a lower nitrogen uptake, and the potential for higher off-site nitrate nitrogen loss as the forest floor degrades.

Over the short-term, Alternatives 1 and 3 with higher rates of harvest activity would have higher potential for off-site movement of nitrate nitrogen or soil cation loss. However over the long term, the effect of harvesting and the higher levels of reforestation activities prescribed in Alternatives 1 and 3 are expected to produce much higher tree stocking and a much more functional forest floor than result in Alternatives 2, 4, or 5. In the long term, management prescribed in Alternatives 1 and 3 is expected to result in 91% to 93% of the stands having >60% stocking, while in Alternatives 2, 4, or 5 only 71% of the sites are expected to have tree stocking >60%.

All landings and skid trails with slopes greater than 15 percent would be seeded with a wildlife seed mix immediately following harvest. This revegetates and stabilizes disturbed areas, which are most likely to result in off-site soil movement. Based on observations of past timber harvest sites in the area, unseeded skid trails are expected to revegetate naturally within two growing seasons. Areas on relatively flat ground, which are disturbed, but not seeded, have minimal off-site erosion. For those areas needing seeding late in the growing season, 30 lbs of certified winter wheat seed per acre will stabilize the site until native plants regenerate on the site.

Soils would also be impacted by the maintenance and use of roads and trail systems. Soil disturbance would occur in areas having road reconstruction (betterment), restoration, or new construction. Soil productivity would decrease on those areas having new road construction. Road decommissioning initially would cause some soil displacement but overall, as these areas re-vegetate, they become less prone to erosion and return acres to vegetation production.

When considering the use of long skids or road construction activities, each has a different set of effects regarding productivity. Table 26 indicates the amount of potential disturbance associated with each activity in each of the action alternatives. Tied to the type of activity is the Traffic Service Level design of each road having construction activity. Transportation Traffic Service Levels (TSL) describe the characteristics and operating conditions for a particular road. East Side has two levels: TSL D, which are

considered local roads, generally closed to the public and TSL C, which are collector roads and are generally open to the public. Surface material would either be pit run or limestone. The difference between the two TSLs lies in the state of the running surface following use. For TSL C, the running surface would be maintained in a non-vegetated state. For TSL D, following use, the running surface may be seeded to a wildlife/grass mixture or left to seed in naturally. Please refer to the Transportation Section in this document for more information. Plants used for all road and "long skids" re-vegetation will be native to Pennsylvania and/or if introduced species (i.e. red clover), have a history of being non-invasive.

Alternatives 1, 2, and 4 propose new road construction and road re-alignment. For new road construction a width of approximately 31 feet would lose its vegetation for that road mileage amount. During use, approximately 18 feet of this would eventually have some sort of grass/forage and/or other shrubs/regeneration growing on it. The remaining 13 feet would be the running surface. *Road Realignment* has the same impacts as new construction. Where cuts and fills are needed, landforms will be altered, soil sustainability, and internal and surface drainage may be changed. For Alternatives 1, 2, and 4, approximately 63, 35, and 42 acres respectively would be affected by these activities.

Only Alternatives 1, 2, and 4 propose road betterment. Road Betterment has the most variability in the amount of vegetation that may be removed. It can vary from 0 feet in some areas of betterment to 20 feet. An average of 10 feet is typically used. This vegetation is removed and eventually replaced with grass or small shrubs/regeneration for approximately 6-8 feet with the remainder becoming part of the running surface. Where cuts and fills are needed, landforms will be altered, soil sustainability, and internal and surface drainage may be changed. Betterment mainly occurs on existing road corridors. For Alternatives 1, 2, and 4, approximately 19, 11, and 5 acres respectively would be affected by these activities.

All four action alternative propose a level of road restoration. Road Restoration typically involves only sporadic vegetation removal (additional turnouts, remove hazard trees, etc.). Turnouts require 15 feet additional vegetation removal for 50 feet and tapers to the existing clearing at each end. Approximately 5 feet of this area would eventually have grass or other small shrubs/regeneration growing on it, with the remaining 10 feet being the running surface.

Alternative 3 utilizes long skids (over 1/2 mile) and/or temporary roads rather than new construction. Long skids and/or temporary roads have similar impacts as new construction. The main differences being that the long skid/temporary road corridors are more narrow and they are returned to vegetation sooner. Long skids are typically longer than 1/2 mile, approximately 15 feet wide, and will have more traffic than inside cutting unit skid trails. Long skids may have some spot stoning where needed, but essentially will be non-vegetated after use because of compaction, some rutting, and puddling. These "long skids" will not be restored to normal landform contour. However, they will be fertilized, limed, and seeded, as needed. Where concentrated skidding traffic exists, landforms may be altered, soil sustainability, and internal and surface drainage may be changed. There may be 3.5 miles of "long skids" and/or temporary roads, which may result in 6.3 acres of lost vegetation production.

Soil loss, displacement, and disturbance would occur through the development of stone pits. When stone pits are developed, "pit-run" rock material is removed for road base construction material. Excavation and site impact for new pits is approximately 1.5 acres per pit. The expansion of existing pits will result in an additional impact of 0.75 acres per pit. The average depth of a pit excavation is approximately five feet. The overburden (topsoil) and large rocks are stockpiled in separate, pre-designated places for site restoration. In general, only one working face is available for extraction. As the rock source is depleted, that portion of the pit can be restored. When the site is restored, about 60 percent of the site has irreversible and irretrievably been lost to future forest regeneration and 100 percent of the site has a loss of natural landform and drainage.

Table 26. East Side Activities and Acres of Potential Surface Disturbance

Disturbance Activity	*Alt. 1*	*Alt. 2*	*Alt. 3*	*Alt.4*	*Alt.5*
Harvest Acres	7,978	4,220	5,322	5,345	0
Potential Disturbance Acres (# acres X 0.15) =	**1,197**	**633**	**798**	**802**	**0**
Fencing Acres	2,314	0	1,977	947	0
Potential Disturbance Acres ([# acres ¸ 40'] X 0.5) =	**29**	**0**	**25**	**12**	**0**
Herbicide Acres	3487	0	3,005	2,752	0
Potential Disturbance Acres (# acres X 0.07) =	**244**	**0**	**210**	**193**	**0**
Fertilization Acres	1,322	0	1,103	0	0
Potential Disturbance Acres (# acres X 0.07) =	**93**	**0**	**77**	**0**	**0**
Miles of New Road Construction	15.3	8.3	0.0	10	0
Potential Disturbance Acres ([# miles X 5280'] X 31 ¸ 43560') =	**57.5**	**31.2**	**0.0**	**37.6**	**0**
Miles Re-alignment	1.5	0.9	0.0	1.1	0
Potential Disturbance Acres ([# miles X 5280'] X 31' ¸ 43560) =	**5.6**	**3.4**	**0.0**	**4.1**	**0**
Road Betterment	16	9.4	0.0	4.2	0
Potential Disturbance Acres ([# miles x 5280'] X 10 ¸ 43560) =	**19.4**	**11.4**	**0.0**	**5.1**	**0**
Miles of Road Restoration	92	80.6	86.7	87.1	0
Potential Disturbance Acres (# miles X .2 ac) =	**18.4**	**16.1**	**17.3**	**17.4**	**0**
Miles of Road Decommissioning	**7.2**	**5.2**	**2.0**	**5.2**	**0**
Potential Restoration Acres (# miles X 4.3 ac) =	**31**	**22.4**	**8.6**	**22.4**	**0**
Miles of Long Skid	0	0	3.5	0	0
Potential Disturbance Acres (# miles X 1.8 ac) =	**0**	**0**	**6.3**	**0**	**0**
# New Rock Pit Development	10	8	7	10	0
Potential Disturbance Acres (# pits X 1.5 ac) =	**15**	**12**	**10.5**	**15**	**0**
# Rock Pit Expansion	33	28	26	33	0
Potential Disturbance Acres (# pits X 0.75 ac) =	**24.75**	**21**	**19.5**	**24.75**	**0**
Total Potential Soil Disturbance Acres	**1,735**	**751**	**1,172**	**1,133**	**0**

Table 26 also identifies the number of new pits proposed to be developed as well as the number proposed to be expanded with each alternative. All rock material pit proposals will have a pit development and restoration plan. The amount of stone pits needed varies with road construction activities. Alternative 3, which has no new construction and no new betterment activities, would require the expansion of 26 existing pits and development of 7 new pits. Alternative 2 only has salvage harvest and requires less transportation activities, but still requires 8 new pits and expansion of 28. Both Alternative 1 and 4 propose new construction, reconstruction, requiring more pit development of 10 new pits and 33 expanded pits per Alternatives 1 and 4. The surface disturbance and loss of productivity is therefore higher with these alternatives.

Cumulative Effects

Cumulative effects to the soil (landform/landtype) resource will be evaluated by looking at the past, present and foreseeable effects associated with human-caused disturbances associated with timber harvest, road construction, oil and gas development, and rock material pit development. The scale in this assessment is the area within the East Side project boundary within a thirty-three year period. Please refer to the beginning paragraphs of Chapter 3 for further explanation. The base for cumulative effects is the "No Action" alternative. Table 26 identified the formulas used in calculating the potential disturbance acres found in Table 27. Cumulative numbers represent past, present, and future FS activities as well as activities that occur on private land when known.

Table 27 identifies the cumulative impact for each of the alternatives in terms of potential disturbance acres. For harvesting, Alternative 1 could cumulatively have 64,330 acres of activity when all management plans are implemented with approximately 9,650 acres of potential soil disturbance. The same can be derived for the other alternatives: 2 - 59,696 harvest acres with potential for soil disturbance of 8,954 acres; 3 – 61,863 harvest acres with a potential for soil disturbance of 9,279 acres; and 4 – 61,544 harvest acres with a potential for soil disturbance of 9,232 acres. The "No Action" alternative could have approximately 57,586 acres of management activity with a potential soil disturbance of 8,638 acres. In considering 168,196 acres of project area, there is very little difference between the alternatives. Cumulatively, the action alternatives could have a potential harvest disturbance of 5.7% Alternative 1, 5.3% Alternative 2, 5.5% Alternative 3, and 5.5% Alternative 4 of the total project area while the No Action alternative would have approximately 5.1% of the area. Future FS harvests would strive to meet the standard to confine the area covered by harvesting operations to 15 percent or less of the individual harvest unit. Previous monitoring of past timber sales has shown that between 1990-1998, the total disturbance factor was 14.2% (USDA-FS 2000a, p. 40). Mitigation measures will continue to be used on FS land to minimize any potential effect of heavy equipment on moderately well and poorly drained landtypes.

The type of harvesting proposed with East Side as well as future FS harvesting would be by stem removal only. Most likely, the same holds true for harvesting on private land. As with East Side and future proposals, low ground surface disturbance methods will be practiced, reforestation prescriptions implemented, and rotation ages will be appropriate for nutrient loss to be minimal. Reforestation prescriptions (fencing, fertilization) would assist in establishing re-vegetation on the forest floor and thus help retain nutrients on site.

Carbon storage and carbon sequestration are of interest particularly relating to global change. As trees grow, they take up carbon dioxide from the atmosphere and store it in biomass. Forests, therefore, can act as a carbon sink. In general, a mixture of older trees with high current carbon storage and younger trees with rapid carbon accumulation rates will provide the best opportunities for maximizing the carbon storage potential of a forest. It is also desirable to maintain stands in a well-stocked state and ensure successful regeneration so that the carbon storage potential of a site is fully realized. For the alternatives considered within the East Side project, final harvest projected for the 1986-2019 time period ranges from 18%-19% of the total project area, including private land (see the “Vegetation Cumulative Effects Summary Table” in the vegetation cumulative effects subsection and discussion in the economics cumulative effects subsection). These future FS harvest proposals would remove additional carbon from the area, and measures would be included to ensure successful regeneration and maintain stocking levels above 60%. By 2019, the increase in younger, faster growing stands capable of accumulating carbon in Alternatives 1 and 3, balanced with the mixture of older stands which have high carbon storage, would provide more opportunity to maximize the carbon storage potential of the area.

It is speculated that future FS activities will include herbicide, fencing, and fertilization. It is unlikely that private landowners will invest in these activities due to the costs associated with them. Cumulatively, all alternatives would have approximately 2% potential soil disturbance resulting from reforestation practices.

Table 27. Potential Cumulative Effects of Land Management Treatments

DISTURBANCE ACTIVITY	Alt 1	Cum. Alt. 1	Alt 2	Cum. Alt. 2	Alt 3	Cum. Alt. 3	Alt 4	Cum. Alt. 4	Cum. Alt 5 No Action
Harvest Treatments									
Harvest Acres	7,978	64,330	4,220	59,696	5,322	61,863	5,345	61,544	57,586
Potential Disturbance (Acres)	1,197	9,650	633	8,954	798	9,279	802	9,232	8,638
Reforestation Treatments Acres									
Fencing Acres	2,314	16,149	0	13,835	1,977	15,812	947	14,782	13,835
Potential Disturbance (Acres)	29	202	0	173	25	198	12	185	173
Herbicide Acres	3,487	28,136	0	24,649	3,005	27,654	2,752	27,401	24,649
Potential Disturbance (Acres)	244	1,970	0	1,725	210	1,936	193	1,918	1,725
Fertilization Acres	1,322	18,066	0	16,744	1,103	17,847	0	16,744	16,744
Potential Disturbance (Acres)	93	1,264	0	1,172	77	1,249	0	1,172	1,172
Transportation									
New Road Construction Miles	15.3	321.3	8.3	314.3	0	306	10	316	306
Potential Disturbance (Acres)	57.5	1,207	31.2	1,181	0	1,150	37.6	1,187	1,150
Miles Re-alignment	1.5	21.7	0.9	20.8	0	19.7	1.1	21.1	19.7
Potential Disturbance (Acres)	5.6	81.5	3.4	78.2	0	74	4.1	79.3	74
Miles of Road Betterment	16	175.3	9.4	168.2	0	159.3	4.2	170.9	159.3
Potential Disturbance (Acres)	19.4	212.5	11.4	203.9	0	193.1	5.1	207.2	193.1
Miles of Road Restoration	92	92	80.6	80.6	86.7	86.7	87.1	87.1	0
Potential Disturbance (Acres)	18.4	18.4	16.1	16.1	17.3	17.3	17.4	17.4	0
Miles of Long Skid	0	0	0	0	3.5	3.5	0	0	0
Potential Disturbance (Acres)	0	0	0	0	6.3	6.3	0	0	0
Miles of Road Decommissioning	7.2	7.2	5.2	5.2	2	2	5.2	5.2	0
Potential Disturbance (Acres)	31	31	22.4	22.4	8.6	8.6	22.4	22.4	0
Stone Pits & OGM									
OGM Well sites-each	3,519	4,359	3,519	4,359	3,519	4,359	3,519	4,359	4,359
OGM Disturbed Area (Acres)	5,736	7,105	5,736	7,105	5,736	7,105	5,736	7,105	7,105
Stone Pits Expansion (# of)	33	99	28	84	26	75	33	99	0
Potential Soil Loss (Acres)	24.75	74.25	21	63	19.5	56.25	24.75	74.25	0
Stone Pit Development (# of)	10	30	8	24	7	21	10	30	0
Potential Soil Loss (Acres)	15	45	12	36	10.5	31.5	15	45	0
Total Potential Soil Loss – Acres	7,471	21,861	6,487	20,730	6,908	21,304	6,870	21,245	20,230

Approximately 93 percent of oil and gas rights are privately owned under the ANF surface. The ANF and oil and gas developers cooperate in placement of facilities. The mineral owners have the dominant domain and, thus, can start development of their minerals after a 60-day planning period. Drill/pump pads and access roads are constructed. Access roads may be up to 40 feet wide when buried pipelines are associated with the roads. Drill/pump pads are usually cut and/or fill pads occupying, on most sites, approximately ¼-acre. In cut/fill situations, natural landforms and internal soil hydrologic function are altered, but commitment of soil and vegetation potential is eventually retrievable. Tank batteries usually require an access road and approximately one acre for the battery itself. A very small portion of this site may have irretrievable loss of soil and vegetation growth potential (<10%). In Table 27, past and future activity includes 4,359 wells. Approximately 7,105 acres of potential disturbance could or has occurred from oil and gas development (this represents approximately 33% of the total soil loss for the action alternatives and 35% for the "No Action" alternative).

There is no future forecast for how many new rock material and/or expanded rock material pits that could be developed. Demand is based on future trends for oil/gas private investments and future spatial scales of timber harvesting. The average yearly ANF-wide addition of new pits would be estimated at between 5 to 20, and yearly expansion of existing pits at 10 to 20. There are approximately 131 existing (plus 48 depleted and 17 restored pits) pits within the project area. It is anticipated that 33 existing pits will be expanded and 10 new pits will be created within the analysis period considered with this project. This, plus a twenty year projection, could result in cumulatively 119 acres of potential soil disturbance. All alternatives are less than 0.1% of total potential cumulative soil disturbance for rock material pit development.

Future road construction/realignment/betterment/restoration is also dependant upon the scale and where activities are located. Some areas for future harvest are well roaded and others need a transportation system. For decades 1 and 2, the ANF has built 180.3 miles (59.3% of planned); betterment (+ re-alignment) - 138.9 miles (115.7% of planned); restoration - 736.7 miles (no target); and temporary roads - 13.1 miles (38.5% of plan) within the project area. See the transportation section for further explanations and Table 27 for cumulative road miles. Since OGM has constructed new roads into areas, the need for the FS to construct new roads has been reduced. However, our use of these OGM roads has resulted in the cumulative total for road betterment to exceed the Forest Plan percent planned. Roads make up approximately 7% of the potential soil disturbance.

Summary of Mitigation Measures and Effectiveness

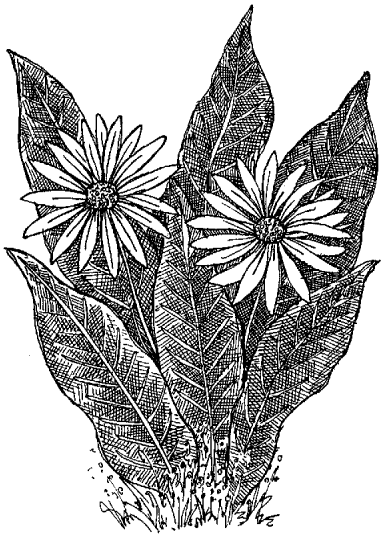
Included with the alternatives are five mitigation measures that pertain to soils and landform. These five [S1, S2, S3, S4, and S5] are identified in Appendix D along with the stands they are associated with. S1 and S2 are operating restrictions regarding equipment use and season of activity; S3 pertains to the grade of skid trails; S4 the type of materials to consider if landings must unavoidably be located on poorly drained landtypes or ELTP GS2a; and S5 identifies guidelines for project layout when wetlands and seeps are present.

A series of stands previously harvested are selected to be monitored each year. The total cutting unit is examined to observe how harvesting was completed near riparian areas or wetlands. The cutting unit is also evaluated as to the effectiveness of erosion control, restoration measures, and timber sale administration. These monitoring activities are reported in the annual monitoring plan.

In the past few years, stands that were selected for monitoring were moderately well or poorly drained where compaction, displacement, and/or puddling would likely occur because of internal soil drainage and/or soil texture. Sample points were randomly selected, and a 100 foot transect at a random azimuth were examined. Each disturbance was measured and recorded as: undisturbed, one-foot or larger rocks, or disturbed. The disturbed criteria had skid trails that showed observable compaction, displaced soil, puddled soil, or erosion. Compacted soils were areas that had three or more skidder passes or were rutted.

The critical element to reduce soil disturbance is surface management. Soil disturbance is reflected in the percent of area covered. This is true for all ecological landtypes. Management of the timber harvesting process is the critical land management function as related to soil disturbance. The indicator of mitigation effectiveness in soil disturbance is keeping the area disturbed to 15% or less of the cutting unit. Although in 1998 the total disturbed area was 19.4%, long-term harvest unit monitoring has shown that the total undisturbed area is 85.8% and disturbed area is 14.2% (disturbed skid trails 7.8%, displacement 1.7%, puddled 0.1%, erosion 0.2%, and observed compaction 4.4%). (USDA-FS 2000a, p. 40) In eight-out-of-nine years the guideline has been obtained of keeping soil disturbance to 15% or less.

In summary, the ANF has been implementing the above harvesting mitigating measures for the last 12 years. Based on past experience and site specific monitoring, these mitigation measures have been effective in reducing impacts such as rutting, compaction, and off-site soil movement associated with commercial timber harvest.



Water and Watersheds

Affected Environment

Watersheds are mosaics of different terrestrial communities connected by a network of streams. These streams contain a mosaic of aquatic habitats that connect the whole watershed through diverse and complex ecological processes. The ecological health of a watershed is important because, when a disturbance disrupts the ecological process/functions in any part of the watershed, it has a rippling effect in the lower portions of the watershed and especially the streams (Vannote et al 1980; Cummins et al 1995).

The East Side project area contains portions of fourteen large watersheds. Three of the watersheds (Millstone, North Allegheny Front, and an unnamed large watershed) totaling 10,562 acres in both public and Forest Service land within the project boundary have no activities proposed within them. Therefore, they are not considered to be part of the affected environment. The remaining eleven watersheds within the project area (157,634 acres) are considered the affected environment for the water/watershed resource. These include Bear Creek, Big Mill Creek, Kinzua Creek, Clarion River, South Branch Tionesta Creek, Spring Creek, Sugar Run, Tionesta Creek, West Branch Clarion River, West Branch Tionesta Creek, and West Branch Tunungwant Creek. Within these eleven watersheds, there are several subwatersheds where vegetation management and corresponding road activities are proposed. Table 28 lists the total acres of watersheds in the affected environment for two scales: within the East Side project area and on the ANF. Except where noted, most watersheds contain both private and public lands on the forest.

Table 28. Watersheds with Proposed Vegetation Treatments and Road Activity.

Watershed	State Classification	Total Acres (public & private) within and outside the Mortality Zone	Total within East Side (public and private)
Bear Creek	HQ-CWF	25,911	7,446
Big Mill Creek	HQ-CWF	21,163	12,656
Kinzua Creek	CWF[1]	116,480	33,202
Clarion River Watershed	HQ-CWF	77,380	1,654
South Branch Tionesta Creek	HQ-CWF[2]	55,150	36,345
Spring Creek	HQ-CWF	56,095	19,006
Sugar Run	HQ-CWF	12,710	4,772
Tionesta Creek	CWF	167,184	19,849
West Branch Clarion River	CWF[3]	59,815	10,500
West Branch Tionesta Creek	CWF	83,876	11,552
West Branch Tunungwant Creek	HQ-CWF	27,200	652

1 Mud Lick Run, Windfall Run and S. Branch Kinzua Creek, all classified as HQ-CWF.
2 Crane Run, classified as Exceptional Value.
3 Wolf Run and Silver Run, both classified as HQ-CWF.

Water on the ANF is abundant. On average, the ANF receives 42" of precipitation annually, resulting in 21" of runoff. Most waters support some form of aquatic life, and one watershed (Big Mill Creek) is the municipal watershed for the borough of Ridgway. Sandstone and shale dominate the geology, and thus provide limited amounts of buffering capability. As a result, stream water is susceptible to fluctuation in acid levels (or pH), especially during runoff from rain events or snowmelt.

There are approximately 516 miles of perennial and intermittent streams that flow through the East Side project area. In addition to streams, there are numerous springs and seeps distributed throughout the landscape. The headwaters of the streams within the project are one of the most important segments of the watershed because they are more easily impacted when management activities are implemented. These small streams provide high levels of water quality and quantity sediment control, nutrients, and woody debris for the downstream reaches of the watershed.

Riparian areas are geographically delineable areas with distinctive resource values and characteristics that are comprised of the aquatic and terrestrial riparian ecosystems. Riparian areas link the terrestrial environment with the aquatic environment that provides shade, input of nutrients, and organic materials. These inputs provide nutrients for growth of all downstream aquatic plants as well as food and habitat for insects on which fish feed. This riparian ecosystem has the most diverse and rich plant species on the ANF (Williams 1996). Wetlands are also part of riparian ecosystems. As noted in the landform section, there are approximately 12,835 acres of riparian areas within the East Side project area. The Wildlife section under the Biological Environment discusses riparian areas in terms of wildlife habitat.

The quality of water within the project can be characterized as good, and where surveys have been conducted, water quality meets state water quality standards as outlined in Title 25, Chapter 93 of the Pennsylvania Code (PA-DEP 1994). The majority of streams flowing through the project are designated by the Pennsylvania Department of Environmental Protection (DEP) as High Quality-Cold Water Fishery (HQ-CWF), or Tier 2 under EPA's recent anti-degradation ruling (Federal Register 12/9/96). One subwatershed, Crane Run, is classified as an Exceptional Value (EV) watershed. The remainder of the streams are classified as Cold-Water Fishery (CWF). Additionally, Crane Run is a designated Wilderness Trout Stream by the PFBC (Pennsylvania Fish and Boat Commission). Waters on the ANF flow either to the Clarion River or to the Allegheny River. Segments of both rivers are federally designated wild and scenic rivers. Table 28 identifies the DEP classifications for the watersheds in the affected environment.

Water-Road Interaction

There has always been a connection between human transportation corridors and bodies of water. Early trails and paths were often alongside streams for people to meet their daily needs, and new inhabitants to an area tended to settle near lakes, streams, or rivers. Near the water, terrain tends to be gentler, grades are often less steep. Therefore, it has often been desirable and easier to build roads in these areas and desirable to build roads where people are located and to gather needed resources (USDA- FS, 1997).

Within the East Side project area, the road system is essentially in place either from historic design or based on current standards and guidelines. Road locations can have an effect on water quality. Roads located along streams can potentially contribute sediment into streamcourses, causing changes in habitat for fisheries and aquatic invertebrates. Runoff and sedimentation from dirt and gravel roads has the most potential for affecting water resources. Determining the exact amount (or even estimating the amount) of sediment that might enter a streamcourse is difficult due to various factors such as weather, traffic patterns, quality of surface material, and drainage of road runoff. Therefore, rather than discussing amount of sediment, the affected environment can be described in terms of *potential sources* of sediment. These sources include the type of road surfacing used, number of road-stream crossings, and how close streams and roads are located to each other.

Presently, there are five types of surfacing used on ANF roads: pit-run, aggregate, limestone, natural, and bituminous (paved). Pit run is material taken from pits on the ANF, and consists primarily of sandstone. Aggregate surfacing, commonly called commercial stone, is typically a harder stone than sandstone. It is bought commercially from a gravel company. Limestone is similar to aggregate, but is a harder stone and its angular shape allows it to pack tighter making a better and less erosive running surface. Natural is the native material on site, i.e. no surfacing is brought in. Paved surfaces are blacktop roads. Rock surfaced roads will result in much less sediment than roads that are not surfaced with stone.

A road-stream crossing is where a road crosses a natural drainage channel or unchanneled swale. Such crossings have a potential for runoff. Using GIS, road-stream crossings were identified for the East Side project area. The information presented in Table 29 identifies the number of stream crossings found within the affected environment that potentially could contribute sediment. There are approximately 152 stream crossings from roads under FS jurisdiction and 49 identified stream crossings from OGM or municipal roads that potentially could contribute sediment into streams. There are 177 "Other" road crossings that are unclassified and unknown as to their condition or ownership but it is speculated that they too are potential sources of sedimentation.

To address the concern of road runoff and sedimentation to streams on the ANF, eight surveys were conducted in 1994 to determine the effectiveness of filter strips between Forest roads and streams (USDA-FS 1996). Filter strip effectiveness monitoring on the ANF has shown that when a road is within 200'+ from a streamcourse, on average, approximately 66% of potential road runoff may reach the streamcourse for a variety of reasons. Potential runoff is that runoff that normally runs off the ditch side of the road and into the ditchline. From here, the water is collected and has the potential for reaching a streamcourse if located close enough. Because ANF roads are crowned in the middle, the other half of the road (fill slope side) typically does not have a potential to reach a streamcourse. Therefore, the 66% is from only one half of the road surface. Beyond this 200'+ filter strip, there is minimal movement of sediment to a stream. However, 300' was used in the analysis to insure any potential runoff was evaluated. Table 29 identifies the amount of road mileage in the project area that is within 300' of a stream which potentially could contribute sediment. Currently, there are approximately 76.8 miles of Forest Service dirt and gravel roads and approximately 17.4 miles of OGM or Municipal roads within 300' of a streamcourse that potentially could contribute sediment. There are also 82.9 miles of "Other" roads within 300' of a streamcourse that have not been identified as to ownership or surfacing type.

Watershed Descriptions

The following describes each watershed in terms of location, aquatic surveys that have been done, and the type of resource activities that have occurred within the watersheds within the East Side project area. Each watershed is also discussed in terms of the present condition of road surfacing, number of stream-road crossings, and miles of road within 300' of a stream. Table 29 lists this information by watershed.

Table 29. Sources Of Potential Sediment: Number Of Road Miles Within 300' Of A Stream And Number Of Road-Stream Crossings For The East Side Project Area.

Road-Stream Crossings							
Watershed	FS			OGM & Municipal			Other
	IMP/AGG	*LIM*	*NAT*	*IMP/AGG*	*LIM*	*NAT*	
Bear Creek	7						4
Big Mill Creek	8	4		1			17
Clarion River	1						4
Kinzua Creek	37	13	2	6			26
South Branch Tionesta Creek	21	4	1	19		2	61
Spring Creek	12			8			26
Sugar Run	6	2					3
W. Br. Tunungwant Creek							
Tionesta Creek	16	3		6			13
West Branch Clarion River	11		1	4			10
West Branch Tionesta Creek		3		3			13
TOTAL	**119**	**29**	**4**	**47**	**0**	**2**	**177**
Road Mileage Within 300'							
Watershed	FS			OGM & Municipal			Other
	IMP/AGG	*LIM*	*NAT*	*IMP/AGG*	*LIM*	*NAT*	
Bear Creek	2.4			0.04			2.4
Big Mill Creek	4.1	2.7		0.11			9.5
Clarion River	1.0						0.6
Kinzua Creek	19.2	5.9	1.0	1.0			11.3
South Branch Tionesta Creek	10.7	2.6	0.5	6.5		1.5	29.8
Spring Creek	5.8			2.7			11.0
Sugar Run	3.00	1.00					1.0
W. Br. Tunungwant Creek							
Tionesta Creek	4.8	2.2	0.1	1.63			5.8
West Branch Clarion River	5.6	0.3	2.4	0.8			7.1
West Branch Tionesta Creek	0.7	0.8		3.2			4.4
TOTAL	**57.3**	**15.5**	**4.0**	**15.9**	**0**	**1.5**	**82.9**

FS: Forest Service jurisdiction.

OGM: Roads currently under oil, gas, mineral jurisdiction
Municipal Roads under state or township jurisdiction
Other: This category includes private roads or roads identified through the cartographic feature file (CFF) coding system in GIS. No GIS information has been gathered for these roads but it is speculated that their surfacing is either gravel or dirt.

IMP/AGG: Improvement/aggregate. Improvement is sandstone taken from pits on the ANF, and aggregate is stone acquired commercially.
LIM: Limestone Surfacing
NAT: Natural. No stone is placed on a road surface.

Bear Creek Watershed

The Bear Creek Watershed flows directly into the Clarion River and has several named and unnamed tributaries. In all, there are approximately 68 miles of streams within the watershed. The watershed is heavily forested, supporting a variety of land management activities such as timber harvesting and oil and gas operations. Dispersed recreation in the form of fishing, hunting, and camping are popular.

The most recent aquatic survey of Bear Creek, conducted in 1991 (Woomer and Lee 1992), found suitable water quality for the propagation and viability of aquatic communities. Limited buffering was a concern expressed in the survey report that could cause depressed pH levels. This appears to be a natural occurrence because of the geology of the area.

Within the project, there are 7 graveled road stream crossings under FS jurisdiction. The surfacing is with pit-run material taken from the ANF and largely consists of sandstone. There are 4 road crossings in the "Other" category where no information is known as to ownership or surfacing. Gravel roads within 300' of a stream and under FS jurisdiction total 2.4 miles, while Municipal roads total 0.04 mile. There is an additional 2.4 miles of "Other" roads.

Big Mill Creek Watershed

This watershed is located directly east of the Bear Creek watershed and flows directly into the Clarion River. It has numerous named and unnamed tributaries totaling approximately 70 miles of streams. This is a municipal watershed, providing water for the borough of Ridgway. The watershed is heavily forested. Timber harvesting and oil and gas operations dominate the land management activities on public lands. Fishing, hunting, and dispersed camping are popular forms of recreation. Recent road work on FR 143 has addressed sedimentation concerns along Big Mill Creek.

Water quality surveys have occurred almost yearly in this watershed since 1990. The surveys focused on the acidity and the limited buffering capacity of the water. The primary concern was whether or not the watershed was able to support a catchable trout fishery with fish stocked by the Pennsylvania Fish and Boat Commission. The water exhibits significant pH declines in the spring months and during higher runoff events throughout the year. As a result, historic records indicate a low abundance of fish species.

Gravel stream crossings on FS roads total 12 within the project. In addition, there is one Municipal crossing and 17 "Other" crossings in unknown condition. FS roads within 300' of a stream total 6.8 miles. Of the 6.8 miles, 2.7 miles are surfaced with limestone. There is an additional 0.1 miles of Municipal road within 300' of a stream, and an additional 9.5 miles of road in the "Other" category.

Clarion River Watershed

Forming the southern boundary of the ANF is the Clarion River watershed. The boundary of this watershed was modified to meet only ANF objectives and is located on the north side of the Clarion River.

Only one stream crossing is located within the project. This is a crossing in the headwaters of Silver Creek, and is surfaced with pit-run material consisting of primarily sandstone. There are four "Other" road crossings. Other potential sediment sources are a one-mile section of ANF road located within 300' of primarily Little Mill Creek, and a short section in the Silver Creek drainage. There is an additional 0.6 miles of "Other" road with unknown surfacing type.

Kinzua Creek Watershed

The Kinzua Creek watershed flows directly into the Allegheny Reservoir. There are approximately 183 miles of streams within the portion of the watershed within the ANF (covering 58,655 acres). This watershed supports a wide variety of land management activities including oil and gas operations, timber harvesting, fishing, hunting, and dispersed recreation. It also includes the small town of Westline within the ANF.

Within the Kinzua Creek watershed is the South Branch Kinzua Creek. The latest survey of South Branch Kinzua Creek was conducted in 1993 (Woomer and Lee 1994). The section upstream of Hubert Run was recently placed into the State's Wilderness Trout Stream program. Downstream of Hubert Run, South Branch Kinzua Creek is densely shaded by forest cover. Good physical fish habitat exists within this segment of South Branch. Fish diversity was good, ranging from seven species just downstream of Hubert Run to 18 species near the mouth. The measurement of basic water quality parameters indicate that water meets State standards (PA-DEP 1994) and is suitable for the propagation of aquatic species.

The latest survey for the Windfall Run subwatershed occured in 1983 (Hasse 1984). The survey noted that at the time of the survey, water quality appeared to be influenced by active oil and gas operations as several parameters were elevated above what is commonly found for this area. However, fish population numbers were very high, and there was evidence of natural reproduction in brook trout and brown trout. A survey of aquatic insects at the same time found diversity values to be representative of a relatively unpolluted stream.

The Mud Lick Run drainage actually flows into the Allegheny Reservoir for an approximately six-month period from spring to fall when the reservoir is filled with water. The remainder of the year, Mud Lick Run flows directly into Kinzua Creek. The most recent survey occurred in 2000 (USDA-FS 2000b). The survey documented six species of fish, and was dominated by brook trout and mottled sculpin. Previous to this, a survey was done from 1996-1998 (unpublished). Fish species were dominated by brook trout and mottled sculpin as well. Basic water quality parameters were found to be suitable for the propagation of a cold-water aquatic community. Aquatic insect surveys were dominated by clean water indicators such as mayflies, caddisflies, and stoneflies.

Within the Kinzua Creek watershed, there are 58 dirt and gravel road stream crossings, 52 which are on FS roads. In addition, there are 26 “Other” crossings. Dirt and gravel roads within 300' of streamcourses total 27.1 miles, of which 26.1 miles are considered FS roads. Of the 26.1 miles, 5.9 miles are currently surfaced with limestone. There is an additional 11.3 miles of “Other” road in unknown condition that may have a potential for contributing sediment to a streamcourse.

South Branch Tionesta Creek Watershed

The South Branch Tionesta Creek watershed has approximately 167 miles of streams within the watershed. East Branch, found within this large watershed, was surveyed in 1993 (Woomer and Lee 1994a). Water temperatures were higher in the headwater reaches as a result of limited canopy cover over the stream to provide shade. Cold-water species were also less abundant in these reaches. Given the elevated levels of certain parameters, water quality was still suitable for the propagation and viability of fish species, although perhaps not at a fully stocked level. Numerous surveys of the tributaries have also been conducted. These surveys found suitable water quality for the viability and propagation of aquatic species. Because of the small size of the tributaries, the diversity of fish species was low.

Within this watershed is Crane Run, a Pennsylvania Fish and Boat Commission designated Wilderness Trout Stream. The watershed is also designated as Exceptional Value by the Pennsylvania Department of Environmental Protection. Within the ANF, Crane Run was last surveyed in 1995 by the PFBC (Woomer and Lee 1997a). The survey documented nine species of fish in this headwater stream within the lower reaches. A water quality analysis was done at the same time, and the results met state criteria. A more recent survey was conducted in 1998 on private land in the upper reaches (Headwaters Charitable Trust 1999). That survey found excellent brook trout populations, and the aquatic insect surveys suggested an unimpacted aquatic system.

Within the project there are 47 dirt and gravel road crossings, 26 of which are on FS roads. In addition, there are 61 "Other" crossings of unknown condition. Dirt and gravel roads within 300' of a streamcourse total 21.8 miles, of which 13.8 miles are considered FS roads. Of the FS roads, 2.6 miles have limestone surfacing. There is an additional 29.8 miles of "Other" road of unknown condition that is located within 300' of a streamcourse.

Spring Creek Watershed

The Spring Creek watershed flows into the Clarion River, and there are approximately 170 miles of streams within the watershed. Most of the watershed is in public ownership, including a large section of state land managed by the Pennsylvania Game Commission. As a result, much of the riparian areas are publicly owned.

Basic water quality parameters were measured during a survey in 1995 (Woomer and Lee 1997). The results of that survey showed the parameters to be within acceptable limits for the propagation of an aquatic community. As an indication of the good water quality, 24 fish species (one species was stocked) were documented in the survey.

Within the project, there are 20 gravel road stream crossings. Of these 20 crossings, 12 are on FS roads. In addition, there are 26 "Other" crossings of unknown condition. Roads within 300' of a streamcourse total 8.5 miles, of which 5.8 miles are considered FS roads. There is an additional 11 miles of "Other" road of unknown condition.

Sugar Run Watershed

The Sugar Run watershed has approximately 35 miles of streams within the watershed with most of the riparian area in federal ownership. Primary uses include oil and gas operations, timber harvest, and a variety of recreation activities. Sugar Run empties directly into the Allegheny Reservoir. Water quality survey results from 1992 and 1993 (Woomer and Lee 1994b) show basic parameters to be suitable for the propagation of aquatic species.

Road activity with the potential for contributing sediment to streams include 8 gravel road-stream crossings. In addition, there are 3 "Other" crossings of unknown condition. There are 4.0 miles of road within 300' of streams. One mile of this amount is surfaced with limestone. There is an additional 1.0 miles of "Other" road in unknown condition.

Tionesta Creek Watershed

The characterization of the Tionesta Creek watershed begins at the confluence of the West Branch and South Branch of Tionesta Creek, downstream to the Allegheny River. This watershed has approximately 540 miles of streams within this watershed downstream of the West and South Branches. Proposed vegetative treatments are proposed in two subwatersheds, Salmon Creek and Bluejay Creek.

Located in the headwaters of Salmon Creek is Beaver Meadows Lake, a 34-acre shallow water impoundment. Land management activities are dominated by motorized trail riding, oil and gas operations, and some timber harvesting.

The most recent survey of Salmon Creek was conducted in 1989 (Woomer and Lee 1998b). Basic water quality parameters were suitable for the propagation of aquatic species at the time of the survey. However, the report noted that there is some limiting factor to the establishment of a sustainable trout population. Various suggestions are elevated stream temperatures due to the savannah environment along several sections of the stream, the warm water released from Beaver Meadows lake, ponded and warmed water from beaver dams, and episodic depressions in pH. Beaver Meadows lake is very acidic, and likely contributes to the inability of Salmon Creek to support a trout population. Land management activities are dominated by oil and gas operations and some timber harvesting.

A recent survey conducted in 1998 on Bluejay Creek by the Pennsylvania Fish and Boat Commission (Woomer and Lee 1998a) and the Allegheny National Forest found water quality to be good overall but found relatively high levels of aluminum and iron which can become toxic to fish under low pH conditions. Fish abundance in the headwater reaches continues to be depressed. Near the mouth of the watershed however, water quality is slightly more productive, and the diversity of fish species increases closer to Tionesta Creek. Land management activities in this watershed are dominated by motorized trail riding, oil and gas operations, and some timber harvesting.

Within this large watershed, there are 25 gravel road-stream crossings, 19 of which are on FS roads. There are 13 additional crossings in of unknown condition. Dirt and gravel roads within 300' of a streamcourse total 8.7 miles, of which 7.1 miles are considered FS roads. Limestone surfacing occurs on 2.3 miles of the ANF roads. There is an additional 5.8 miles of “Other” roads within 300’ of a streamcourse that potentially could be sources of sediment.

West Branch Clarion River Watershed

The West Branch Clarion River watershed is a major branch of the Clarion River. Most of this watershed is on private land with only the headwater reaches located on the ANF. There are approximately 192 miles of streams in this watershed. The latest survey was conducted in 1988 (Woomer and Lee 1990). The measurement of basic water quality parameters indicates the water quality to be suitable for the viability and propagation of aquatic species. Stream temperature and habitat in the lower reaches (on private) near the mouth were mentioned as limiting factors, although several large brown trout were surveyed along with seven additional species.

Dirt and gravel road crossings within the project total 16, of which 12 are on FS roads. Another 10 “Other” crossings exist in the project area. Roads within 300' of a streamcourse total 9.1 miles, a majority (8.3 miles) that is considered under FS jurisdiction. Limestone surfacing occurs on 0.3 miles of the ANF roads. An additional 7.1 miles of “Other” roads are located within 300' of streams, and are in unknown condition.

West Branch Tionesta Creek Watershed

West Branch Tionesta Creek watershed includes a mixture of public and private ownership. Numerous streams within the watershed total approximately 241 miles.

Twomile Run flows into the West Branch of Tionesta Creek at the town of Sheffield. A large portion of the Twomile Run subwatershed is privately owned, including the riparian area along Twomile Run and three of the major tributaries. Within the riparian area are portions of the towns of Sheffield, Ludlow, and Wetmore. Land use activities are primarily oil and gas operations, timber management, and recreation related activities. A recent survey of Twomile Run conducted in 1993 (Woomer and Lee 1994c) showed basic water quality parameters to be suitable for the propagation of aquatic species. The survey documented a good diversity of fish species totaling 19 naturally reproducing species and 1 stocked species.

Graveled stream crossings within the project total 6, of which 3 are on FS roads. There is an additional 13 crossings in “Other” ownership, and their condition is unknown. Roads within 300' of a streamcourse total 4.7 miles, of which 1.5 miles are under FS jurisdiction. Limestone surfacing occurs on 0.8 miles of the FS roads. In addition, there is 4.4 miles of “Other” roads within 300' of streams, but their condition is unknown.

West Branch Tunungwant Creek Watershed

This watershed encompasses mostly private land, but includes public ownership in the headwater sections.

The latest survey was conducted in 1996 (Woomer and Lee, 1999) and was done just outside the city limits of Bradford to assess the current management of a special fishing regulated section of stream. Basic water quality parameters were suitable for the propagation of aquatic communities. However, elevated stream temperatures were not suitable for cold-water species, such as brown trout. The reason may be due to the several impoundments located throughout the watershed on private lands that allow water to warm. A prior survey (PFBC 1986) was conducted on private lands in the upper reaches but still downstream of Reservoir No. 5. Basic water quality parameters were suitable for the propagation of aquatic species, including cold-water species such as brook and brown trout.

There are no stream crossings and no roads within 300' of a stream in the East Side project area.

Environmental Consequences

Direct/Indirect Effects

Water-Herbicide Interaction

A thorough analysis of potential effects to water quality and fisheries from the use of the herbicides sulfometuron methyl and glyphosate was completed in 1991 (USDA-FS 1991). The analysis assessed potential effects under different scenarios, including a worst-case scenario. The conclusion of the analysis found that there would be no impacts to water quality or fisheries provided that the standards and guidelines in the Forest Plan for the protection of water resources is implemented. Refer to Appendix D, which identifies the stands having these mitigation measures.

The effectiveness of mitigation measures for the use of herbicides and the protection of water quality have been conducted, and are summarized in the 1987, 1988, and 1989 Monitoring and Evaluation Reports for the ANF (USDA-FS 1988; USDA-FS 1989; USDA-FS 1990). The conclusion was that the use of 25-75' buffers was effective at preventing the active ingredients of Roundup® and Oust® from entering nearby streamcourses. More recent monitoring efforts occurred in 1998 and 1999. The 1998 effort monitored the effectiveness of buffer strips between a powerline right-of-way and a stream and reservoir. The results showed that there was no detectable amounts found in the water samples collected (Norris 1998). However, the buffer strips used in this effort were 600' and 1000', far in excess of normally used buffer strips of 25-75' on the ANF. The 1999 monitoring effort (unpublished, work still in progress) assessed narrower buffer strips than those mentioned above. The monitoring in 1999 also showed no herbicide entering streamcourses with buffer strips as narrow as 13' for cut stem treatment, and 58' for low volume foliar.

Herbicide treatment is proposed in the municipal watershed for Ridgway. The watershed, Big Mill Creek, drains into Ridgway Reservoir where the Borough of Ridgway takes its drinking water. Herbicide application has occurred in this watershed in the past, with no evidence of herbicide getting into the water (see the Human Health and Safety section). As a conservative measure for herbicide treatments in this watershed, the applications will be staggered to avoid treating any more than 40 contiguous acres in one year.

In 1994, the Pennsylvania DEP granted waivers to municipal water suppliers for the monitoring of certain synthetic organic compounds, including glyphosate. Glyphosate, the active ingredient in Roundup®, is commonly used on the ANF to treat understory vegetation. It is highly immobile in soil and readily adsorbed to soil particles. The waiver was granted because of its non-leaching nature. This granting of the waiver implies that there is minimal concern with the use of this product on water resources.

Based on past results of monitoring for herbicides on the ANF, there are no direct or indirect effects anticipated to water resources.

Water-Harvesting Interaction

Based on past monitoring, we have seen very little, if any, sedimentation to streamcourses from the actual harvesting of timber. Filter strips have been effective at trapping sediments that might move off-site from a timber harvest unit. The use of the standards and guidelines in the Forest Plan (2500 water and soil management section) will be implemented to mitigate any potential impacts to water resources from land-disturbing activities with the East Side project. Filter strips are included along watercourses to minimize sediment introduction; guidelines are included to provide for the long-term input of large woody debris into streamcourses; and buffer strips are included to provide adequate canopy cover to maintain cold-water stream temperatures.

Based on past experience and monitoring of several timber harvest sites, no direct or indirect effects to water resources are anticipated from this project.

Road-Water Interaction

Erosion from roads occurs when large volumes of water collect during and following storms or snowmelt. Large volumes of water have increased velocity which increases not only the cutting power of the water but the sediment load discharged into the filter strip. Sediments from any road failures at stream crossings are deposited directly into streams and can alter the physical habitat by embedding larger substrate, filling pools, and increasing turbidity. All these can affect aquatic species. Please refer to the Wildlife section, Biological Environment for a discussion of aquatic management indicator species and aquatic habitat.

Determining how close roads should be located to streams is not evaluated solely by distance. As stated in the Forest Plan (USDA-FS 1986a), 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 streamcourse. The most important criteria is the ability of the forest floor (ground cover) to filter runoff. Run-off draining into an area dominated by hemlock will likely have very little to no filtering capability. However, runoff draining into an area of dense grass and fern will often provide good filtering capabilities. The type of road surfacing material to be used will depend on how effective the filtering capabilities of the filter strip are.

Most FS roads have pit-run surfacing material. Pit-run surfacing is primarily made up of sandstone, which is susceptible to breaking down into smaller particles at faster rates. This breakdown easily becomes runoff. The use of limestone as a road surfacing stone in critical locations will reduce the amount of sediment runoff (and turbidity) currently coming off sandstone-surfaced roads. Recent work done in 1995-1996 (Trieu 1999) has shown limestone to be effective at reducing sediment when placed on road surfaces. The data suggests a significant reduction in sediment concentration and turbidity from sections of road surfaced with limestone, even under higher discharge amounts. The results of this study are summarized in the 1997 Allegheny National Forest Monitoring and Evaluation Report (USDA-FS 1998a).

Three streams on the ANF are currently being monitored for sediment, two in conjunction with road reconstruction and one with an OGM development. One road had limestone placed on a stream crossing, and the other road had an approximate 700' wide filter strip. These are still being monitored, but there has been no sediment reach the stream through the 700' filter strip (USDA-FS 2000a), and the stream below the limestone surfaced crossing has shown no significant change in the amount of sediment in the stream (USDA-FS 1998a). The monitoring near the OGM development has just begun.

During the East Side analysis, existing roads proposed for use with this project were evaluated as far as their potential to contribute sediment (miles within 300' of a stream, road-stream crossings, and surface material used) and whether the road should be rerouted, closed and seeded, or left in place and improved to reduce sedimentation. Table 30 lists the proposed East Side activities. It should be noted that both no action and action alternatives would have normal road maintenance activities. Normal road maintenance could include ditching, grading, and spot re-surfacing to return the road to its original condition.

For all watersheds, the No Action Alternative (Alternative 5) would have no improvements to the road system, including surfacing roads with limestone to reduce sediment runoff. As shown in Table 31, No Action would maintain the current situation of 15.5 miles surfaced with limestone and 29 crossings surfaced with limestone. Alternative 5, no action, would not decommission any road segment or crossing. As a result, there will be a higher level of sediment production continuing, especially on high-usage, open roads.

Alternatives 1, 2, and 4 propose new road construction activities. The amount of construction is in response to the issues and degree of harvest activity. These three alternatives also propose road re-alignment. New road construction and re-alignment follow the sedimentation and water quality standards provided in the Forest Plan, as well as the "Guidelines for Road Design in Proximity to Streams on the ANF" included in the project file. The guidelines provide further direction to minimize sediment runoff from roads. Alternatives that propose new road construction will not increase the number of road-stream crossings within the project area, however, the amount of miles within 300' of a stream will increase by 0.4 mile. As a mitigating factor, this segment will have limestone surfacing. In Alternatives 1-4 sections of existing road corridors which are no longer needed for management purposes and which are potential sources of sedimentation are also proposed for decommissioning.

Table 30. Summary of Proposals for the East Side Project Area

Activity	Alt. 1	Alt. 2	Alt. 3	Alt 4.	Alt. 5
# of Stream Crossings to have limestone surfacing	28	27	24	28	0
# of Stream Crossings proposed for decommissioning	5	2	2	2	0
Road Miles Within 300' of stream to have limestone surfacing	15.5	12.3	12.2	13.7	0
Road Miles Within 300' of stream proposed for decommissioning	1.42	1.48	0.70	1.48	0

Alternatives 1, 2, and 4 propose reconstruction-betterment activities. Betterment consists of culvert replacement, improvement of cross drainage and resurfacing of the existing roadbed. Alternative 3 does not propose betterment activities in response to the issues and therefore, any areas currently contributing sediment would continue to do so. All action alternatives propose some level of road restoration, a minor form of road reconstruction. Restoration consists of spot surfacing and re-conditioning of the roadbed such as grading and cleaning ditch lines and culverts. During and immediately following these proposed road activities, sedimentation associated with runoff would be the greatest. As the exposed surface stabilizes, sedimentation would decrease. Mitigation measures will help to reduce sedimentation and effects on water quality and the aquatic community during the construction phase.

In all action alternatives, the percentage of 1) existing roads within 300' of a streamcourse and 2) stream crossings, will increase for those surfaced with limestone. Several crossings and roads within 300' of a streamcourse will be decommissioned.

Of any FS activity that occurs on the ANF, roads have the greatest potential for impacting water resources and fisheries habitat While native aquatic species are adapted to their sandstone dominated environment, the introduction of a chronic source of sediment from roads can have short- and long-term effects as discussed earlier. In some cases, the amount of runoff from a road to a stream may still fall within a normal range of streamflow levels. In other cases, excessive amount of runoff may cause streamflows to fall outside the range, thus causing sediment buildup (aggradation) or scouring (degradation) depending on the steepness of the stream channel.

Runoff from road segments located in close proximity to streamcourses will continue to contribute additional runoff to streams. The amount of sediment will be reduced from what is currently occurring as a result of limestone surfacing. Direct effects will continue to occur to water quality and fish habitat, however, that effect will be reduced as a result of the limestone surfacing. Indirect effects will also continue to occur, but that effect will also be reduced due to the proposed limestone surfacing.

Table 31. Summary of Road/Water Interactions for the East Side Project Area

Stream Crossings	Existing Condition	Alt. 1	Alt. 2	Alt. 3	Alt 4.	Alt. 5
FS crossings with Limestone	29	56	56	53	57	29
FS crossings with Non-limestone	123	94	94	97	93	123
OGM-Municipal/Other	49/177	49/177	49/177	49/177	49/177	49/177
Miles Within 300'	**Existing Condition**	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
FS roads with Limestone surfacing	15.5	31	27.8	27.7	29.2	15.5
FS roads with Non-limestone	61.3	55.1	57.6	54.5	53.0	61.3
OGM-Municipal/Other	17.5/82	17.5/82	17.5/82	17.5/82	17.5/82	17.5/82

Watershed Descriptions

The paragraphs that follow discuss the direct and indirect effects of the road activities on each watershed within the East Side project area. Where appropriate, a table is included to show the existing condition and the resulting effect of the alternatives for both road-stream crossings and miles within 300’ of a stream.

Bear Creek

Land management activities are proposed in three subwatersheds within the Bear Creek watershed, including Maple Run, Pigeon Run, and an unnamed drainage. All of the road activity proposed in Alternatives 1-4 will occur beyond 300' of any streamcourse. In addition, there are no stream crossings proposed for use. As a result, there are no direct/indirect effects associated with proposed road activity in this watershed.

Big Mill Creek

Land management activities are proposed in five subwatersheds within Big Mill Creek. Proposed road activities within 300' of a streamcourse will utilize existing roads currently surfaced with limestone (2.7 miles) that are located within 300' of a streamcourse. In addition, 457' (0.09 miles) of roads currently surfaced with pit-run stone will be used in Alternatives 1-4, and will be surfaced with limestone as a mitigating factor. Sediment will be reduced, and not all of the remaining sediment is expected to reach a streamcourse because of vegetative filtering. No stream crossings are proposed for improvement, as the crossings that will be utilized are currently surfaced with limestone as a mitigating factor from a previous project. As a result, there are no anticipated effects from the proposed road activities in the Big Mill Creek watershed.

Stream Crossings	***Big Mill Creek***					
Existing Condition	FS crossings with Limestone Surfacing	4				
	FS crossings with Non-limestone Surfacing	8				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	0	0	0	0	0
	Crossings Obliterated	0	0	0	0	0
Resulting Effect [Existing + Proposals]	FS crossings with Limestone Surfacing	4	4	4	4	4
	FS crossings with Non-limestone Surfacing	8	8	8	8	8
Miles Within 300' of Stream	***Big Mill Creek***					
Existing Condition	FS roads with Limestone	2.7				
	FS roads with Non-limestone	4.1				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	0.09	0.09	0.09	0.09	0
	New Road Construction	0	0	0	0	0
	Roads obliterated w/in 300'	0	0	0	0	0
Resulting Effect [Existing + Proposals]	FS roads with Limestone	2.8	2.8	2.8	2.8	2.7
	FS roads with Non-limestone	4.0	4.0	4.0	4.0	4.1

Clarion River

Proposed vegetative treatments are located entirely within the extreme headwater sections of one subwatershed, Little Mill Creek. Road activities proposed in Alternatives 1-4 include the use of one stream crossing in the extreme headwater section of Little Mill Creek by FR340; the use of one mile of road within 300' of primarily Little Mill Creek; and the use of a short section along Silver Creek. To mitigate the potential effects of sediment runoff into the streams, limestone surfacing will be used on these sites. Although this one mile of road is within 300' of a streamcourse, not all of the runoff will reach the stream because of vegetative filtering. As a result of the mitigating factors, sediment input to streamcourses will be further reduced which should result in an improvement to overall water quality and stream substrate in Little Mill Creek. There would be no improvements under Alternative 5.

Stream Crossings	***Clarion River***					
Existing Condition	FS crossings with Limestone Surfacing	0				
	FS crossings with Non-limestone Surfacing	1				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	1	1	1	1	0
	Crossings Obliterated	0	0	0	0	0
Resulting Effect [Existing + Proposals]	FS crossings with Limestone Surfacing	1	1	1	1	0
	FS crossings with Non-limestone Surfacing	0	0	0	0	1

Miles Within 300' of Stream	***Clarion River***					
Existing Condition	FS roads with Limestone	**0**				
	FS roads with Non-limestone	**1**				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	1	1	1	1	0
	New Road Construction	0	0	0	0	0
	Roads obliterated w/in 300'	0	0	0	0	0
Resulting Effect [Existing + Proposals]	FS roads with Limestone	1	1	1	1	0
	FS roads with Non-limestone	0	0	0	0	1

Kinzua Creek

Land management activities are proposed in three subwatersheds, including South Branch Kinzua Creek, Windfall Run, and Mud Lick Run. Within the South Branch Kinzua Creek subwatershed, the only vegetative treatments that are occurring are in the Hubert Run area, which is the downstream boundary for the Wilderness Trout Stream designation on the South Branch.

One stream crossing on FR278 is proposed for use in Alternatives 1-4. This crossing is over Windfall Run and is currently surfaced with pit-run stone. As a mitigation measure, the crossing will be surfaced with limestone. Additional roads will have limestone surfacing as well, primarily in Alternatives 1, 3, and 4, with only a minor amount in Alternative 2. As a result, Alternatives 1, 3, and 4 would realize a larger reduction in current sediment delivery to streams, reducing any negative indirect/indirect effects that may be occurring. There would be no improvements under Alternative 5.

Stream Crossings	***Kinzua Creek***					
Existing Condition	FS crossings with Limestone Surfacing	13				
	FS crossings with Non-limestone Surfacing	37				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	1	1	1	1	0
	Crossings Obliterated	0	0	0	0	0
Resulting Effect [Existing + Proposals]	FS crossings with Limestone Surfacing	14	14	14	14	13
	FS crossings with Non-limestone Surfacing	36	36	36	36	37
Miles Within 300' of Stream	***Kinzua Creek***					
Existing Condition	FS roads with Limestone	5.9				
	FS roads with Non-limestone	19.2				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	1.4	0.06	1.3	1.4	0
	New Road Construction	0	0	0	0	0
	Roads obliterated w/in 300'	0.05	0.05	0	0.05	0
Resulting Effect [Existing + Proposals]	FS roads with Limestone	7.3	6.0	7.2	7.3	5.9
	FS roads with Non-limestone	17.7	19.1	17.9	17.7	19.2

South Branch Tionesta Creek

The majority of proposed vegetative treatments are in the East Branch Tionesta Creek subwatershed. Each alternative proposes work on a minimum of nine crossings, with a maximum of 12 crossings in Alternatives 1 and 4. These crossings, currently surfaced with pit-run stone, would be mitigated by surfacing the road with limestone to further reduce potential sediment input. Under Alternative 1, three stream crossings would be decommissioned on non-system roads. These sites would be restored to their previous condition as much as possible before the crossings were constructed. The remaining alternatives do not propose any obliteration of crossings and these would still be a source of sediment delivery to streams.

The number of miles of road within 300' of a streamcourse proposed for improvement is also highest in this watershed. Alternative 1 proposes 6.0 miles of resurfacing with limestone. This would produce the largest reduction in sediment of any of the alternatives, reducing any impacts that may be occurring now from runoff. Crane Run, a state listed Exceptional Value stream, will have three stream crossings in the extreme headwaters surfaced with limestone. As for the Wilderness Trout Stream designation, the proposed activities will not affect this status.

Adding to a potential source of sediment is a 258' long skid. This will be a short, temporary use, and should not produce any significant sediment discharges that would have negative effects on a stream. In fact, it is likely there will be no discharges to a stream because of the vegetative filtering and short-term usage.

Alternative 5 would result in no improvements under this decision, thus allowing direct/indirect effects that are now occurring to continue.

Stream Crossings	***South Branch Tionesta Creek***					
Existing Condition	FS crossings with Limestone Surfacing	4				
	FS crossings with Non-limestone Surfacing	22				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	12	11	9	12	0
	Crossings Obliterated	3	0	0	0	0
Resulting Effect [Existing + Proposals]	FS crossings with Limestone Surfacing	16	15	13	16	4
	FS crossings with Non-limestone Surfacing	10	11	13	10	22
Miles Within 300' of Stream	***South Branch Tionesta Creek***					
Existing Condition	FS roads with Limestone	2.6				
	FS roads with Non-limestone	10.7				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	6	5.3	3.9	5.8	0
	Long Skid (feet)	0	0	258	0	0
	Roads obliterated w/in 300'	0.23	0.23	0	0.23	0
Resulting Effect [Existing + Proposals]	FS roads with Limestone	8.6	7.9	6.5	8.4	2.6
	FS roads with Non-limestone	4.5	5.2	6.8	4.7	10.7

Spring Creek

Land management activities are proposed in several named and unnamed subwatersheds. One stream crossing is proposed for road activity in Alternatives 1-4. This crossing, located on FR395 over Rappe Run, is currently surfaced with pit-run stone. To further reduce sediment runoff, limestone surfacing will be used. Proposed road activity within 300' of a stream are the highest for Alternative 1, at 1.1 miles. Changing the surfacing type from pit-run to limestone on the 1.1 miles will reduce current sediment input, and lessen any negative direct/indirect effects that may be occurring. There would be no improvements under Alternative 5.

Stream Crossings	***Spring Creek***					
Existing Condition	FS crossings with Limestone Surfacing	0				
	FS crossings with Non-limestone Surfacing	12				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	1	1	1	1	0
	Crossings Obliterated	0	0	0	0	0
Resulting Effect [Existing + Proposals]	FS crossings with Limestone Surfacing	1	1	1	1	0
	FS crossings with Non-limestone Surfacing	11	11	11	11	12
Miles Within 300' of Stream	***Spring Creek***					
Existing Condition	FS roads with Limestone	0				
	FS roads with Non-limestone	5.8				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	1.1	0.2	0.2	0.2	0
	New Road Construction	0	0	0	0	0
	Roads obliterated w/in 300'	0	0	0	0	0
Resulting Effect [Existing + Proposals]	FS roads with Limestone	1.1	0.2	0.2	0.2	0
	FS roads with Non-limestone	4.7	5.6	5.6	5.6	5.8

Sugar Run Watershed

Road activity is the same under Alternatives 1-4. The stream crossings, currently surfaced with pit-run stone, would be surfaced with limestone as a mitigation measure to reduce sedimentation. There are several other stream crossings planned to be used, but these have had recent roadwork and are currently surfaced with limestone.

Road activity will utilize existing roads, some of which are located within 300' of streamcourses. The 1.5 miles proposed for use under Alternatives 1-4 are currently surfaced with pit-run. These would be surfaced with limestone to mitigate potential runoff into streams. Any negative direct/indirect effects that may be occurring will be further reduced under Alternatives 1-4. However, these effects would continue under Alternative 5.

Stream Crossings	***Sugar Run***					
Existing Condition	FS crossings with Limestone Surfacing	2				
	FS crossings with Non-limestone Surfacing	6				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	4	4	4	4	0
	Crossings Obliterated	0	0	0	0	0
Resulting Effect [Existing + Proposals]	FS crossings with Limestone Surfacing	6	6	6	6	2
	FS crossings with Non-limestone Surfacing	2	2	2	2	6
Miles Within 300' of Stream	***Sugar Run***					
Existing Condition	FS roads with Limestone	1				
	FS roads with Non-limestone	3				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	1.5	1.5	1.5	1.5	0
	New Road Construction	0	0	0	0	0
	Roads obliterated w/in 300'	0	0	0	0	0
Resulting Effect [Existing + Proposals]	FS roads with Limestone	2.5	2.5	2.5	2.5	1
	FS roads with Non-limestone	1.5	1.5	1.5	1.5	3

Tionesta Creek Watershed

The two primary subwatersheds within Tionesta Creek with proposed vegetative/road treatments are Bluejay Creek and Salmon Creek. Road activities proposed in this watershed would occur within Bluejay Creek and the Salmon Creek watersheds. In Alternatives 1-4, three stream crossings are proposed for road activity. The crossings are on FR165 over Little Salmon Creek, FR222 over Slater Run, and FR392 over the headwaters of West Branch Bluejay Creek. These crossings, currently surfaced with pit-run stone, would be surfaced with limestone to reduce sedimentation.

Alternative 1 will have slightly higher estimated reduction as a result of the obliteration of 0.04 miles of road. The implementation of the actions will further reduce any negative direct/indirect effects that may be occurring. Any direct/indirect effect that may be occurring will continue under Alternative 5.

Stream Crossings	***Tionesta Creek***					
Existing Condition	FS crossings with Limestone Surfacing	3				
	FS crossings with Non-limestone Surfacing	16				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	3	3	3	3	0
	Crossings Obliterated	0	0	0	0	0
Resulting Effect [Existing + Proposals]	FS crossings with Limestone Surfacing	6	6	6	6	3
	FS crossings with Non-limestone Surfacing	13	13	13	13	16

Miles Within 300' of Stream	***Tionesta Creek***					
Existing Condition	FS roads with Limestone	2.2				
	FS roads with Non-limestone	4.8				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	1.2	1.2	1.2	1.2	0
	New Road Construction	0	0	0	0	0
	Roads obliterated w/in 300'	0.04	0	0	0	0
Resulting Effect [Existing + Proposals]	FS roads with Limestone	3.4	3.4	3.4	3.4	2.2
	FS roads with Non-limestone	3.56	3.6	3.6	3.6	4.8

West Branch Tunungwant Creek Watershed

Only one area of vegetative treatment is proposed in this watershed, and it is located in the extreme headwater section. There are no stream crossings or road activities within 300' of any streamcourse. As a result, there are no effects to water resources associated with road activities in this watershed.

West Branch Clarion River Watershed

Vegetative/road treatments are proposed in four subwatersheds within the West Branch Clarion River watershed. Road activity in this watershed includes the use of five stream crossings. These crossings are currently surfaced with pit-run stone, but would be surfaced with limestone under Alternatives 1-4. In addition, two crossings on non-system roads would be obliterated.

Roads located within 300' of a streamcourse are similar for Alternatives 1-4, as well as those proposed for obliteration. Alternatives 1 and 3 would have the highest sediment reductions. As well, Alternatives 1 and 3 propose slightly more miles of road obliteration, removing chronic sources of sediment. There would be no improvements under Alternative 5.

Stream Crossings	***West Branch Clarion River***					
Existing Condition	FS crossings with Limestone Surfacing	0				
	FS crossings with Non-limestone Surfacing	12				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	5	5	5	5	0
	Crossings Obliterated	2	2	2	2	0
Resulting Effect [Existing + Proposals]	FS crossings with Limestone Surfacing	5	5	5	5	0
	FS crossings with Non-limestone Surfacing	7	7	7	7	12

Miles Within 300' of Stream	***West Branch Clarion River***					
Existing Condition	FS roads with Limestone	0.3				
	FS roads with Non-limestone	5.6				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	1.6	1.4	1.6	1.4	0
	New Road Construction	0	0	0	0	0
	Roads obliterated w/in 300'	0.7	0.8	0.7	0.8	0
Resulting Effect [Existing + Proposals]	FS roads with Limestone	1.9	1.7	1.9	1.7	0.3
	FS roads with Non-limestone	3.3	3.6	3.3	3.6	5.6

West Branch Tionesta Creek Watershed

Land management activities are proposed in the Twomile Run subwatershed. Only one stream crossing is proposed for use in three of the alternatives. This crossing is currently on a non-system road and surfaced with pit-run stone. To mitigate sediment production, limestone surfacing will be used.

The amount of road mileage proposed for improvement within 300' of a stream are similar for Alternatives 1-4. The roads are surfaced with pit-run stone, but would be surfaced with limestone to reduce sediment runoff. Further reductions will be realized by the obliteration of 0.4 miles of road in Alternatives 1, 2 and 4. However, an increase in sediment production will result from the new construction of 0.4 miles in Alternatives 1, 2, and 4, although limestone surfacing would be used. Sedimentation rates will continue at their current rate under Alternative 5.

Stream Crossings	***West Branch Tionesta Creek***					
Existing Condition	FS crossings with Limestone Surfacing	0				
	FS crossings with Non-limestone Surfacing	3				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	1	1	0	1	0
	Crossings Obliterated	0	0	0	0	0
Resulting Effect [Existing + Proposals]	FS crossings with Limestone Surfacing	1	1	0	1	0
	FS crossings with Non-limestone Surfacing	2	2	3	2	3
Miles Within 300' of Stream	***West Branch Tionesta Creek***					
Existing Condition	FS roads with Limestone	0.8				
	FS roads with Non-limestone	0.7				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	1.2	1.1	1.0	1.1	0
	New Road Construction	0.4	0.4	0	0.4	0
	Roads obliterated w/in 300'	0.4	0.4	0	0.4	0
Resulting Effect [Existing + Proposals]	FS roads with Limestone	2.4	2.3	1.8	2.3	0.8
	FS roads with Non-limestone	0.3	0.3	0.7	0.3	0.7

Cumulative Effects

The cumulative effects analysis area is the 11 watersheds considered in the affected environment. The timeframe considered is three years for this analysis, unlike the 20 years used for other resources discussed in this document. Three years was used since the projection for road work is based only on this timeframe for each watershed. Beyond this time, road work will probably occur (as discussed in the transportation analysis), but there is uncertainty as to which watersheds this will occur within. On a watershed scale, overall road conditions will improve with limestone surfacing (see Table 32). Additional limestone surfacing potentially could occur on an additional 4.4 miles within the three year analysis period. The overall benefits will be a reduction in sedimentation in all alternatives, further reducing any effects that may be occurring to the smaller headwater, as well as the larger sized, streams. Future FS road construction activities will follow the Guidelines for Road Design in Proximity to Streams. Existing road corridors which are potential sources for sediment will continue to be evaluated to determine whether they should be rerouted, closed and seeded, or left in place and improved to reduce sedimentation. Private roads, as well as some Forest Service roads, will still make up the larger percentage of roads that are not surfaced with limestone. It is likely that additional OGM roads will be built within the watersheds and most likely will not be surfaced with limestone.

Standards and guidelines are followed when herbicide is applied or timber harvesting occurs. Therefore, no cumulative effects are anticipated from these activities.

Table 32. Summary of Cumulative Road/Water Interactions for the Eleven Watersheds

Miles Within 300'	Existing Condition	Alt. 1	Alt. 2	Alt. 3	Alt 4.	Alt. 5
FS roads with Limestone Surfacing	24.5	40	36.8	36.7	38.2	24.5
FS roads with Non-limestone Surfacing	107.5	85.8	88.3	89.1	86.4	101.6
OGM-Municipal/Other	80.3/440.6	80.3/440.6	80.3/440.6	80.3/440.6	80.3/440.6	80.3/440.6
Stream Crossings	**Existing Condition**	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
Limestone	42	70	69	66	70	42
Non-limestone	260	230	231	234	230	260
OGM-Municipal/Other	170/951	170/951	170/951	170/951	170/951	170/951

Bear Creek

Although there are no proposed road activities that will add to or reduce the current level of sediment introduction into streamcourses, there are still 5.9 miles of roads that will continue to contribute sediment at a higher rate than limestone surfaced roads. Some of these road sections could be used in the next three years for other projects, including 0.8 miles of pit-run surfaced road. These road sections would be surfaced with limestone to further reduce sediment production. Whereas no roads would be surfaced with limestone in this project, cumulatively 14% of the roads would be in the next three years.

Stream Crossings	***Bear Creek***					
Existing Condition	FS crossings with Limestone Surfacing	0				
	FS crossings with Non-limestone Surfacing	13				
	OGM-Municipal/Other	2/18				
Future Proposals						
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	0	0	0	0	0
	Crossings Obliterated	0	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS crossings with Limestone Surfacing	0	0	0	0	0
	FS crossings with Non-limestone Surfacing	13	13	13	13	13
	OGM-Municipal/Other	2/18	2/18	2/18	2/18	2/18
Miles Within 300' of Stream	***Bear Creek***					
Existing Condition	FS roads with Limestone	0				
	FS roads with Non-limestone	5.9				
	OGM-Municipal/Other	1.3/10.7				
Future Proposals	Limestone surfacing	0.8				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	0	0	0	0	0
	New Road Construction	0	0	0	0	0
	Roads obliterated w/in 300'	0	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS roads with Limestone	0.8	0.8	0.8	0.8	0.8
	FS roads with Non-limestone	5.1	5.1	5.1	5.1	5.1
	OGM-Municipal/Other	1.3/10.7	1.3/10.7	1.3/10.7	1.3/10.7	1.3/10.7

Big Mill Creek

The effects of proposed road activities, in conjunction with possible roadwork over the next three years, will result in a slight reduction in the amount of sediment currently reaching streamcourses. The application of limestone on 0.1 miles in Alternatives 1-4 will slightly reduce the amount of sedimentation. Within the next three years, an additional 0.5 miles of road within 300' of a streamcourse could be used for similar activities. The 0.5 miles, currently surfaced with pit-run material, would be surfaced with limestone to reduce sediment production. The cumulative totals are reflected in the cumulative effects table, including the projection of completing 0.5 miles of limestone surfacing within three years and summarized under each alternative.

Stream Crossings	***Big Mill Creek***					
Existing Condition	FS crossings with Limestone Surfacing	5				
	FS crossings with Non-limestone Surfacing	13				
	OGM-Municipal/Other	2/23				
Future Proposals						
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	0	0	0	0	0
	Crossings Obliterated	0	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS crossings with Limestone Surfacing	5	5	5	5	5
	FS crossings with Non-limestone Surfacing	13	13	13	13	13
	OGM-Municipal/Other	2/23	2/23	2/23	2/23	2/23
Miles Within 300' of Stream	***Big Mill Creek***					
Existing Condition	FS roads with Limestone	4.9				
	FS roads with Non-limestone	5.9				
	OGM-Municipal/Other	0.5/11.2				
Future Proposals	Limestone surfacing	0.5				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	0.09	0.09	0.09	0.09	0.09
	New Road Construction	0	0	0	0	0
	Roads obliterated w/in 300'	0	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS roads with Limestone	5.5	5.5	5.5	5.5	0.5
	FS roads with Non-limestone	5.3	5.3	5.3	5.3	5.4
	OGM-Municipal/Other	0.5/11.2	0.5/11.2	0.5/11.2	0.5/11.2	0.5/11.2

Clarion River

The proposal to surface one mile of road with limestone will reduce the amount of sediment delivery to streams in Alternatives 1-4. This reduction is insignificant on the Clarion River watershed scale, but will have more influence on the Little Mill Creek watershed where the road is located. There is no additional work planned outside of this project that would cumulatively reduce current sedimentation rates.

Stream Crossings	***Clarion River***					
Existing Condition	FS crossings with Limestone Surfacing	0				
	FS crossings with Non-limestone Surfacing	6				
	OGM-Municipal/Other	26/43				
Future Proposals						
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	1	1	1	1	0
	Crossings Obliterated	0	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS crossings with Limestone Surfacing	1	1	1	1	0
	FS crossings with Non-limestone Surfacing	5	5	5	5	6
	OGM-Municipal/Other	26/43	26/43	26/43	26/43	26/43
Miles Within 300' of Stream	***Clarion River***					
Existing Condition	FS roads with Limestone	0				
	FS roads with Non-limestone	2.7				
	OGM-Municipal/Other	16.2/20.7				
Future Proposals		0				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	1	1	1	1	0
	New Road Construction	0	0	0	0	0
	Roads obliterated w/in 300'	0	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS roads with Limestone	1	1	1	1	0
	FS roads with Non-limestone	1.7	1.7	1.7	1.7	2.7
	OGM-Municipal/Other	16.2/20.7	16.2/20.7	16.2/20.7	16.2/20.7	16.2/20.7

Kinzua Creek

Proposals for road work in Alternatives 1-4 will reduce sediment delivery to streams as displayed in the cumulative effects table. Within the next three years, an additional 2.4 miles of roads surfaced with pit-run and within 300' of a streamcourse could be surfaced with limestone, further reducing sedimentation. This amount of work is reflected for Alternatives 1-5. Alternatives 1 and 4 would result in the highest reduction, and alternative 2 the least. Approximately two-thirds of the Forest Service roads will still be producing higher amounts of sediment.

Stream Crossings	***Kinzua Creek***					
Existing Condition	FS crossings with Limestone Surfacing	13				
	FS crossings with Non-limestone Surfacing	50				
	OGM-Municipal/Other	10/80				
Future Proposals						
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	1	1	1	1	0
	Crossings Obliterated	0	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS crossings with Limestone Surfacing	14	14	14	14	13
	FS crossings with Non-limestone Surfacing	49	49	49	49	50
	OGM-Municipal/Other	10/80	10/80	10/80	10/80	10/80
Miles Within 300' of Stream	***Kinzua Creek***					
Existing Condition	FS roads with Limestone	5.9				
	FS roads with Non-limestone	21.7				
	OGM-Municipal/Other	4.4/32.1				
Future Proposals	Limestone surfacing	2.4				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	1.4	0.06	1.3	1.4	0
	New Road Construction	0	0	0	0	0
	Roads obliterated w/in 300'	0.05	0.05	0	0.05	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS roads with Limestone	9.7	8.4	9.6	9.7	8.3
	FS roads with Non-limestone	17.8	19.2	18.0	17.8	19.3
	OGM-Municipal/Other	4.4/32.1	4.4/32.1	4.4/32.1	4.4/32.1	4.4/32.1

South Branch Tionesta Creek

The amount of limestone surfacing proposed in Alternatives 1-4 will result in a significant reduction in sediment delivery. The amounts vary by alternative, but all will result in more than doubling the amount of higher quality surfaced roads in these more sensitive locations. In fact, more ANF roads will be surfaced with limestone than pit-run under Alternatives 1, 2, and 4. This would further reduce any impacts from runoff now occurring in the watershed. Cumulatively, there are currently no proposals for additional surfacing with limestone within the next three years.

Stream Crossings	***South Branch Tionesta Creek***					
Existing Condition	FS crossings with Limestone Surfacing	5				
	FS crossings with Non-limestone Surfacing	22				
	OGM-Municipal/Other	31/82				
Future Proposals						
		Alt. 1	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
East Side Proposals	Crossings Used & Limestoned	12	11	9	12	0
	Crossings Obliterated	3	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS crossings with Limestone Surfacing	17	16	14	17	5
	FS crossings with Non-limestone Surfacing	10	11	13	10	22
	OGM-Municipal/Other	31/82	31/82	31/82	31/82	31/82
Miles Within 300' of Stream	***South Branch Tionesta Creek***					
Existing Condition	FS roads with Limestone	2.9				
	FS roads with Non-limestone	11.8				
	OGM-Municipal/Other	10.4/40.5				
Future Proposals		0				
		Alt. 1	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
East Side Proposals	Roads Used w/in 300' & Limestoned	6	5.3	3.9	5.8	0
	Long Skidding			258'		
	Roads obliterated w/in 300'	0.23	0.23	0	0.23	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS roads with Limestone	8.9	8.2	6.8	8.7	2.9
	FS roads with Non-limestone	5.6	6.3	7.9	5.8	11.8
	OGM-Municipal/Other	10.4/40.5	10.4/40.5	10.4/40.5	10.4/40.5	10.4/40.5

Spring Creek

On the watershed scale, a slight increase in the miles of road surfaced with limestone will occur in Alternatives 1-4, further reducing sedimentation. Alternative 1 will realize the largest increase. However, a higher percentage of Forest Service roads will still remain in a higher sediment producing capacity. Cumulatively, there is no additional roads planned for limestone surfacing with the next three years.

Stream Crossings	***Spring Creek***					
Existing Condition	FS crossings with Limestone Surfacing	2				
	FS crossings with Non-limestone Surfacing	40				
	OGM-Municipal/Other	16/68				
Future Proposals						
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	1	1	1	1	0
	Crossings Obliterated	0	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS crossings with Limestone Surfacing	3	3	3	3	2
	FS crossings with Non-limestone Surfacing	39	39	39	39	40
	OGM-Municipal/Other	16/68	16/68	16/68	16/68	16/68
Miles Within 300' of Stream	***Spring Creek***					
Existing Condition	FS roads with Limestone	1.1				
	FS roads with Non-limestone	15.8				
	OGM-Municipal/Other	8.9/37.7				
Future Proposals		0				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	1.1	0.2	0.2	0.2	0
	New Road Construction	0	0	0	0	0
	Roads obliterated w/in 300'	0	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS roads with Limestone	2.2	1.3	1.3	1.3	1.1
	FS roads with Non-limestone	14.7	15.6	15.6	15.6	15.8
	OGM-Municipal/Other	8.9/37.7	8.9/37.7	8.9/37.7	8.9/37.7	8.9/37.7

Sugar Run Watershed

The number of ANF roads surfaced with limestone will increase by 1.5 miles in Alternatives 1-4. That same amount of sandstone-surfaced roads will be reduced. This will reduce the overall sedimentation rate that is currently occurring. Additionally, 0.7 miles could be mitigated in the next three years with other projects, and is reflected in the cumulative effects table for all alternatives.

Stream Crossings	***Sugar Run***					
Existing Condition	FS crossings with Limestone Surfacing	2				
	FS crossings with Non-limestone Surfacing	14				
	OGM-Municipal/Other	0/13				
Future Proposals						
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	4	4	4	4	0
	Crossings Obliterated	0	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS crossings with Limestone Surfacing	6	6	6	6	2
	FS crossings with Non-limestone Surfacing	10	10	10	10	14
	OGM-Municipal/Other	0/13	0/13	0/13	0/13	0/13
Miles Within 300' of Stream	***Sugar Run***					
Existing Condition	FS roads with Limestone	1.0				
	FS roads with Non-limestone	5.8				
	OGM-Municipal/Other	0/6				
Future Proposals	FS road to be limestoned	0.7				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	1.5	1.5	1.5	1.5	0
	New Road Construction	0	0	0	0	0
	Roads obliterated w/in 300'	0	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS roads with Limestone	3.2	3.2	3.2	3.2	1.7
	FS roads with Non-limestone	3.6	6.6	6.8	6.8	5.1
	OGM-Municipal/Other	0/6	0/6	0/6	0/6	0/6

Tionesta Creek Watershed

Over 25 miles of ANF roads are within 300' of a streamcourse. Currently (Alternative 5), about one-third of the roads are surfaced with limestone. That number would increase to over 40% under Alternatives 1-4. This would further reduce sedimentation from these roads. Cumulatively, no additional roads have been identified for surfacing with limestone within the next three years.

Stream Crossings	***Tionesta Creek***					
Existing Condition	FS crossings with Limestone Surfacing	8				
	FS crossings with Non-limestone Surfacing	65				
	OGM-Municipal/Other	27/206				
Future Proposals						
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	3	3	3	3	0
	Crossings Obliterated	0	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS crossings with Limestone Surfacing	11	11	11	11	8
	FS crossings with Non-limestone Surfacing	62	62	62	62	65
	OGM-Municipal/Other	27/206	27/206	27/206	27/206	27/206
Miles Within 300' of Stream	***Tionesta Creek***					
Existing Condition	FS roads with Limestone	6.3				
	FS roads with Non-limestone	19.3				
	OGM-Municipal/Other	11.5/95.8				
Future Proposals		0				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	1.2	1.2	1.2	1.2	0
	New Road Construction					
	Roads obliterated w/in 300'	0.04	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS roads with Limestone	7.5	7.5	7.5	7.5	6.3
	FS roads with Non-limestone	18.1	18.1	18.1	18.1	19.3
	OGM-Municipal/Other	11.5/95.8	11.5/95.8	11.5/95.8	11.5/95.8	11.5/95.8

Tunungwant Creek Watershed

The ANF has approximately 400' of road in close proximity to a streamcourse in this watershed. On a watershed scale, this small percentage (<1%) does not have any significant effects.

Stream Crossings	***Tunungwant Creek***					
Existing Condition	FS crossings with Limestone Surfacing	0				
	FS crossings with Non-limestone Surfacing	0				
	OGM-Municipal/Other	26/87				
Future Proposals						
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	0	0	0	0	0
	Crossings Obliterated	0	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS crossings with Limestone Surfacing	0	0	0	0	0
	FS crossings with Non-limestone Surfacing	0	0	0	0	0
	OGM-Municipal/Other	0	0	0	0	0
Miles Within 300' of Stream	***Tunungwant Creek***					
Existing Condition	FS roads with Limestone	0				
	FS roads with Non-limestone	0.1				
	OGM-Municipal/Other	9.6/37				
Future Proposals						
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	0	0	0	0	0
	New Road Construction	0	0	0	0	0
	Roads obliterated w/in 300'	0	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS roads with Limestone	0	0	0	0	0
	FS roads with Non-limestone	0.1	0.1	0.1	0.1	0.1
	OGM-Municipal/Other	9.6/37.1	9.6/37.1	9.6/37.1	9.6/37.1	9.6/37.1

West Branch Clarion River Watershed

Higher yields of sediment coming from roads without limestone would be reduced under Alternatives 1-4. Cumulatively, the miles of roads with limestone surfacing would increase under Alternatives 1-4, while those roads without would decrease. In addition, road obliteration would contribute to less miles within 300' of a streamcourse, thereby further decreasing sediment amounts. The actions taken under any of the four action alternatives would likely contribute to an improvement over current conditions. There are no current plans to surface additional roads with limestone in the next three years.

Stream Crossings	***West Branch Clarion River***					
Existing Condition	FS crossings with Limestone Surfacing	0				
	FS crossings with Non-limestone Surfacing	11				
	OGM-Municipal/Other	15/162				
Future Proposals						
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	5	5	5	5	0
	Crossings Obliterated	2	2	2	2	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS crossings with Limestone Surfacing	5	5	5	5	0
	FS crossings with Non-limestone surfacing	4	4	4	4	11
	OGM-Municipal/Other	15/162	15/162	15/162	15/162	15/162
Miles Within 300' of Stream	***West Branch Clarion River***					
Existing Condition	FS roads with Limestone	0.3				
	FS roads with Non-limestone	8.0				
	OGM-Municipal/Other	8.3/81.2				
Future Proposals		0				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300’ & Limestoned	1.6	1.4	1.6	1.4	0
	New Road Construction	0	0	0	0	0
	Roads obliterated w/in 300’	0.7	0.8	0.7	0.8	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS roads with Limestone	1.9	1.7	1.9	1.7	0.3
	FS roads with Non-limestone	5.7	5.8	5.7	5.8	8.0
	OGM-Municipal/Other	8.3/81.2	9.3/81.2	8.3/81.2	8.3/81.2	8.3/81.2

West Branch Tionesta Creek Watershed

Overall cumulative effects in this watershed should be an improvement in aquatic conditions as a result of an increase in the miles surfaced with limestone and a decrease in miles of roads surfaced with a non-limestone surfacing (Alternatives 1-4). However, there will still be over six miles contributing higher amounts of sediment from non-limestone surfaced ANF roads, in addition to the 5.6 miles of private roads. Cumulatively, there are no proposals for surfacing additional roads with limestone in the next three years.

Stream Crossings	***West Branch Tionesta Creek***					
Existing Condition	FS crossings with Limestone Surfacing	7				
	FS crossings with Non-limestone Surfacing	22				
	OGM-Municipal/Other	10/169				
Future Proposals						
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Crossings Used & Limestoned	1	1	1	1	0
	Crossings Obliterated	0	0	0	0	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS crossings with Limestone Surfacing	8	8	8	8	7
	FS crossings with Non-limestone Surfacing	21	21	21	21	22
	OGM-Municipal/Other	10/169	10/169	10/169	10/169	10/169
Miles Within 300' of Stream	***West Branch Tionesta Creek***					
Existing Condition	FS roads with Limestone	2.1				
	FS roads with Non-limestone	7.8				
	OGM-Municipal/Other	5.2/67.5				
Future Proposals		0				
East Side Proposals		**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
	Roads Used w/in 300' & Limestoned	1.2	1.1	1	1.1	0
	New Road Construction	0.4	0.4	0	0.4	0
	Roads obliterated w/in 300'	.04	0.4	0	0.4	0
Resulting Cumulative Effect [Existing+Future+Proposed]	FS roads with Limestone	3.7	3.6	3.1	3.6	2.1
	FS roads with Non-limestone	6.2	6.3	6.8	6.3	7.8
	OGM-Municipal/Other	5.2/67.5	5.2/67.5	5.2/67.5	5.2/67.5	5.2/67.5

Summary of Mitigation Measures and Effectiveness

A variety of mitigation measures (or best management practices) will be implemented to reduce the effects of the proposed activities. These mitigation measures will be implemented on critical road locations and stream crossings to reduce sediment to streamcourses. Mitigation measures addressing vegetative management will be implemented to insure fish habitat, water quality, and stream morphology are maintained at current levels. See Appendix D-Mitigation Measures for a listing, and the areas (stands) where any site-specific measures are to be applied. The effectiveness of these measures are based upon previous monitoring efforts as disclosed in environmental consequences.

Transportation

Affected Environment

Within the East Side Project Area, there is an established system of State, Township, Forest, OGM, and private roads that have developed over the past 100 years. Roads provide access to areas by motorized vehicles; allow for resource management such as timber harvest and OGM activity; and make access easier for pedestrian traffic, mountain biking, and cross country skiing. At the same time, roads reduce solitude by their use, increase potential sedimentation, reduce canopy closure and possibly increase fragmentation of the forest (see Biological Section, Wildlife Habitat), and take land out of production.

The affected environment is described in terms of road density and road management. These two items also serve as indicators of the consequences of implementing alternatives. Additional background information for roads within the project area such as traffic service level, road standard, and road management on each individual road are housed within our Geographic Information System.

Road Density

Road density is the number of road miles per area of land. This measurement is included as an indicator of effects because the underlying assumption is that as road density increases, both the impact of the transportation system on the environment and the cost of maintaining the road system increases.

The Forest Plan provides a density standard for the Forest Service road system for most Management Areas. Table 33 indicates (1) the Forest Plan standard for FS road densities and (2) the existing road and trail densities by management areas for various categories of roads and trails within the East Side Project Area. There is great variation in the density of roads and trails depending upon which are being considered. The ***all roads with no trails*** category would include state, township, FS, OGM, private, and non-system roads. It is interesting to note that there are more miles of ***trails on roads*** than miles of trail that are ***only trail***. Every effort is made to utilize existing corridors on acceptable locations. Trails (i.e. ATV or Snowmobile) are often located on existing roads, and OGM roads are often utilized for Forest Service management practices. This indicates a high degree of efficiency of corridors for dual purposes on FS administered land. For *FS roads only* and *FS roads with OGM roads on system*, densities are within Forest Plan standards. The "total" row is included to show the overall effect of road densities. For example, Management area 7 has a very high road density. This is in line with Forest Plan direction (Plan p4-161) for providing a high-density, recreation development in a rural setting. While the density appears out of line, when these areas are included in larger project areas their impact becomes negligible.

Table 33. Existing Conditions: Road Density by Management Area for Various Road and Trail Categories

# of Acres Within East Side Project Area	Management Area (MA)	Forest Plan Standard	All roads-- no trails	FS roads only[5]	FS roads with OGM roads on system [6]	Trails on Roads	Trails only
28,206	Private	NA	4.1	0.3 [7]	0.3	0.2	0.1
1,638	2	2 to 4	4.5	2.4	2.9	0.0	0.6
115,983	3	2 to 4	3.5	2.1	2.1	0.6	0.4
10,537	6.1	1 to 3	2.6	2.0	2.1	0.9	0.5
5,778	6.2	1.5 to 4	2.8	1.9	1.9	0.0	1.4
280	7	NA	16.6	15.9	15.9	3.0	1.3
5,774	8	NA	1.0	0.1	0.1	0.0	0.5
168,196	Total	NA	3.5	2.1	2.1	0.6	0.5

Road Management

Road management primarily refers to the management and control of the use of Forest development roads in order to prevent damage to the roadway, abate unsafe traffic conditions, limit the use of vehicles that exceed design capacity, or to meet specific management direction such as protecting wildlife or achieving semi-primitive recreation objectives. All of these factors influence public and administrative use of an area of land.

Traffic Service Levels (TSL) are used to describe the significant traffic characteristics and operating conditions of roads. There are four TSL's used on the ANF: TSL A, TSL B, TSL C, and TSL D. Table 3-2, page 3-13 of the Forest Plan FEIS describes the road operational characteristics for each TSL. "D" level roads are considered the lowest standard Forest development road and are generally closed after resource management needs are met. In the East Side project area, many of the roads are considered TSL D roads. Please refer to Table 34 for the miles of each TSL in the various road and trail categories.

Table 34. Existing Conditions: Miles of each TSL for various road and trail categories

TSL	All roads-- no trails	FS roads only	FS roads with OGM roads on system	Trails on Roads
A	62.9	0.0	0.0	1.1
B	52.3	24.8	25.0	26.2
C	294.5	252.3	259.9	75.6
D	185.7	176.3	182.3	19.5
Unknown	0.0	0.0	0.0	8.6
Total	911.6	453.4	467.2	131.0

[5] *Roads constructed by the Forest Service.*
[6] *Roads constructed by the Forest Service as well as roads constructed by OGM that have needed reconstruction for Forest Service resource management activities.*
[7] *Forest Service roads on Private land that the FS has a ROW for.*

There are three basic road management strategies on the ANF: open, closed and restricted. Open roads are Forest roads that are open year round to public motorized traffic; closed roads are Forest roads that are closed year round to public motorized traffic; and restricted roads are Forest roads that are open part of the year and closed part of the year to public motorized traffic. The Forest Plan provides guidance on the long-term objective (50 year) for road management for the Forest Service road system. Long-term, the objective is to have 60% of the Forest roads closed and twenty percent each open and restricted. Table 35 identifies the existing condition for the East Side project. Presently, the project area does not meet the long-term objectives.

Table 35. Percentage of FS Roads by Road Management Objective for the Existing Condition.

Road Management	Forest Plan Standard	Existing Condition
Open	20%	37%
Closed	60%	32%
Restricted	20%	31%
Total	100%	100%

Environmental Consequences

Direct/Indirect Effects

The Forest Plan directs that when planning a road system, if the MA objectives and the environmental constraints can be met, existing road corridors should be taken advantage of in order to minimize additional land clearing. This also minimizes soil and watershed impacts. Therefore, the strategy used in route selection for resource management with the East Side project was to balance optimized locations with existing access corridors. Several OGM roads are included in the transportation planning for the action alternatives as well as those FS road segments that also function as trails. Any effects to "trails on roads" are disclosed in the Recreation section under the Socio-Economic factors. Changes in landform, productivity, or water quality are discussed within the Landform and Watershed resource sections, Physical Environment.

Table 36 was developed to display the changes in road activity by alternative, the estimated average additional clearing needed, and the map code by road segment. This table can be interpreted as follows:

- The *Existing Road #* column indicates the identifying number of an existing road. Existing roads are roads presently on the Forest Service or township road system. If this column is blank, it indicates that either the road does not exist or that the road is not on the Forest Service or Township road system.

- The *New Road Number* column indicates the proposed road number for any road to be added to the Forest Service road system. If the road is new construction, it will be identified in the road activity column as new construction. If it is an existing road, not presently on any system, it will be identified in the road activity column as either betterment or restoration, depending on the current condition and

standard of the road segment. For those roads proposed for decommissioning, they will be identified as "decomXX" in the new road number column and identified as "decommissioning" in the road activity column.

- The *Road Activity* column identifies the typical road activity for that segment of road. This is the road activity displayed on the Index Maps. The following definitions apply:

  New Road Construction -- (new const.) Investment in construction of a road that results in a new road corridor.

  Road Reconstruction -- The investment in construction activity that results in betterment, restoration, or in the realignment of a road as defined below:

    Realignment -- Investment in construction activity that results in the new location of an existing road or portions thereof (FSM 7705).

    Betterment -- Investment in construction activity that raises the traffic service level of a road or improves its safety or operating efficiency (FSM 7705).

    Restoration -- Investment in construction activity required to rebuild a road to its approved traffic service level (FSM 7705).

  Long Skid – When the travelway used to drag or transport trees from the stump to the road is greater than ½ mile. Typically, this will require a constructed skid trail with some earth moving activities and restoration.

  Road Decommissioning – (decomm.) Activities that terminate the function of a road.

  In some cases, the proposed road activity changes by segment. These are easily identified by comparing the Alt # Road Activity columns. Where no activity is indicated for a road segment in an alternative, the column is blank. As an example, there are two segments identified as FR446.1. The first one listed (1.21 miles long) will be restored in Alternatives 1, 3 and 4. The second segment (0.41 miles long) will only be restored in Alternatives 1 and 3.

- The *Estimated Average Clearing* column indicates an estimate of the amount of additional clearing required on that road segment for the proposed activity. This is an average figure. During the road design process, actual clearing limits will be marked on the ground and will vary, depending on side-slope, turnout location, curve widening, parking areas, etc. Some scattered clearing will occur on roads undergoing restoration. This clearing will be for safety, additional turnouts, and parking areas. This clearing will be minor in nature, for example, possibly removing five trees for a turnout or two trees for safety.

- The *Map Code* column indicates the section and location index where the beginning of each road is located.

- The *Notes* column provides some further discussion of each road segment. Unless indicated otherwise in this column, any road segment being constructed, realigned, reconstructed (betterment), or reconstructed (restoration) will be done so to a Traffic Service Level (TSL) “D” standard (USDA-FS 1986, Forest Plan FEIS, p.3-12 to p. 3-16).

Table 36. Road Activity /Estimated Clearing/ Map Code and Notes by Road Segment by Alternative

Existing Road	New Road #s	Alt 1 Road Activity	Alt 2 Road Activity	Alt 3 Road Activity	Alt 4 Road Activity	Est. Ave. Clearing Width (feet)	Map Code	Segment Length (Miles)	Notes
	decom01	decomm.				0	F-14	0.68	access provided by FR222D
	decom02	decomm.	decomm.	decomm.	decomm.	0	N-13	0.29	access not needed
	decom03	decomm.	decomm.	decomm.	decomm.	0	N-13	0.49	access not needed
	decom04	decomm.	decomm.	decomm.	decomm.	0	N-13	0.30	access not needed
	decom05	decomm.				0	K-10	0.46	access not needed
	decom06	decomm.				0	K-10	0.25	OGM road to be realigned as FR476C
	decom07	decomm.				0	J-10	0.28	access not needed
	decom09	decomm.				0	J-9	0.21	access not needed
	decom10	decomm.	decomm.		decomm.	0	J-9	0.31	OGM road to be realigned as FR126C
	decom11	decomm.				0	J-9	0.19	OGM road to be realigned as FR423A
	decom12	decomm.	decomm.		decomm.	0	J-9	0.23	OGM road to be realigned as FR529
	decom13	decomm.	decomm.	decomm.	decomm.	0	J-8	0.18	access not needed
	decom14	decomm.	decomm.	decomm.	decomm.	0	J-8	0.36	access not needed
	decom15	decomm.				0	K-8	0.16	access not needed
	decom16	decomm.	decomm.		decomm.	0	K-9	0.22	OGM road to be realigned as FR538A
	decom17	decomm.				0	K-9	0.29	access not needed
	decom19	decomm.	decomm.	decomm.	decomm.	0	K-9	0.39	access not needed
	decom20	decomm.	decomm.		decomm.	0	L-9	0.23	access not needed
	decom21	decomm.	decomm.		decomm.	0	K-7	0.31	OGM road to be realigned as FR665
	decom22	decomm.	decomm.		decomm.	0	K-7	0.33	access not needed
	decom23	decomm.	decomm.		decomm.	0	K-7	0.26	OGM road to be realigned as FR665
	decom24	decomm.	decomm.		decomm.	0	J-7	0.20	access not needed
EJO359		restoration	restoration	restoration	restoration	0	N-12	4.00	township road- limestone, culverts, inter. with FR123, off road parking
	FR125A	betterment		long skid	betterment	0	I-14	0.41	abandoned OGM road- surfacing, culverts, gate at both ends

Existing Road	New Road #s	Alt 1 Road Activity	Alt 2 Road Activity	Alt 3 Road Activity	Alt 4 Road Activity	Est. Ave. Clearing Width (feet)	Map Code	Segment Length (Miles)	Notes
	FR125A	betterment				0	I-14	0.75	abandoned OGM road- surfacing, culverts
	FR125Ab	betterment		long skid	betterment	0	I-14	0.03	abandoned OGM road- surfacing, culverts
	FR125Ac	betterment		long skid	betterment	0	I-14	0.19	abandoned OGM road- surfacing, culverts
FR126		restoration	restoration	restoration	restoration	0	J-9	1.63	northern end, convert section on private to township road, TSL "C"
FR126		realignment	realignment		realignment	30	J-10	0.23	new location of section realigned, TSL "C"
FR126	decom08	decomm.	decomm.	restoration	decomm.	0	J-10	0.23	section along stream - realigned to new location
FR126		restoration	restoration	restoration	restoration	2	J-10	1.80	southern end - near FR133- limestone, culverts, turnouts, TSL "C"
	FR126C	betterment	betterment		betterment	5	J-9	0.40	existing OGM road - clearing, template, surfacing, culverts
	FR126C	betterment				5	K-10	0.35	existing OGM road - clearing, template, surfacing, culverts, gate
	FR126C	new const.	new const.		new const.	30	J-9	0.16	gated at beginning of road
	FR126Cb	new const.				30	J-9	0.27	gated on FR126C
FR133.3		restoration	restoration		restoration	0	I-9	1.04	section near Hoffman Farm - limestone, culverts, turnouts, TSL "C"
FR133.4		restoration	restoration	restoration	restoration	0	J-11	2.59	section near JoJo - limestone, culverts, turnouts, TSL "C"
FR134		restoration	restoration	restoration	restoration	0	L-14	1.45	surfacing, culverts
FR134C		restoration	restoration	restoration	restoration	0	L-15	0.48	surfacing, culverts
FR143C		restoration	restoration	restoration	restoration	0	M-15	0.27	surfacing, culverts
FR148		restoration		restoration	restoration	0	G-11	0.22	surfacing, culverts, TSL "C"
FR165		restoration	restoration	restoration	restoration	0	C-16	2.03	surfacing, culverts, TSL "C"

Existing Road	New Road #s	Alt 1 Road Activity	Alt 2 Road Activity	Alt 3 Road Activity	Alt 4 Road Activity	Est. Ave. Clearing Width (feet)	Map Code	Segment Length (Miles)	Notes
FR176A		restoration	restoration	restoration	restoration	0	M-2	2.04	surfacing, culverts, TSL “C”
FR182		restoration	restoration	restoration	restoration	0	M-2	1.90	surfacing, culverts, TSL “C”
FR185		restoration	restoration	restoration	restoration	0	N-13	5.23	surfacing, culverts, TSL “C”
FR185E		restoration	restoration	restoration	restoration	0	N-13	0.83	surfacing, culverts
FR195.1		restoration	restoration	restoration	restoration	0	J-11	4.55	surfacing, culverts, TSL “C”
FR222.1		restoration	restoration	restoration	restoration	0	F-14	4.68	surfacing, culverts
	FR222C	new const.			new const.	30	E-14	0.55	barricade when use completed
	FR222D	betterment	betterment	long skid	betterment	5	F-14	0.29	surfacing, culverts, turnouts, widening, clearing, replace barricade when use completed
	FR222D	betterment				5	F-14	0.27	surfacing, culverts, turnouts, widening, clearing
	FR225	betterment			betterment	0	H-14	0.49	existing ATV trail - convert to road for dual use
FR225.1		restoration	restoration	restoration	restoration	0	H-13	0.30	surfacing, culverts
FR225.1		restoration			restoration	0	H-13	0.32	surfacing, culverts
FR237		restoration	restoration	restoration	restoration	0	L-15	4.06	surfacing, culverts, TSL “C”
FR237		restoration		restoration		0	L-15	0.76	surfacing, culverts, TSL “C”
FR237F		restoration	restoration	restoration	restoration	0	L-15	1.81	surfacing, culverts
FR237F		new const.	new const.		new const.	30	M-15	0.26	existing system road, only cleared, no template
FR243.1		restoration	restoration	restoration	restoration	0	K-9	1.39	section thru private land- limestone, culverts, TSL “C”, construct 3-5 car parking area near gate
	FR243	realignment	realignment		realignment	30	K-8	0.37	new location of section realigned
FR243.1	decom18	decomm.	decomm.	restoration	decomm.	0	K-8	0.35	section thru pines - realigned to new location, TSL “C”
FR243A		restoration	restoration	restoration	restoration	0	K-8	0.54	surfacing, culverts
	FR243A	restoration	restoration	restoration	restoration	0	K-8	0.14	surfacing, culverts

Existing Road	New Road #s	Alt 1 Road Activity	Alt 2 Road Activity	Alt 3 Road Activity	Alt 4 Road Activity	Est. Ave. Clearing Width (feet)	Map Code	Segment Length (Miles)	Notes
	FR243A	new const.	new const.		new const.	30	K-8	1.26	gate, closed, open for hunting if needed
	FR243Aa	betterment				5	K-8	0.30	existing OGM road - clearing, template, surfacing, culverts, gate
	FR243Ab	betterment	betterment	long skid	betterment	5	K-8	0.68	existing snowmobile trail- convert to road for dual use, gate
	FR243Ab	betterment	betterment		betterment	5	K-9	0.23	existing snowmobile trail- convert to road for dual use
	FR243Ab	new const.	new const.		new const.	30	K-8	0.21	barricade when use completed
	FR243Ac	new const.	new const.		new const.	30	K-8	0.46	barricade when use completed
FR264		restoration	restoration	restoration	restoration	0	J-11	1.24	surfacing, culverts, TSL “C”
FR264A		restoration	restoration	restoration	restoration	0	J-11	0.56	surfacing, culverts
FR264B		restoration	restoration	restoration	restoration	0	J-11	0.27	surfacing, culverts
FR264D		restoration	restoration	restoration	restoration	0	J-11	0.25	surfacing, culverts
FR276		restoration	restoration	restoration	restoration	0	J-11	0.40	surfacing, culverts, replace barricade when done with use
FR278.1		restoration		restoration	restoration	0	N-7	0.64	surfacing, culverts
FR278A		restoration		restoration	restoration	0	N-7	0.51	surfacing, culverts
FR278B		restoration		restoration	restoration	0	0-7	0.36	surfacing, culverts
FR285.1		restoration	restoration	restoration	restoration	0	L-12	0.75	surfacing, culverts, TSL “C”
FR317.1		restoration	restoration	restoration	restoration	0	O-7	2.84	surfacing, culverts, TSL “C”
	FR317.1	restoration	restoration	restoration	restoration	0	N-6	0.08	existing OGM road - surfacing, culverts
	FR325C	betterment	betterment	restoration	betterment	5	K-11	0.40	existing road - clearing, template, surfacing, culverts, gate
FR339		restoration	restoration	restoration	restoration	0	L-15	0.05	surfacing, culverts, TSL “C”
FR339		restoration		restoration		0	L-15	1.71	surfacing, culverts, TSL “C”
FR340.1		restoration	restoration	restoration	restoration	0	N-14	1.20	surfacing, culverts, TSL “C”
FR340.2		new const.	new const.	long skid	new const.	30	N-13	0.13	misclassified - should be restoration

Existing Road	New Road #s	Alt 1 Road Activity	Alt 2 Road Activity	Alt 3 Road Activity	Alt 4 Road Activity	Est. Ave. Clearing Width (feet)	Map Code	Segment Length (Miles)	Notes
FR340A		restoration	restoration	restoration	restoration	0	N-14	0.33	surfacing, culverts
	FR340A	restoration	restoration	restoration	restoration	0	N-14	0.19	existing OGM road - surfacing, culverts
FR340B		restoration	restoration	restoration	restoration	0	N-14	0.42	surfacing, culverts
FR340C		new const.	new const.	long skid	new const.	30	N-13	0.31	existing system road, only cleared, no template, barricade when use completed
FR340D		restoration	restoration	restoration	restoration	0	N-14	0.62	surfacing, culverts
FR341		restoration			restoration	0	M-14	0.35	surfacing, culverts
FR341		new const.			new const.	30	M-14	0.19	misclassified - proposed road that shows as existing in inventory.
FR385A		restoration	restoration		restoration	0	M-15	0.91	surfacing, culverts
FR385B		restoration	restoration	restoration	restoration	0	M-15	0.19	surfacing, culverts
FR385E		restoration	betterment		betterment	0	M-14	0.29	surfacing, culverts
FR392		restoration	restoration	restoration	restoration	0	D-14	0.57	surfacing, culverts
FR395.1		restoration	restoration	restoration	restoration	0	G-14	2.59	surfacing, culverts, TSL “C”
FR395.3		restoration				0	G-14	0.81	surfacing, culverts
FR395A		restoration	restoration	restoration	restoration	0	G-14	0.50	surfacing, culverts
FR395A		restoration		restoration		0	G-14	0.74	surfacing, culverts
	FR395A	new const.				30	G-14	0.37	barricade when use completed
FR395C		restoration	restoration	restoration	restoration	0	H-14	0.93	surfacing, culverts
FR395D		restoration			restoration	0	G-15	0.37	surfacing, culverts
	FR395D	new const.				30	G-15	1.19	gate, closed, open for hunting if needed
	FR395Dc	new const.				30	G-15	0.26	closed with FR395D gate, open for hunting if needed
	FR395F	betterment				5	G-14	0.25	existing road - clearing, template, surfacing, culverts
	FR395F	new const.				30	G-14	0.26	barricade when use completed

Existing Road	New Road #s	Alt 1 Road Activity	Alt 2 Road Activity	Alt 3 Road Activity	Alt 4 Road Activity	Est. Ave. Clearing Width (feet)	Map Code	Segment Length (Miles)	Notes
FR396		restoration	restoration	restoration	restoration	0	H-14	1.52	surfacing, culverts, TSL “C”
	FR396	restoration	restoration	restoration	restoration	0	H-14	0.28	existing ATV trail- convert to road for dual use
	FR396	new const.	new const.	long skid	new const.	5	H-14	0.50	barricade when use completed
FR396A.1		restoration	restoration	restoration	restoration	0	H-14	1.15	surfacing, culverts, TSL “C”
	FR396Ac	betterment				5	H-14	0.12	existing road - clearing, template, surfacing, culverts
	FR396Ac	new const.				30	H-14	0.24	barricade when use completed
	FR396B	restoration	restoration	restoration	restoration	0	H-14	0.23	existing OGM road - surfacing, culverts
	FR396Ba	restoration	restoration	restoration	restoration	0	H-14	0.22	existing OGM road - surfacing, culverts
	FR396C	new const.	new const.		new const.	30	H-14	0.31	barricade when use completed
FR398.1		restoration	restoration	restoration	restoration	0	J-12	0.37	surfacing, culverts
FR398.1		restoration	restoration		restoration	0	H-15	0.20	surfacing, culverts
	FR423	betterment	betterment		betterment	5	J-9	0.73	existing OGM road - clearing, template, surfacing, culverts
	FR423	new const.	new const.		new const.	30	J-9	0.10	
	FR423A	betterment		long skid		5	J-9	0.63	existing OGM road - clearing, template, surfacing, culverts, gate
	FR423C	betterment	betterment		betterment	5	J-9	0.52	existing OGM road - clearing, template, surfacing, culverts
	FR423D	betterment	betterment		betterment	5	J-9	0.12	existing OGM road - clearing, template, surfacing, culverts
	FR423D	new const.	new const.		new const.	30	J-9	0.24	
FR435		restoration	restoration	restoration	restoration	0	M-3	2.47	surfacing, culverts, TSL “C”
FR446.1		restoration		restoration	restoration	0	H-11	1.21	surfacing, culverts, TSL “C”
FR446.1		restoration		restoration		0	H-11	0.41	surfacing, culverts, TSL “C”
FR458		restoration	restoration	restoration	restoration	0	N-13	0.87	surfacing, culverts, TSL “C”

Existing Road	New Road #s	Alt 1 Road Activity	Alt 2 Road Activity	Alt 3 Road Activity	Alt 4 Road Activity	Est. Ave. Clearing Width (feet)	Map Code	Segment Length (Miles)	Notes
FR458		restoration	decomm.	restoration	decomm.	0	N-13	0.53	surfacing, culverts, alt 2 and 4 decommission
FR458A		restoration	restoration	restoration	restoration	0	N-13	0.38	surfacing, culverts
FR462		restoration	restoration	restoration	restoration	0	J-11	1.32	surfacing, culverts
FR465			restoration		restoration	0	K-12	0.61	surfacing, culverts
FR468		restoration	restoration	restoration	restoration	0	J-8	0.22	limestone, culverts, TSL “C”
FR468		restoration	restoration		restoration	0	I-8	1.43	surfacing, culverts, TSL “C”
FR468A		restoration	restoration	restoration	restoration	0	I-8	0.31	surfacing, culverts
	FR468Aa	betterment	betterment	restoration	betterment	5	I-9	0.28	existing road - clearing, template, surfacing, culverts, gate
	FR468Aa	betterment	betterment		betterment	5	I-9	0.10	existing road - clearing, template, surfacing, culverts
	FR468Aa	new const.	new const.		new const.	30	I-9	0.47	
FR471		restoration	restoration	restoration	restoration	0	K-11	0.32	surfacing, culverts, gate
FR473		restoration	restoration	restoration	restoration	0	K-10	2.86	surfacing, culverts, gate at end, TSL “C”
	FR473C	betterment	betterment		betterment	5	K-10	0.44	existing road - clearing, template, surfacing, culverts
	FR473C	new const.			new const.	30	K-10	0.25	
	FR476	new const.				30	K-9	0.26	
FR476.1		restoration	restoration	restoration	restoration	2	J-9	1.51	surfacing, culverts, move gate, TSL “C”, construct 3-5 car parking area near gate
	FR476A	restoration				0	K-9	0.04	existing road - surfacing, culverts
	FR476A	betterment				5	K-9	0.64	existing OGM road - clearing, template, surfacing, culverts, gate
	FR476C	betterment				5	K-10	0.28	existing OGM road - clearing, template, surfacing, culverts, gate
	FR476C	realignment				30	K-10	0.31	new location of section realigned

Existing Road	New Road #s	Alt 1 Road Activity	Alt 2 Road Activity	Alt 3 Road Activity	Alt 4 Road Activity	Est. Ave. Clearing Width (feet)	Map Code	Segment Length (Miles)	Notes
	FR476C	new const.				30	J-10	0.24	
	FR476Ca	betterment				5	J-10	0.21	existing OGM road - clearing, template, surfacing, culverts
FR498		restoration	restoration	restoration	restoration	0	L-9	2.01	surfacing, culverts, TSL “C”
	FR498	new const.	new const.		new const.	30	L-8	0.69	gate
FR498A		restoration	restoration	restoration	restoration	0	K-9	0.32	surfacing, culverts, TSL “C”
	FR498B	restoration	betterment		betterment	0	L-9	0.04	existing snowmobile trail- convert to road for dual use
	FR498B	betterment	betterment		betterment	5	L-9	0.18	existing road - clearing, template, surfacing, culverts
	FR498B	new const.	new const.		new const.	30	L-9	0.20	
	FR498Ba	restoration		long skid	restoration	0	L-9	0.27	existing OGM road - surfacing, culverts
	FR498C	betterment				5	L-8	0.22	existing road - clearing, template, surfacing, culverts
	FR498D	betterment	betterment		betterment	5	L-8	0.46	existing OGM road - clearing, template, surfacing, culverts
FR500.1		restoration	restoration	restoration	restoration	0	I-6	1.88	surfacing, culverts, TSL “C”
	FR500C	new const.				30	I-5	0.43	barricade when use completed
	FR529	betterment	betterment		betterment	5	J-9	1.04	existing OGM road - clearing, template, surfacing, culverts, move gate
	FR529	realignment	realignment		realignment	30	J-9	0.30	new location of section realigned
	FR529	new const.	new const.		new const.	30	J-9	0.27	
	FR529A	betterment	betterment		betterment	5	I-9	0.23	existing OGM road - clearing, template, surfacing, culverts
	FR529A	new const.	new const.		new const.	30	I-9	0.11	inslope road if feasible

Existing Road	New Road #s	Alt 1 Road Activity	Alt 2 Road Activity	Alt 3 Road Activity	Alt 4 Road Activity	Est. Ave. Clearing Width (feet)	Map Code	Segment Length (Miles)	Notes
	FR538	betterment	betterment		betterment	5	K-9	0.07	existing OGM road - clearing, template, surfacing, culverts
	FR538	betterment				5	K-9	0.43	existing OGM road - clearing, template, surfacing, culverts
	FR538A	betterment	betterment		betterment	5	K-9	0.74	existing OGM road - clearing, template, surfacing, culverts
	FR538A	restoration	betterment		betterment	0	K-9	0.04	existing OGM road - surfacing, culverts, gate
	FR538A	new const.	new const.		new const.	30	K-9	0.14	
FR637		restoration		restoration	restoration	0	L-3	0.74	surfacing, culverts
FR639		restoration	restoration	restoration	restoration	0	L-12	0.89	surfacing, culverts
	FR663	betterment	betterment		betterment	5	J-8	0.64	existing OGM road - clearing, template, surfacing, culverts
	FR663	restoration	restoration		restoration	0	K-8	0.27	existing road - surfacing, culverts, gates
	FR663	new const.	new const.		new const.	30	J-8	0.68	
	FR663A	betterment	betterment		betterment	5	J-8	0.35	existing OGM road - clearing, template, surfacing, culverts
FR664		restoration	restoration	restoration	restoration	0	L-12	0.62	surfacing, culverts
	FR665	betterment	betterment		betterment	5	J-7	0.71	existing road - clearing, template, surfacing, culverts, move gate
	FR665	betterment				5	J-7	0.31	existing road - clearing, template, surfacing, culverts
	FR665A	new const.	new const.		new const.	30	J-7	1.26	gate, closed, open for hunting or OGM if needed
	FR665B	betterment	betterment		betterment	5	K-7	0.22	existing OGM road - clearing, template, surfacing, culverts
	FR665B	new const.	new const.		new const.	30	J-7	0.57	gate, closed, open for hunting if needed

Existing Road	New Road #s	Alt 1 Road Activity	Alt 2 Road Activity	Alt 3 Road Activity	Alt 4 Road Activity	Est. Ave. Clearing Width (feet)	Map Code	Segment Length (Miles)	Notes
	FR740	new const.			new const.	30	F-15	0.69	gate, closed, open for hunting if needed
	FR740	new const.				30	G-15	0.99	
	FR740B	new const.				30	G-15	0.27	
	FR742	betterment				0	G-14	0.32	existing road, popular disp. rec site - template, limestone, culverts, construct 3-5 car parking area near gate
	FR744	betterment	betterment		betterment	5	H-13	0.21	existing road - clearing, template, surfacing, culverts, barricade when use completed
	FR873	betterment			betterment	5	K-9	0.73	existing road - clearing, template, surfacing, culverts, gate
	FR873	realignment			realignment	30	K-10	0.29	new location of section realigned
	FR873	new const.				30	K-9	0.48	
MLA469.1		restoration		restoration	restoration	0	N-6	1.57	township road- limestone, culverts
MWE301.1		restoration	restoration	restoration	restoration	0	K-11	0.67	township road- limestone, culverts

Road Density

Road density is affected by the proposed amount of new road construction and road decommissioning since these activities increase or decrease the mileage within the project area. The tables found in Chapter 2 identify the amount of new construction proposed by each MA for each alternative. In Alternatives 1, 2, and 4, new road construction is proposed (approximately 15 miles, 8 miles, 10 miles respectively) which would provide for more long-term, administrative access and increase the amount of corridor and mileage within the project area. As a connected action, approximately 0.3 miles of new construction would be needed in all action alternatives for removal harvests associated with shelterwood seed cuts proposed now. New road miles result in a permanent use of the surface of the land for the foreseeable future. No new construction is proposed with Alternatives 3 and 5, and therefore, no additional administrative access would be provided. With no action, public access on system roads would remain as it currently exits with no additional increase in road mileage or density.

Segments of existing FS and non-system roads not needed for long term planning or OGM administrative access that were less than desirable in alignment, location, or grade were considered for decommissioning under Alternatives 1, 2, 3, and 4 (approximately 7 miles, 5 miles, 2 miles, and 5 miles respectively). Under Alternative 5, no action, no decommissioning would take place and existing non-system roads from previous management or historical design would remain.

In order to utilize existing road corridors within the East Side project area, many OGM or other non-system roads need to be reconstructed to Forest Service standards to handle the capacity, traffic, and resource concerns. Such measures are included with Alternatives 1, 2, and 4. By reconstructing existing OGM or other non-system roads to Forest Service standards, additional mileage is added to the Forest Service road system even though no new corridors would be created.

Table 37 indicates the net impact of the road proposals by alternative. The total miles of road on the Forest Service system in Alternative 1 will increase by approximately 33.9 miles. This is not to say that there will be 33.9 miles of new road construction. Rather, that between the new construction of 15.2 miles, the realignment of 1.5 miles of road segments, the decommissioning of 0.6 miles of road, and the use of existing OGM and other non-system roads, the net impact is 33.9 miles of road that will be added to the Forest Service road system. The same process holds true for the other alternatives.

Table 37. Miles of FS Road by Road Management Objective for Each Alternative

Road Management	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Open	174.7	174.4	174.5	175.2	174.5
Closed	183.0	168.5	151.1	172.2	149.3
Restricted	143.4	142.9	143.4	142.9	143.4
Total	501.1	485.8	469.0	490.3	467.2
Net Impact: miles of road added to the FS road system	**33.9**	**18.6**	**1.8**	**23.1**	**0**

Table 38 indicates how the road density would change by MA for the various alternatives for *Forest Service roads with OGM roads* on the system. These numbers were arrived at by adding the existing mileage of roads in the *Forest Service roads with OGM roads* and the mileage of roads added to the system in each alternative. This number was then divided by the number of square miles in each management area. With No Action, public access on system roads would remain as it currently exists with no additional increase in road mileage or density. No decommissioning would take place, and existing non-system roads from previous management would remain. For the action alternatives, new construction would increase the number of road miles within the project area in Alternatives 1, 2, and 4 but would result in minimal change in density. For all alternatives and MA's, the expected density would be within the guidelines established in the ANF Forest Plan. The total row indicates that the road density in the project area does not vary significantly by alternative.

Table 38. Road Density by Management Area for FS and OGM Roads on System by Alternative

Management Area	Forest Plan Standard	Existing Condition	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Private	NA	0.3	0.4	0.3	0.3	0.4	0.3
2.0	2 to 4	2.9	3.1	3.1	3.1	3.1	2.9
3.0	2 to 4	2.1	2.3	2.2	2.1	2.2	2.1
6.1	1 to 3	2.1	2.1	2.1	2.1	2.1	2.1
6.2	1.5 to 4	1.9	1.9	1.9	1.9	1.9	1.9
7	NA	15.9	15.9	15.9	15.9	15.9	15.9
8	NA	0.1	0.1	0.1	0.1	0.1	0.1
Total	NA	2.1	2.3	2.2	2.1	2.2	2.1

Road Management

Road construction or reconstruction is designed to provide long term access into an area at the minimum level necessary to meet resource and use objectives. The Traffic Service Level of any road segment is "D" or "C". To facilitate road management, surfaced parking areas are constructed near gates to allow dispersed recreation users a place to park while using the forest. Several larger (3-5 car) parking areas are included within the alternatives. They are: FR243 (Alternatives 1-4), FR476, (Alternatives 1-4) and FR742 (Alternative 1 only). During the road design process, smaller (1-2 car) parking areas are located along open roads. These are typically located where recreationists are currently parking. Each site is reviewed and a decision is made to either rebuild or eliminate use as appropriate.

Proposed reconstruction or realignment of several OGM routes improve upon or incorporate their more usable segments and in some cases decommission the undesirable segments. These betterment activities would raise the Traffic Service Level of a non-Forest Service system road or temporary right-of-way to improve its safety or operating efficiencies to meet Forest Service system standards. Typically, these activities would include clearing, widening the template, constructing ditches, constructing or reconstructing small (1-2 car) parking areas, installing culverts, surfacing, and installing signs. Alternatives 3 and 5 include no betterment activities, and therefore, the current conditions will remain on those road segments.

Reconstruction-restoration measures would rebuild system roads to their approved Traffic Service Level, thus improving the drainage, surfacing, and filtration. Typically, these activities would include replacing culverts, signs, and surfacing. Minor clearing or excavation may occur to add culverts, turnouts, small (1-

2 car) parking areas, or other safety items. Several OGM roads within the project area have been constructed to standards similar to Forest Service system roads. These have also been categorized as restoration. All action alternatives propose some degree of restoration work, depending upon the routes needed for vegetation management. The "Summary Comparison of Alternatives" table in Chapter 2 identify the need for approximately 92 miles of restoration in Alternative 1; 81 miles in Alternative 2; and 87 miles in Alternatives 3 and 4. The no action alternative proposes no restoration measures, therefore, current conditions will remain on those road segments.

For each road proposed, a specific road management objective (open, closed, restricted) is anticipated. Table 39 displays how each alternative moves toward those objectives. The following discussion includes OGM roads on the system. Many of the adverse impacts of roads can be reduced by closing the road to certain types of traffic or during certain times of the year (restricting the use). Nearly all the proposed roads will be closed to public traffic. For the first few years following timber harvest, these roads may be open to hunting on an "as needed" basis. Alternative 5 has been updated from the 1997 Monitoring Plan data to reflect the current condition. Except for Alternative 5, which provides no new transportation investments, and Alternative 3, which only considers a minimal investment of road restoration activities, the alternatives move toward the Forest Plan Standards for percentage of open, closed, and restricted roads.

Table 39. Percentage of FS Roads by Road Management Objective for Each Alternative

Road Management	Forest Plan Standard	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Open	20%	35%	36%	37%	36%	37%
Closed	60%	37%	35%	32%	35%	32%
Restricted	20%	29%	29%	31%	29%	31%
Total	100%	100%	100%	100%	10%	100%

The East Side Project includes some connected actions for the timber resource. As an example, these include projected harvests in 3-10 years for shelterwood seed cuts proposed now. Based on those connected actions, some road activity is expected in the future. Over a 3 to 10 year period, much of the surfacing material on roads would be worn away, culverts may have rusted out, ditches would need to be reshaped. It is estimated that for all alternatives, 0.6 miles of betterment, 0.3 miles of new construction, and 63.6 miles of restoration will be needed. Specific roads and areas where this work is expected to be accomplished are documented in the project file. These connected actions will have a negligible effect with respect to the Forest Plan standards for construction and reconstruction-betterment, road density, and road management.

Cumulative Effects

The analysis area for discussing cumulative effects for roads will be the entire Allegheny National Forest unless otherwise stated. The East Side Project Area comprises 27% of the ANF. The Forest Service roads within this area comprise 37% of the Forest Service road system. To define an area that isolates the project area and any areas with interconnected Forest Service roads would include the area that is bounded by Tionesta Creek and SR 6 on the west; SR 59, SR 321 and SR346 on the north; and the proclamation boundary on the east and south. This area would include 80% of the Forest Service road system. With this high of a percentage of the Forest Service road system and the need to analyze past road activities and project future road activities, it is logical to consider the cumulative effects area for roads for this project to be the entire Forest Service road system. This will reduce the complexity of the

analysis and improve the accuracy of the projections. As an example, the East Side project area crosses: FR 176, FR 455, FR 279, FR 262, FR 259, FR 133, FR 127, FR 145, FR 339 and FR 143 among others. To determine which parts of these roads have been constructed/reconstructed in the past or expect to be reconstructed in the future would not be feasible. That is why interconnected roads should be included within the cumulative effects area for roads. Accomplishments and projections for private/township/state construction, reconstruction, and road management are not included in these projections due to limited data.

The ANF Forest Plan identified average annual amounts of miles of construction and reconstruction. These planned amounts are summarized in Table 40 for the management areas contained within the East Side project area (Forest Plan, pages 4-72, 4-84, 4-112, 4-127). Table 41 was developed using previous monitoring reports, work completed up to the DEIS since the last monitoring report, and projections of work to be accomplished in the East Side project area. The East Side column indicates the miles of each category that would be completed should that alternative be implemented. Forest Service miles accomplished on private land and ROW's are included in the figures for MA 3.0. This is where these numbers have been included historically in the monitoring plan. The numbers for betterment and realignment were lumped in the Forest Plan, so they were lumped in this table. The Forest Plan did not include any standard for restoration, but is included here for consistency and clarity.

Table 40. Construction and Reconstruction by MA-Forest Plan Standards and Guidelines

	Decade 2			
Management Area	**Construction**		**Reconstruction**	
	Mile/year	Mile/decade	Mile/year	Mile/decade
2.0	0.0	0	0.0	0
3.0	11.2	112	4.6	46
6.1	1.5	15	0.6	6
6.2	0.7	7	0.3	3
Total		134		55

The Cumulative Total miles column is the number of miles of road in that category that have been completed since Plan implementation including mileage for the East Side project area.

The % of Forest Plan miles column is the Cumulative Total divided by the Forest Plan allowed miles up to the end of FY 2000.

As an example, in Alternative 4 for Management Area 3.0, 20.8 miles of new construction per year were allowed in the first decade, and 11.2 miles of new construction per year were allowed in the second decade (Forest Plan, p. 4-84). The calculation for the % of Forest Plan miles is:

$$\frac{\text{Cumulative total for MA 3.0}}{(10 \text{ years} * 20.8 \text{ miles per year} + 5 \text{ years} * 11.2 \text{ miles per year})} = \text{\% of Forest Plan miles}$$

$$\frac{154.8}{264} = 58.6 \text{ percent}$$

Data is given by management area for MA 2.0, 3.0, 6.1, and 6.2 where activities are proposed within East Side. Data is combined for all other management areas.

The Total row denotes a weighted average to give an overall indication of how we are meeting Forest Plan outputs or objectives.

Table 41. Miles of Construction/Reconstruction By Management Area

ALTERNATIVE 1								
				Reconstruction				
	Construction			Betterment / Realignment			Restoration	
Mgmt Area	**East Side**	**Cumulative Total (miles)**	**% of Forest Plan miles**	**East Side**	**Cumulative Total (miles)**	**% of Forest Plan miles**	**East Side**	**Cumulative Total (miles)**
2.0	0.1	1.1	15.7	0.3	3.7	123.3	6.1	11.6
3.0	15.2	160.1	60.6	17.2	120.3	111.4	83.3	616.6
6.1	0	8.4	37.3	0	5.5	61.1	0.2	69.5
6.2	0	7.8	74.3	0	3.8	84.4	2.4	2.7
all other MA's	0	2.9		0	5.6		0	27.7
Total	15.3	180.3	59.3	17.5	138.9	115.7	92.0	736.7

ALTERNATIVE 2								
				Reconstruction				
	Construction			Betterment / Realignment			Restoration	
Mgmt Area	**East Side**	**Cumulative Total (miles)**	**% of Forest Plan miles**	**East Side**	**Cumulative Total (miles)**	**% of Forest Plan miles**	**East Side**	**Cumulative Total (miles)**
2.0	0.1	1.1	15.7	0.3	3.7	123.3	4.2	9.7
3.0	8.2	153.1	58.0	10.0	113.1	104.7	74.0	607.3
6.1	0	8.4	37.3	0	5.5	61.1	0	69.3
6.2	0	7.8	74.3	0	3.8	84.4	2.4	11.3
all other MA's	0	2.9		0	5.6		0	27.7
Total	8.3	173.3	57.0	10.3	131.7	105.8	80.6	725.3

ALTERNATIVE 3								
				Reconstruction				
	Construction			Betterment / Realignment			Restoration	
Mgmt Area	**East Side**	**Cumulative Total (miles)**	**% of Forest Plan miles**	**East Side**	**Cumulative Total (miles)**	**% of Forest Plan miles**	**East Side**	**Cumulative Total (miles)**
2.0	0.0	1	14.3	0.0	3.4	113.3	4.0	9.5
3.0	0.0	144.9	54.9	0.0	103.1	95.5	80.1	613.4
6.1	0	8.4	37.3	0	5.5	61.1	0.2	69.5
6.2	0	7.8	74.3	0	3.8	84.4	2.4	11.3
all other MA's	0	2.9		0	5.6		0	27.7
Total	0.0	165.0	54.3	0.0	121.4	97.5	86.7	731.4

ALTERNATIVE 4								
				Reconstruction				
	Construction			Betterment / Realignment			Restoration	
Mgmt Area	**East Side**	**Cumulative Total (miles)**	**% of Forest Plan miles**	**East Side**	**Cumulative Total (miles)**	**% of Forest Plan miles**	**East Side**	**Cumulative Total (miles)**
2.0	0.1	1.1	15.7	0.3	3.7	123.3	6.1	11.6
3.0	9.9	154.8	58.6	12.5	115.6	107.0	78.7	612.0
6.1	0	8.4	37.3	0	5.5	61.1	0.0	69.3
6.2	0	7.8	74.2	0	3.8	84.4	2.4	11.3
all other MA's	0	2.9		0	5.6		0	27.7
Total	10.0	175.0	57.6	12.8	134.2	107.8	87.2	731.9

ALTERNATIVE 5								
				Reconstruction				
	Construction			Betterment / Realignment			Restoration	
Mgmt Area	**East Side**	**Cumulative Total (miles)**	**% of Forest Plan miles**	**East Side**	**Cumulative Total (miles)**	**% of Forest Plan miles**	**East Side**	**Cumulative Total (miles)**
2.0	0.0	1.0	14.3	0.0	3.4	113.3	0.0	5.5
3.0	0.0	144.9	54.9	0.0	103.1	95.5	0.0	533.3
6.1	0	8.4	37.3	0	5.5	61.1	0.0	69.3
6.2	0	7.8	74.3	0	3.8	84.4	0.0	8.9
all other MA's	0	2.9		0	5.6		0	27.7
Total	0.0	165.0	54.3	0.0	121.4	97.5	0.0	644.7

The projected cumulative totals for new construction in all alternatives, by management area, are within the standard set in the Forest Plan. OGM has constructed new roads into areas, thereby reducing the need for the Forest Service to construct new roads. However, our use of these OGM roads has resulted in the cumulative total for betterment to exceed the Forest Plan standard in many categories.

The 1997 Monitoring and Evaluation Report for the ANF indicates that 1,141.5 miles of system roads exist on the ANF. Forest Service road density on the ANF is 1.7 miles per square mile for MA 3.0, 1.1 for MA's 6.1 and 6.2, and 1.5 for MA 2. It is likely that OGM development will continue to occur and increase the number of miles of road on the ANF. The continued approach of utilizing existing corridors on acceptable locations, rather than create new would maintain an efficient transportation system. Future activities similar to those proposed with East Side would strive to remain within or less than the Forest Plan road density standards and within or less than the Forest Plan road construction and reconstruction standards for each MA.

Projections of cumulative impacts for roads into the future (20 years) will be based on the levels of road activity indicated within the Forest Plan FEIS Table 4-12 and 4-13. These tables would indicate that there would be a maximum anticipated 141 miles of new construction forest-wide, and an estimated 58 miles of reconstruction – betterment forest-wide over the next 20 years. It should be noted that these numbers are within the current guidelines of the biological opinion for road construction and reconstruction. Based on these numbers, Table 42, Table 43, and Table 44 were developed to show the projected cumulative impacts on road density, road management, and road construction and reconstruction activities.

The numbers in Table 42 were developed with the assumption that all road construction and reconstruction – betterment would occur within management area 3.0. This assumption would result in the highest probable road densities, with the actual number being less. This table indicates that projecting future construction and reconstruction – betterment activities in all alternatives, the road density of Forest Service system roads will stay within the guidelines established in the Forest Plan.

Table 42. Cumulative Impacts: Road density for Management Area 3.0 for FS and OGM roads on system by Alternative

Management Area	Forest Plan Standard	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
3.0 Forest Wide - Cumulative	2 to 4	2.5	2.5	2.4	2.5	2.4

The numbers in Table 43 indicate that with the projected new construction, the cumulative total will stay within the projections established in the Forest Plan. This table also indicated that even over 20 years, that the forest will be slightly over the estimated reconstruction – betterment mileage. As stated elsewhere, this may be due to the use of OGM roads or other non-system corridors, thus reducing the new construction mileage needed.

Table 43. Cumulative Effects of Road Construction and Reconstruction

Alternative	Construction		Reconstruction	
			Betterment / Realignment	
	Cumulative Total (miles)	% of Forest Plan miles	Cumulative Total (miles)	% of Forest Plan miles
1	321.3	72	197	108
2	314.3	71	189	104
3	306	69	179	98
4	316	71	192	105
5	306	69	179	98

Table 44 was developed with the assumption that all new construction and reconstruction – betterment would be in the closed category. Due to rounding errors, the totals do not add up to 100% for all alternatives. This projection would indicate that implementing any alternative for East Side will bring the forest to approximately the same point with respect to road management over a 20 year period.

Table 44. Cumulative Effects: Percentage of FS Roads by Road Management Objective for Each Alternative

Road Management	Forest Plan Standard	Existing Condition	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Open	20%	37%	30	30	31	30	31
Closed	60%	32%	49	48	47	48	47
Restricted	20%	31%	22	22	22	22	22
Total	100%	100%	101%	100%	100%	100%	100%

Summary of Mitigation Measures and Effectiveness

No specific mitigation measures were identified for the transportation system in this section. Please refer to the Recreation section, Socio-economic Environment which identifies measures relating to seasonal restrictions on the construction and reconstruction of roads and timing of hauling. Refer to the Watershed section, Physical Environment which identifies mitigation measures relating to surface materials.

Oil, Gas, and Minerals

Affected *Environment*

In September of 1923, President Calvin Coolidge signed a proclamation forming the Allegheny National Forest. The lands forming this newly created National Forest were for the most part purchased from the various companies and individuals under the Weeks Act. Some of the original owners kept their subsurface rights while others third partied these reserved rights to oil, gas, or electric companies. The Federal Government only holds the subsurface rights on six percent of the lands making up the Allegheny National Forest. The regulatory agency for oil and gas operations is the Pennsylvania Department of Environmental Protection, and all operators must comply with their regulations and obtain all appropriate permits. The owners of the mineral estates have a right to extract their resources that cannot be denied by the surface owner. Although the Forest Service cannot approve or disapprove project proposals, the location of these facilities is negotiated with the developer during an on-the-ground review and during the environmental analysis process that alleviates or minimizes the environmental impacts.

There are several existing stone pit sources within the project area, most of which are approximately one acre each. Within the project area, there are also 10 potential sources for stone. These pits provide surfacing material for road construction and reconstruction activities. At times, OGM operators for similar activities also purchase stone. Several pipeline rights-of-way exist within the project. These pipeline rights-of-way are designed for light administrative traffic only.

Environmental Consequences

Direct and Indirect Effects

Table 45 identifies the number of new pits proposed for development, the number proposed for expansion and an estimated amount of clearing needed for the alternatives. Most are located in MA 3.0. The information presented in Table 45 is based upon field estimates of additional clearing acres needed. As a general assumption, approximately ½ to 1 acre of land is used for new pit development while approximately 0.75 acre is used for expansion.

Each of the action alternatives proposes both new pit development and expansion in support of the transportation activities. Therefore, this will result in additional clearing in the project area and loss of stone at the pit site that is an irretrievable, irreversible action. Under the no action alternative (Alternative 5), no additional pits would be developed and, hence, no loss of stone would occur as a result of this project.

Table 45. Stone Pit Development Activities And Clearing Acres

Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
New Pit Development (# of)	10	8	7	10	0
Existing Pit Expansion (# of)	33	28	26	33	0
Clearing (acres)	40	33	30	40	0

Cumulative Effects

It is estimated that there are approximately 2,000 producing oil and gas wells on the ANF. There may be up to 8,000 abandoned wells within the proclamation boundary. It is anticipated that, on average, 160 wells can be expected to be drilled per year and private operators plug approximately 100 to 200 wells per year. The new well locations equate to approximately 50 acres of ground disturbance for the construction of well pads. Along with the existing wells includes approximately 1,300 miles of OGM roads on ANF and for new locations, approximately 50 miles of new OGM roads could be expected to be developed per year. While operators occur across the entire ANF, activity is heaviest in the eastern third. Current areas of increased development are in the Hastings and Salmon Creek areas.

There would be no cumulative effect associated with the no action alternative as a result of this project. There would be no need for additional surfacing material. However, other projects occurring within the next 20 years with surfacing needs would require additional stone material from existing or potentially new sources, depending upon the road locations. The action alternatives would utilize existing and new potential sources of stone for transportation activities. It is likely that additional projects would also have surfacing needs, and hence, need to utilize stone pit sources. The result is an irreversible, irretrievable action. Across the ANF, approximately five new pits are opened annually while ten are depleted and closed. About 150,000 cubic yards of pit run stone are utilized per year. In addition, an average of 10,000 cubic yards of commercial stone are purchased each year for use on the ANF. Stone pit areas will be reclaimed when pit areas no longer function as pits. This work may include reshaping cut faces, spreading topsoil reclaimed from the pit area, creating vernal ponds, and planting with native grasses and bushes.

Summary of Mitigation Measures and Effectiveness

A mitigation measure is included with the timber sale contract to protect pipelines, well locations, roads, utility corridors, and other improvements used by mineral owners or special use permittees for all activities conducted in the project area. The effectiveness of this measure lies in avoidance and in the fact that use of existing rights-of-way, such as pipelines, are negotiated with the developer during operations that alleviates or minimizes the potential for damage.

BIOLOGICAL ENVIRONMENT

Vegetation

Affected Environment

The affected environment for vegetation is discussed in three sections: 1.) a historical perspective, 2.) biodiversity concepts, and 3.) project area and treatment area composition and structure.

Section 1: Vegetative Historical Perspective

This section of the affected environment discusses vegetation in terms of vegetation associations, natural disturbances, drought, harvesting, deer browsing, recent management activity, forest health, and conditions on private land.

Vegetation Associations

The types of plant communities and plant associations found in the East Side project area have resulted from a combination of ecological processes and cultural activities. Early surveyor's records of the ANF suggest that the forest, prior to settlement by Europeans, consisted primarily of American beech (44 percent) and eastern hemlock (20 percent). Sugar maple, red maple, and white pine each represented 5 percent, and black cherry represented only 0.8 percent of the trees recorded in these early surveys (Whitney 1990). In the late 1800s, the East Side project area most likely had a similar species composition before harvesting began. Hemlock was most abundant on moist sites along stream bottoms and poorly drained upland areas, and beech and maple were more abundant on better-drained sites. Where hemlock did not block out most of the light or decrease the soil pH, it is thought that the most common understory plants were hobblebush, maple-leaved viburnum, spinulose wood-fern, and shining club moss.

Natural Disturbance

Historically, wind (including tornados), drought, and ice were the primary disturbance factors. Significant damage occurred on the ANF from ice storms in 1936 and 1965. Small tornadoes cause damage in the area every couple of years. The most severe damage in recent years occurred from one of the numerous tornados that touched down in northern Pennsylvania on May 30, 1985, blowing down several thousand acres within the project area. Scattered blowdown occurs annually during more minor windstorms.

Blowdown frequency and abundance do not appear to differ appreciably between areas harvested and areas where no harvest has occurred. While some residual standing trees in harvest units may blow down, the frequency and intensity will differ between units, as it does in untreated stands, depending on the proximity to localized winds. We do, however, expect less blowdown in alternatives where salvage harvest occurs (see Table 59). The harvest of dead and dying trees removes those stems that are the most vulnerable to blowdown.

Fires occurred within the project area during the 1920's to 1930's following the period of heavy logging and accumulation of coniferous slash. Defoliation from insects, forest diseases, and browsing by hare and deer (common, but not abundant during the 1920s), were also undoubtedly part of the natural disturbance regime of the forest. Before 1900, natural disturbance attributable to insects and diseases came from native pests. Since then, exotic pests/diseases (chestnut blight, gypsy moth, beech bark disease complex, etc.) have played a major role in forest disturbance. While many forest stands were mature or over-mature, the forest itself was composed of stands of different age and size classes due to these natural

disturbances. The variability in stand structure and composition represented the various stages of recovery from past disturbance.

Droughts

The National Oceanic and Atmospheric Administration (NOAA) maintains the Palmer Drought Severity Index (PDSI) as an index of drought conditions across the United States. The index has been calculated for every year since 1896. The Allegheny National Forest is located in Region 10 of Pennsylvania. From 1896 through 1940, the mean June-July PDSI for this region fell below -1.0 (a moderate or worse drought) in 56 percent of the years. From 1940 through 1994, the mean June-July PDSI for the region fell below -1.0 only 20% of the time. In fact, from 1971 through 1988, there were no years in which the mean June-July PDSI fell below this threshold (NOAA 1995). However, since 1988, there have been three years where PDSI values were more negative than -1.0 (1988, 1991, and 1995). Thus, it is apparent that there are long cycles of weather that affect forests. (For example, drought had a heavy impact on hemlock in the 1930s.) It is probable that these weather cycles interact with other natural and introduced stresses to impact overall forest health.

Harvesting

Harvesting began slowly in the early 1800's and accelerated in the mid to late 1800's, with the forest products being used for lumber. Agricultural use was limited because the unglaciated soils generally were too poor for profitable farming. Marquis (1975 and 1994) has summarized historical logging and disturbances that occurred on the Allegheny Plateau between the 1890's and the 1930's, including the East Side project area. Hemlock bark was used in the tanneries, and some of the species were used in the local distillate plants. Knowledge of these past cutting practices helps us understand how the present forest originated and developed. This provides insight into silvicultural practices that can be implemented successfully to produce desired vegetative conditions today. Many of the second growth stands within the project area originated from a series of cuts occurring from the late 1800's to the early 1900's. The first cut was usually for Hemlock. Another entry was made for the remaining sawtimber sized material followed up very shortly by the removal of the remaining trees for chemical wood. This shelterwood-like sequence of cuts created even-aged stands with only a few scattered residuals. Each of these partial cuts was followed by a surge of advance reproduction that influenced the composition and character of the stands we have in the project area today.

Deer Browsing

Many of these cuts removed most, if not all, of the trees on a site, so a shift to shade-intolerant species occurred in many stands. Much of the project area became dominated by even-aged black cherry and red maple mixed with shade intolerant sugar maple and other shade-intolerant or mid-tolerant tree species. The present even-aged forests developed during the period of ever increasing deer herds on the ANF. Deer herds were very small when the stands were in the stand initiation stage and increased dramatically to 40-60 animals per square mile during the pole-timber/small sawtimber stages. Deer browsing even today, with deer populations averaging 20-30 deer per square mile, limits our ability to successfully develop tree seedlings.

Deer browsing has had a major impact on the regeneration and development of forest understories and wildlife habitat (Tilghman, 1989, Jones, et al, 1993, deCalesta, 1994) on the ANF. This is true for the project area. Many of the second-growth species are dependent upon advanced regeneration. Because of extensive browsing by deer, advanced regeneration is usually absent. Other species (hay-scented and New York fern, grasses and sedges, beech root suckers, and striped maple) fill the growing space vacated by browsed seedlings, cast dense shade at the forest floor level, and interfere with the establishment and survival of tree seedlings.

Recent Management Activity

Much of the 139,990 acres of Federal land within the project area was acquired by the Allegheny National Forest during the 1930's. Few records exist about management of the area for the next 30 to 40 years. Custodial management occurred in many areas, although significant amounts of timber stand improvement, spraying to control defoliating insects, tree planting, and commercial tree harvesting occurred. An undetermined amount of browse cutting occurred in the 1960's and 1970's. This involved cutting smaller diameter trees and shrubs during the winter to create food for deer.

Table 46 displays the amount and kinds of activity that have occurred within the project area since 1986. Many of these treatments actually occurred on the same sites at different times. For example, a shelterwood preparation cut is often used to develop advanced tree seedlings prior to a final harvest cut. Most reforestation treatments follow a shelterwood or final harvest. Many of the wildlife projects are completed in areas previously thinned or regenerated.

Table 46. ANF Management Activities within the 139,990-acre East Side Project Area, 1986-1998

Activity	Acres
Harvest Treatments (1986-1998)	
Even-aged Final Harvest	11,765
Shelterwood Seed	5,005
Two-age Prep	66
Two-age	549
Uneven-age Prep	24
Uneven-age Selection	2,408
Intermediate Thinning	16,728
Salvage Thinning	4,570
Reforestation Treatments (1986-1998)	
Planting	188
Fencing	2,669
Herbicide	6,885
Site Preparation for Natural Regeneration	6,047
Site Preparation (Striped Maple Cutting)	1,768
Fertilization	5,800
Release/Timber stand improvements	1,230
Certification of Regeneration in Final Harvest Areas	10,576
Wildlife Habitat Improvement (1990-1998)	
Create/Manage Upland Opening	285
Regenerate Aspen	22
Seeding	206
Planting	1,570
Fence	1,125
Release (Hemlock and Shrubs)	581
Pruning	559
Structures (each)	238
Insect Suppression (Biological Insecticide) (1986-1998)	67,491

Forest Health History

Ecosystems are dynamic; change is inevitible. Across the landscape, a healthy forest renews itself vigorously and is resilient to a wide range of disturbances. It is characterized, both physically and biologically, by diversity of composition, structure, and function. This includes a variety of genes, species, plant and animal communities, and complex dynamic processes, all of which are interconnected through space and time. Within this ecological context, healthy forests are sustainable while providing for current and future human needs across a continuum of values, places, uses, services, and objectives (USDA Forest Service, 1995b).

A large number of stressors have affected the East Side project area ecosystems. When viewed across the landscape and over time, they have contributed to the current health of these ecosystems. The following discussion briefly summarizes them.

As was mentioned in the previous section, forest stands within the project area are primarily even-aged and second-growth, a result of the harvesting carried out in the late 19th and early 20th century. The age, structure, and maturity of the resulting forest is fairly uniform. As trees mature, they naturally become more vulnerable to insect and disease infestations. The death of individual trees provides light and growing space for the remaining trees to use, or it provides an opportunity for tree seedlings to develop. Dead trees furnish dead and down material on the forest floor, important for nutrient recycling and as a component of wildlife habitat. Under natural conditions, a forest would be composed of different tree age classes resulting from growth response to natural disturbances (wind, fire, insects, diseases, etc.) and individual tree mortality. Trees over 70 years old occupy 87 percent of the East Side project area. This uniform, mature forest is more vulnerable to damage from repeated natural stresses (droughts, late spring frosts, open winters, native defoliators such as elm spanworm and forest tent caterpillar) and exotic insects or diseases (beech bark disease complex, pear thrips, gypsy moth). When excessive deer browsing and interfering plants severely limit tree seedling development and growth, healthy young trees may not replace trees that die, interrupting the natural cycle which normally maintains continuous forest cover on the land.

Between 1965 and 1985, (See USDA-FS 1985, "A Twenty-Year History of Forest Insect and Disease Management on the Allegheny National Forest, 1965 - 1985") insects and diseases had an impact on the East Side project area. Substantial insect defoliation has occurred since 1985, and the average level of defoliation appears to have exceeded that which occurred between 1965 and 1985. American beech in the project area has been suffering decline and mortality from the impacts of the Beech Bark Disease complex (an exotic pest). In the mid-1990's, a substantial portion of the project area was sprayed with a biological insecticide (bacillus thuringiensis) to help reduce defoliating insect damage to tree crowns and to help reduce the potential for tree mortality to develop. Without spraying, tree mortality/decline would have been higher. Severe droughts have occurred within the project area three times in the past decade, in 1988, 1991 and 1995. The project area is unglaciated and predominantly on plateau top topographic positions. Nutrient demanding species, like sugar maple and white ash, are more vulnerable to drought and defoliation stress on sites with low nutrient capital, like unglaciated plateau sites in the project area. Decline in these species is evident (Horsley and Long 1999, pp 60-65). The ANF FY 97 Monitoring and Evaluation Report (USDA-FS 1998a) provides a Forest Health summary for the ANF, much of which applies to the project area. Table 47 summarizes the defoliation and spraying activity that has occurred within the project area between 1986 and 1998. Little defoliation is anticipated during 2000.

Table 47. Summary of Insect Spraying and Naturally Occurring Stresses on Forest Vegetation - East Side Project Area (1984-1999)[1]

	Acres Defoliated								
STRESS EVENT	**1986**	**1987**	**1988**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**
Gyspy Moth	92		70						
Severe Drought [3]			X	X				X	
Elm Spanworm				17,099	23,886	126,783			
Elm Spanworm and late Spring frost					13,457				
Cherry Scallopshell Moth						701	17,990	88,146	4,734
Pine Budworm							1,014		
Forest Tent Caterpillar						3,919	7,716		
INSECT	**Acres Sprayed [2]**								
Gypsy Moth		610	655						
Elm Spanworm							39,031		
Forest Tent Caterpillar								32,046	

1 *In the East Side Project Area, there were no acres defoliated or sprayed in the years 1984, 1985, 1989, 1990, and 1997 through 1999.*

2 *Using biological insecticide Bacillus Thuringiensis var. Kurstakii.*

3 *Palmer Drought Severity Index below -1.0.*

A substantial portion of the East Side project area was repeatedly defoliated during the six-year period between 1991 and 1996 (Table 48). Close to half of the area has been defoliated two or more times, and almost one-quarter of it has suffered three or more defoliations. This is particularly significant given the two severe droughts that also occurred during the same period. These repetitive stresses serve to weaken trees and make them much more susceptible to attack by secondary pathogens which actually kill the trees.

Table 48. Cumulative Defoliation within East Side Project Area - 1984 through 1999

# of Years Defoliated	Acres	% of Total Project
0	6,384	4
1	36,728	24
2	74,340	48
3	30,063	19
4	6,299	4
5	1,067	1

In summary, the last 15 years have been a period of high stress for forests in the project area. The impacts of defoliation have been compounded by droughts occurring more frequently than in the past. Nutrient capital, already low on plateau top sites, may have been further reduced by acid deposition. Sugar maple, a key species in the project area, is less resilient to stress on sites low in magnesium and calcium in this area (Horsley et al, in press).

For as long as the Pennsylvania Atmospheric Deposition Network has maintained record (since 1982), the region of the Allegheny National Forest has received heavy inputs of sulfate and nitrate through wet deposition. Since the passage of the Clean Air Act, sulfate concentrations and wet depositions have decreased somewhat. In contrast, nitrate concentrations and wet depositions have not declined. The mean growing season nitrate concentration, measured at the Kane Experimental Forest during the period 1982-1997, was 1.91 mg./L. The sulfate concentration for the same period was 3.67 mg./L. The total estimated deposition of nitrate at the Kane Station in 1997 was 20.98 kg/ha of nitrate, and 26.07 kg/ha of sulfate (Lynch et al., 1998). In New England, deposition with similar characteristics on soils poor in base cations has been associated with accelerated soil acidification (Likens et al., 1998), which is associated with leaching of base cations from the soil. Locally, sugar maple decline has been associated with two or more moderate to severe defoliations within a decade on sites with low levels of base cations, especially magnesium and calcium (Horsley et al., 1999). Thus while no local evidence directly links atmospheric deposition with forest health problems, research results from elsewhere suggest that atmospheric deposition may contribute to the problem.

Dead and declining trees are very evident throughout the project area. McWilliams et al (1996) evaluated inventory data from 340 stands on 8,343 acres of the Allegheny National Forest, primarily within what is now the East Side project area. In the summer of 1994, ANF personnel or contractors collected detailed stand data on these sites that were among the hardest hit by tree decline and mortality. Data collected included information about overstory and understory vegetation.

McWilliams et al (1996) described stand structure and composition and described the status of tree seedlings and interfering plants on the areas examined. Across all 340 stands, 12 percent of the total basal area per acre was in dead trees and 16 percent was in trees at high risk of mortality (Figure 1). For sugar maple, 59 percent of the basal area was dead or at risk of dying. "At risk of dying" meant they had lost enough of their normal crown such that it is probable they would die. Prior to recent mortality, sugar maple was the dominant species in these 340 stands; now it ranks third behind black cherry and red maple. Beech and red maple were the other important decline species, with 28 and 20 percent of their basal area dead or at risk, respectively. Adequate numbers of tree seedlings were present in only 8 percent of sampled stands. Vegetation that interferes with tree seedling development and growth was present in sufficient quantities to require treatment in 90 percent of the stands examined. Sparse regeneration, tree mortality and decline, and the abundance of interfering vegetation raise serious concerns about tree seedling development and survival as well as the maintenance of forest cover on these sites.

Figure 1. Percentage of basal area by Tree Status for Stands with significant Forest Decline Symptoms on the Allegheny National Forest.

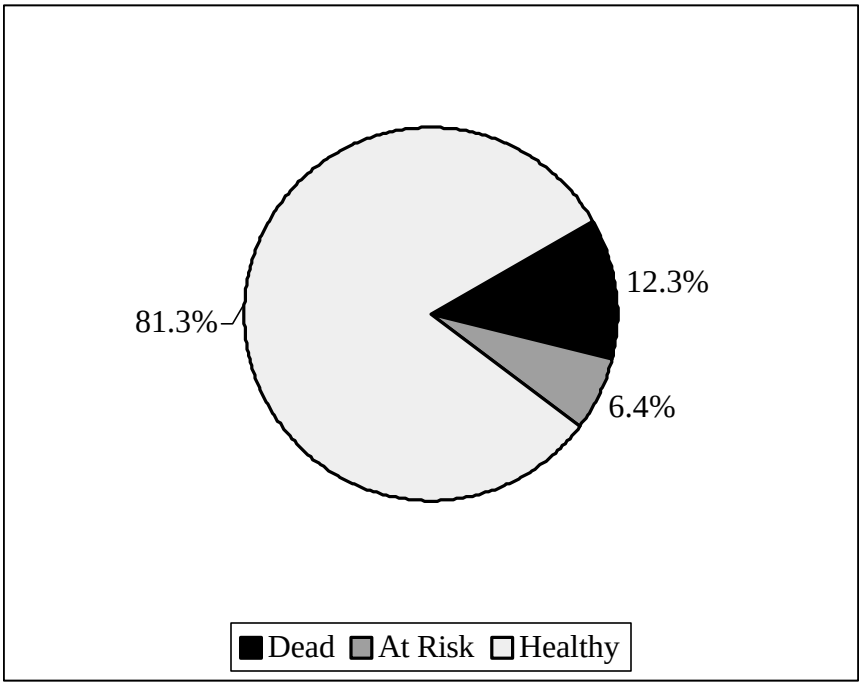
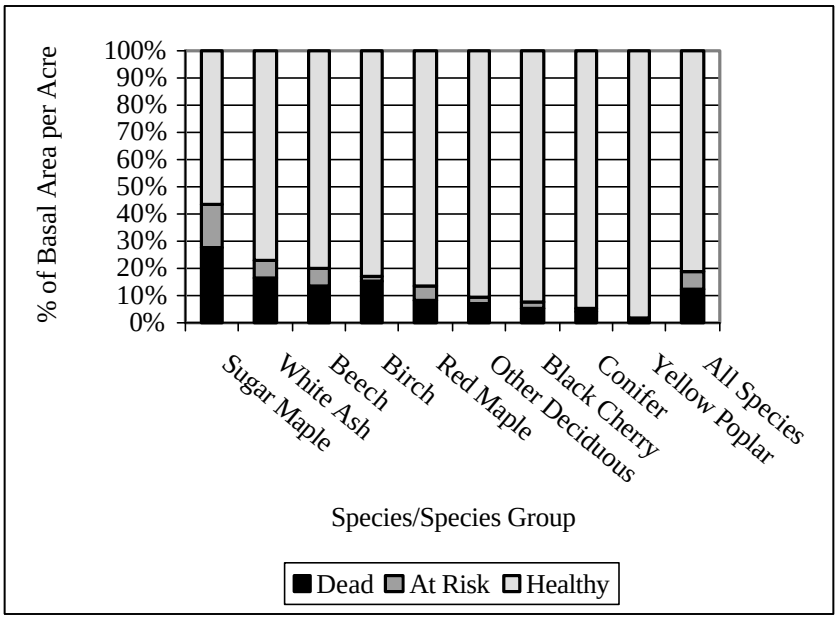


Figure 2. Percent of Basal Area Per Acre by Tree Status and Species/Species Group for Stands with Significant Forest Decline Symptoms on the Allegheny National Forest.



In 1999 McWilliams and others updated this analysis to include an additional 529 stands (10,533 acres), primarily located within what is now called the East Side project area, which showed substantial symptoms of tree decline. Stand data was collected in this second group of stands in 1995 and 1996. This second group of stands inventoried was believed to contain lesser amounts of dead and dying trees.

When analyzed together, the 1994, 1995, and 1996 data collected included 869 stands (18,876 acres) and represents a fairly large, site-specific inventory and independent analysis of conditions within the project area on sites where tree mortality and decline is most evident. Figures 1 and 2 display the results of this larger area analysis by tree status and species group. Dead trees and trees at risk of dying account for 18.7% of the total basal area in this larger sample while they accounted for 28% of the total basal area in the smaller sample which was known to include areas where tree decline was more severe.

This expanded analysis also served to confirm the understory vegetation analysis described above. Adequate numbers of tree seedlings are present in only 8 percent of sampled stands. Vegetation that interferes with tree seedling development and growth is present in sufficient quantities to require treatment in 93 percent of the stands examined. Sparse regeneration and the abundance of interfering vegetation continue to raise serious concerns about tree seedling development and survival as well as the bng-term maintenance of forest cover on sites where tree mortality and decline are or may become most severe.

Tree death is part of the life cycle of any forest. Why have so many trees died or why are so many in danger of dying now on the Allegheny National Forest? MacKenzie and Acciavatti (1995) suggest the answer is, in part, based on understanding the roles that numerous coinciding stress factors have in tree decline.

Certain stresses, such as unusual droughts, initially may make trees susceptible (predispose them) to other secondary stresses. These secondary stresses (inciting factors) further weaken trees because trees are forced to use their energy reserves to survive. Being in a weakened state, trees can then be attacked by other insects and diseases that will eventually kill them (contributing factors). (Acid rain may play a role in forest decline, but that role has not been determined for the ANF.) When these factors happen over a wide area, it sets the stage for natural catastrophic conditions to occur. (USDA-FS 1995b)

In FY 1990, Forest Health Protection personnel from Morgantown, WV, established 30 permanent plot clusters on all Ranger Districts to monitor pear thrips and maple decline. Since then, trees have been evaluated annually on the basis of crown dieback, leaf dwarfing, foliage transparency, and foliage discoloration. Sugar maple mortality through 1997 is much higher than the average sugar maple mortality observed from 1989 through 1994 in similar plots located throughout the Northeastern U.S. and Southeastern Canada. In fact, the ANF rate is three to four times higher. (USDA-FS 1998a, pp. 33-34)

Private Land

Trees on adjacent private land within the East Side project area have been equally affected by the stresses described above. They have experienced similar levels of mortality and decline, although perhaps somewhat higher in areas where defoliation has been more severe. The current increase in tree mortality and the increase in the number of trees that have poor live crowns are occurring predominantly among hardwood species. While sugar maple has generally been healthy in the five-state region around the ANF, it is declining in certain places, including the four-county area within which the ANF is located (USDA-FS, 1995, pp 4 & 8). The relative stocking of sugar maple in these counties (Elk, Forest,

McKean, and Warren) has declined 0.12 percent between the 1978 and 1989 statewide forest inventories. Landowners have completed a substantial amount of salvage harvesting of dead/declining trees.

An analysis of data collected on 248 plots containing sugar maple installed by the U.S. Forest Service Inventory and Analysis Unit across the northern tier of Pennsylvania during the 1987-89 survey of Pennsylvania identified 25 declining plots, or about 10 percent (Drohan et al., 1999). There were a slightly, but not significantly, higher proportion of declining plots within the unglaciated portion of the northern tier than in the glaciated portion. Thus, the sugar maple decline problem extends across northern Pennsylvania.

Section 2: Biological Diversity Concepts

Biological diversity is the "variety and variability among living organisms and the ecological complexes in which they occur" (Office of Technology Assessment, 1987). Biological diversity is often explained in terms of species diversity, genetic diversity, and ecosystem diversity. Each of these three levels of diversity has its own structure (patterns or organizations within a system), composition (number and abundance of elements within a system), and function (ecological processes within a system).

Species Diversity

Species diversity depends on the number of different species (richness) and the relative abundance (evenness) of those species. Evenness is at its maximum when all species have the same relative abundance. However, this seldom occurs because in each habitat there are usually a few species with a lot of individuals and many species with just a few individuals.

There are approximately 142 plant species found on the ANF. The majority of hardwood tree species affected by mortality and decline are sugar and red maples, beech, and white ash. Black cherry and a number of other less abundant hardwoods are affected to a lesser extent. Trees in both the understory and overstory and in managed and unmanaged stands have died or declined across the project area. Even though trees have died, no tree species has been eliminated from any stand. Therefore, local and regional plant richness remains the same.

On sites with severe mortality, the total number or abundance of live trees is dramatically reduced. Sites with moderate to light mortality have less drastic reductions. However, changes in relative abundance only occur on those sites where the various tree species are dying at different rates.

What has also changed dramatically is the structure of the vegetation both vertically and horizontally. Gaps have formed in the formerly closed canopy. These gaps allow sunlight to reach the ground stimulating the ground layer plants and seeds in the seedbed. Theoretically, shrubs and tree seedlings should eventually occupy these gaps creating a multi-storied stand. On the ANF, however, shrubs and seedlings are repeatedly browsed by deer allowing interfering plants, such as ferns and grasses, or beech and striped maple, to increase in cover, thus preventing the establishment of seedlings due to dense shade. Those seedlings that do manage to grow within ferns and grasses are then browsed when they get above fern height. The result is a two-storied stand with a partial overstory and a fern/grass ground cover. Once this occurs, no midstory, and thus no future overstory, can develop without removing the existing understory. In many cases, the deer population must also be reduced. Alternatively, browsing by deer can be reduced by excluding deer from an area (with fences) or overwhelming them with suitable alternate forage. Seedlings do not develop well beneath dense beech or striped maple. Those that do are also subject to deer browsing. However, sites occupied by beech and striped maple provide some mid-story structure.

The majority of wildlife species do not discriminate between tree species (other than the major distinction between deciduous and coniferous) but do discriminate in the type of vegetative structure used. If several layers of vegetation are present on a site, more combinations are present, and thus, there are potentially more habitats available. This represents within-stand diversity.

Between-stand diversity is represented by how vegetative structure changes horizontally over the landscape. Once again, the number of potential habitats will increase with more horizontal changes. Areas with severe mortality have increased the horizontal structure by varying the height of the main canopy. The size of the "patches" that result range from 2 to 62 acres. Areas with moderate to light mortality have only minor changes in the main canopy.

Standing dead trees or snags are another structural component that has increased due to the mortality; the number of snags is usually low in second growth stands. Snags are important as potential sources of cavities and as future downed material. Some wildlife species only use snags or den trees where there is a complete tree canopy.

Whether the vegetative structural changes are beneficial or detrimental depends on the individual wildlife species involved. These are discussed in the wildlife section. A Biological Assessment (BA) of all Federally listed threatened and endangered species and all Region 9 sensitive species that may occur on the ANF (including plants) are contained in Appendix C.

Genetic Diversity

Genetic diversity is the genetic variation among individuals of the same species. As long as individuals survive and can interbreed with other subpopulations (for plants through wind dispersed pollination, animals carrying seeds, etc.), the gene pool will maintain its variability.

Individuals of each tree species have died or are declining. There is no reasonable way of knowing if these individuals are genetically different from those that have survived. It is known that certain beech trees are genetically resistant to the beech scale/nectria disease, although they may not be resistant to defoliators or other diseases. If a genetically resistant beech tree is cut, the resulting beech stump sprouts and root suckers will also be resistant because they are genetically identical to the original stem. It is also known that red pine has very little genetic differences among individuals.

Most of the declining tree species have wind-dispersed and wind-pollinated seeds, therefore, there should be no loss in variability from the mortality.

Ecosystem/Landscape Diversity

The Forest Service has adopted a hierarchical ecological classification system that places units of land into different levels of resolution or site specificity. This system can be used to describe large-scale ecosystem diversity. At the section level (tens to thousands of square miles), the Allegheny National Forest is part of the Northern Unglaciated Allegheny Plateau. The Sections are further broken down into two subsections primarily based on differences in landform, climate, and soils. Land Type Associations (hundreds to thousands of acres) are currently being developed and Ecological Land Types (tens to hundreds of acres) are in the field test phase and final corrections are being completed. Please refer to the Ecological Landtype section in the physical environment section of this chapter for additional information regarding species commonly found within the landtypes within East Side.

In addition to community composition (forest types) and community structure (tree sizes or ages), landscape structure refers to the size and shape of patches of similar type forest or other plant communities, the amount of "edge" separating different types of patches, the linkages between similar patches, and the juxtaposition of different communities across the landscape. In this project, many

patches have been changed or created by tree mortality/decline. The function attributed to landscape biodiversity is the flow of species, materials, and energy through the landscape or over time (i.e., nutrient cycling, emigration, or immigration). Areas with severe mortality have increased the size of non-forested or sparsely forested patches and decreased the continuous forested patch size. Areas with light mortality have only minor changes in the main canopy.

Section 3: Project Area and Treatment Area Composition and Structure

This section of the affected environment describes the current condition of a number of overstory, midstory, and understory forest vegetation characteristics that are measurable and potentially could be affected by tree mortality/decline. They include dead and live tree composition, forest type/age class, relative density, midstory/understory, unique plant communities, and the amount of late successional forest. These characteristics will play an important role in evaluating the environmental consequences of each alternative. Additionally, this section discusses the potential for uneven-aged management in terms of Forest Plan direction and feasibility within the project area.

Dead and Live Tree species Composition, Sizes, and Abundance

Both dead and live trees are abundant within the project area. Based on data collected as part of the Forest Health Monitoring program, we can have 95% confidence that the average condition across the East Side project area includes between 6.7 and 13.9 dead trees per acre ≥9" DBH, between 2.0 and 6.8 dead trees per acre ≥ 12" DBH, and between 0 and 1.1 dead trees per acre ≥20" DBH. Based on the same data, we can have 95% confidence that the average condition across the East Side Project Area includes between 56.6 and 83.4 live trees per acre ≥9” DBH and between 5.1 and 12.0 live trees per acre ≥20” DBH. The Biological Assessment (Appendix C) contains additional information.

Dead trees are part of the ecological relationships found in a forested setting. Dead trees eventually break down and become part of the soil nutrient cycle. They potentially can affect the health of other trees by harboring or nurturing secondary pathogens that can spread to living trees. They can be a safety hazard to forest users, especially around developed recreation sites or along transportation routes. Dead trees are beneficial in that they add to the structure of the stand. They leave behind gaps in the canopy thereby increasing the light supply to the forest floor. In turn, the additional light may stimulate seedling development. Wildlife species also benefit from the various size classes and amounts of dead trees found across the landscape. Please refer to the wildlife section for the benefits and species that utilize dead wood.

Forest Types/Age Class

A number of forest types (see glossary for definitions) are found in the East Side project area. Northern hardwoods, Allegheny hardwoods, and upland hardwoods collectively occupy 85% of the project area. Note that MA 3.0 appropriately contains a much higher proportion of Allegheny hardwoods (48%) than does MA 2.0 (14%), or MA 6.1 (29%). MA 2.0 has double the proportion of Northern hardwoods than the average for the project area, and almost three times the proportion in MA 3.0. This distribution is appropriate given the emphasis on even-aged management in MA 3.0 (which favors shade-intolerant species such as Allegheny hardwoods) and uneven-aged management in MA 2.0 (which favors shade tolerant species in the Northern hardwood type).

Tree species commonly found in the project area include black cherry, white ash, tulip poplar, red and sugar maple, black and yellow birch, and American beech. Quaking aspen, red and white pine, white and

Norway spruce, and hemlock are found in limited quantities. Table 49 and Table 50 display the vegetation types and age-class distribution of National Forest System lands within the project.

Table 49. East Side Project Area Forest Type/Management Area Summary

	MANAGEMENT AREA									
	MA 2.0		MA 3.0		MA 6.1		MAs 6.2, 7, 8		Project	
FOREST TYPE	**acres**	**% of MA**	**acres**	**% of MA**	**Acres**	**% of MA**	**acres**	**% of MA**	**acres**	**%**
Red pine	10	1%	2,090	2%	522	5%	32	0%	2,653	2%
White pine	5	0%	7	0%	0	0%	0	0%	13	0%
White pine/Hemlock	0	0%	0	0%	17	0%	0	0%	17	0%
Hemlock	0	0%	1,467	1%	188	2%	103	1%	1,758	1%
Conifer (undifferentiated)	0	0%	133	0%	0	0%	0	0%	133	0%
Tamarack	0	0%	66	0%	0	0%	0	0%	66	0%
White and Norway Spruce	0	0%	184	0%	266	3%	0	0%	450	0%
Northern red oak	0	0%	0	0%	75	1%	0	0%	75	0%
Oak/Hardwood transition	0	0%	31	0%	8	0%	0	0%	39	0%
Red maple (wet site)	9	1%	1,059	1%	8	0%	26	0%	1,103	1%
Mixed Lowland Hardwood	143	9%	1,690	1%	288	3%	13	0%	2,134	2%
Northern hardwood	511	31%	14,486	12%	3,493	33%	3,684	31%	22,139	16%
Allegheny hardwood	232	14%	55,721	48%	3,090	29%	4,743	40%	63,786	46%
Red maple (dry site)	0	0%	6,539	6%	289	3%	236	2%	7,064	5%
Sugar maple	0	0%	263	0%	0	0%	0	0%	263	0%
Beech	15	1%	187	0%	0	0%	6	0%	208	0%
Black Birch	30	2%	74	0%	0	0%	652	6%	756	1%
Mixed Upland Hardwood	544	33%	28,355	24%	1,849	18%	2,004	17%	32,751	23%
Aspen	6	0%	275	0%	44	0%	0	0%	325	0%
Unknown	76	5%	435	0%	16	0%	0	0%	527	0%
Total acres of forest cover	1,581	97%	113,027	97%	10,154	96%	11,499	97%	136,261	97%
% forest cover of project area		1%		83%		7%		8%		100%
OPENING										
Lowland shrub	0	0%	326	0%	87	1%	3	0%	416	0%
Upland Shrub	0	0%	82	0%	54	1%	16	0%	152	0%
Opening	57	3%	2,548	2%	242	2%	314	3%	3,160	2%
Total	57	3%	2,956	3%	383	4%	332	3%	3,729	3%
Total Project Acres By MA	1,638		115,984		10,537		11,831		139,990	
% Of Total Project Area		1%		83%		8%		8%		100%

During the past five years, tree mortality and decline have initiated forest type changes on the sites proposed for treatment as part of this project (see Table 50). When enough trees of a species die within a stand, the mix of tree species dominating the site can change substantially enough to change the forest types assigned to it. Data is available on 7,581 acres of the proposed treatment areas that permits us to estimate trends in forest type changes that are occurring. The primary change has been a shift of 916 acres from the sugar maple, beech, and upland hardwood forest types to the Allegheny hardwood,

Northern hardwood, and red maple forest types. Though we do not know the forest types for the 642 acres in the unknown category before mortality/decline began to develop, we can see from this data that they now are predominantly Northern hardwoods, Allegheny hardwoods, and red maple. Information regarding this kind of change is not readily available for much of the rest of the 139,990-acre project area.

Table 50. Forest Type Changes from Tree Mortality/Decline during the Past Five Years in Stands Proposed for Treatment

Forest Type	Whole Stand before Mortality/Decline (~1993)	Healthy Stand after Mortality/Decline (~1998)	Change
Unknown*	642	0	-642
Red pine	562	562	0
Tamarack	30	30	0
White & Norway spruce	57	57	0
Northern hardwoods	538	699	+161
Allegheny hardwoods	1,627	2,661	+1034
Red maple	922	1,285	+363
Sugar maple	172	20	-152
Beech	26	14	-12
Upland hardwoods	3,635	2,895	-752
Total	***8,223***	***8,223***	***0***

Adequate data is not available to describe the vegetation condition on these acres before mortality/decline began.

Almost all of the project area and all of the treatment sites are even-aged, a result of the extensive clearcutting that occurred during the first three decades of the twentieth century. Some stands where beech (or in a few instances hemlock) is beginning to sprout in the understory have the beginnings of a second age class. With beech bark disease complex present, beech is unreliable as the main source of tree seedlings for a second sustainable age class. Many stands contain a variety of tree size classes that are not indicative of a different age class; those smaller trees were just slower growing and in many instances are the same age as the larger trees.

Table 51 shows the East Side project area age class composition by management area. Three-fourths of the project contains stands that are 51 to 110 years old. Approximately 3% of the project area is older than 111 years, with the majority of that in MA 8 (Tionesta Scenic Area and Tionesta Research Natural Area). Almost all (97%) of the project area consists of forest cover, with the remaining 3% in openings. Only 11% of the project area is less than 20 years old, with MA 3.0 slightly higher at 13%. Using Forest Plan averages, the projected 0 - 20 year age class by the end of 2005 for the project area would be close to 18%. Existing non-forest habitat (openings) identified in Table 49 is discussed under the wildlife section.

Table 51. East Side Project Area Age Class/Management Area Composition

	MANAGEMENT AREA									
	MA 2.0		MA 3.0		MA 6.1		MAs 6.2, 7, 8		Project	
AGE CLASS	acres	% of MA	acres	% of MA	acres	% of MA	acres	% of MA	acres	% of project
0-10	0	0%	6,444	6%	31	0%	800	7%	7,275	5%
11-20	41	3%	7,775	7%	159	2%	680	6%	8,656	6%
21-50	94	6%	7,402	6%	496	5%	627	5%	8,619	6%
51-110*	1,416	86%	89,617	77%	9,386	89%	5,898	50%	106,317	76%
111+	30	2%	616	1%	49	0%	3,494	30%	4,189	3%
Unknown	0	0%	1,173	1%	33	0%	0	0%	1,206	1%
Total acres of forest cover	1,581	97%	113,027	97%	10,154	96%	11,499	97%	136,261	97%
% forest cover of project area		1%		81%		7%		8%		%
OPENING	57	3%	2,956	3%	383	4%	332	3%	3,728	3%
Total	1,638		115,984		10,537		11,831		139,990	100

** 32,302 acres or 30 % of this age class is currently 91 to 110 years old, 57% is 71 to 90 years old, and 13% is 51 to 70 years old*

According to the information presented in Table 52, 97% of the acres treated in this project are 51 to 110 years old. One third of those acres are Allegheny hardwoods, and over half are upland hardwoods and red maple. All of these types thrive and produce high quality hardwoods under even-aged growing conditions (the conditions currently present on the sites). This table also indicates that only two percent (180 acres) of the treatment areas are 111+ years old. Over 19% (1,579 acres) of the proposed treatment areas are 91 to 110 years old, the age class that would move into the older category (111+ years old) within the next 20 years. But in the context of the entire project area, these 1,579 acres are only 5% of the total 91 to 110 year age class (32,302 acres, see Table 51).

Table 52. East Side Project Treatment Areas - Summary (acreage) of Present Age Classes

Forest Type	Age Class				
	11-20	21-50	51-110	111+	Total
Red pine			562		562
Tamarack		28	2		30
White & Norway Spruce			57		57
Northern hardwoods			581	117	698
Allegheny hardwoods	52	11	2,568	30	2,661
Red maple		12	1,246	27	1,285
Sugar maple			20		20
Beech	3		11		14
Upland hardwood		17	2,873	6	2,896
Total	***55***	***68***	***7,920****	***180***	***8,223***

**1,579 acres proposed for treatment are 91 to 110 years old*

Relative Density

Most areas proposed for standard treatment have experienced low to moderate levels of tree mortality/decline. More substantial changes have occurred in the forest canopy vegetative structure of the areas proposed for salvage treatment. The mostly closed, dense overstory canopy of fairly mature hardwood stands has been opened; the extent of the openings depends on the number of trees that have died or are dying. In severe mortality areas, the crowns of the remaining trees will not grow sufficiently to close the gaps. Trees will not fully utilize the available site. Before mortality began to develop, over 75% of the proposed treatment acres had relative densities greater than 60% and ninety-six percent had relative densities greater than 40%. Presently, only 55% have relative densities greater than 60%, and only 75% exceed 40% relative density. (see Table 53).

Table 53. East Side Project Treatment Areas - Changes in Stand Relative Density Resulting from Tree Mortality/Decline

Relative Density	Healthy Tree Component of the Stand	
	Present Condition	**Pre-mortality/Decline (~1993)**
unknown*	0	179
0-15%	30	30
16-40%	2,025	121
41-59%	1,620	1727
60-79%	2,491	3106
>79%	2,057	3060
Total	***8,223***	***8,223***

**Adequate data is not available to describe the healthy tree component in ~1993.*

Midstory/Understory

As a result of browsing associated with high deer populations for over the past 60 years, forested stands throughout the project lack the understory conditions that normally would result from natural disturbances. Past deer browsing has virtually eliminated the shrub understory in much of the area and most likely has reduced the number of herbaceous plants, including some wildflowers. Deer browsing of desirable native plants has also resulted in encroachment of interfering vegetation such as ferns, grasses, beech or striped maple. When those desirable native plants were removed or died, interfering plants moved in to occupy much of the vacant growing space. Recent, site-specific, understory vegetation data is not available for the entire 140,000-acre East Side project area. However, understory vegetation data collected in 1992 at 6,000 plots throughout MA 3 on the ANF indicates the average conditions listed in Table 54 exist across the ANF (USDA-FS 1995a, p. 25-26). Past monitoring under similar conditions indicates that the trend over time is for seedling area to diminish and interfering plants to increase.

When interfering plants are this abundant, our information indicates tree seedlings have a limited ability to become established. Many other desirable native plants (including shrubs and some wildflowers) are similarly affected. Plant diversity has been reduced. When tree seedlings are not present on the ground and their development is severely restricted by interfering plants, natural catastrophic events (such as tree mortality) threaten tree and forest sustainability. It is very difficult for vigorous young trees to grow from seed, gain dominance over the interfering plants, and replace trees that die.

Table 54. Summary of MA 3 Understory Vegetation Conditions on the ANF from Plot Data Collected on 6,000 Plots in 1992*

Category	1992 Plot Data
% of MA 3 having Interfering Plants	70%
By overstory stocking category	
Well-stocked	66%
Moderately-stocked	79%
In riparian areas	70%
% of MA 3 Having Adequate Tree Seedlings	23%
Black Cherry Seedlings	20%
Other Species of Tree Seedlings	3%
In Riparian Areas	10%
By Overstory Stocking Category	
Well-stocked	18%
Moderately-stocked	29%

**Source: (USFDA-FS 1995, Tables 11 & 12, pp. 25-26)*

Stands proposed for treatment in this project include many sites having substantial amounts of interfering plants (Table 55). Based on guidelines developed through local research (Horsley et al, in Marquis, 1994b, p. 216), ninety percent of the sites have enough interference to limit development of tree seedlings and other herbaceous vegetation, compared with an estimated seventy percent throughout MA 3 in the rest of the project area (Table 54). Interference on the treatment sites consists primarily of ferns and grass. On close to one-third of the areas the interference also includes beech and striped maple. Even if we only consider those stands that are already very well-stocked with interfering plants (≥ 80% of plots stocked), almost two-thirds of the stand acres meet this criteria. In summary, interfering plants are extremely abundant on the proposed treatment sites...abundant enough to significantly limit development of tree seedlings and desired herbaceous plants.

Table 55. East Side Project Treatment Areas - Present Stocking of Plants Which Interfere with Tree Seedling Development

	≥ 30% of Plots Stocked		≥ 80% of Plots Stocked	
Interfering Plant Category	**Acres**	**% of Total Project ***	**Acres**	**% of Total Project ***
Fern/Grass	7,001	85	3,743	46
Beech/Striped Maple	2,544	31	289	4
Total Interference	7,377	90	4,960	60

* *Percent shown in this column reflects the proportion of the total project treatment acres (8,223 acres) in each interference category.*

Tree seedlings are very sparse on the proposed treatment areas, a condition frequently found in areas where interfering plants are so abundant. Tree seedlings adequate to maintain continuous forest cover exist on only 8% of the treatment sites (Table 56, Column 1). They are almost twice as abundant as the average on Allegheny hardwood sites, and virtually nonexistent on Northern hardwood sites. Birch

seedlings (dense enough to interfere with the development of other tree seedlings and to completely dominate the understory of the site) are abundant on 10% of the treatment areas (Table 56, Column 3) with the potential for much more to develop due to the seeding characteristics of birch. Birch has the ability to compete more effectively under these understory conditions, setting up the potential for a forest type conversion and domination of the site by a tree which on many sites becomes infested by nectria spp. (a canker which infects the main bole of the tree making it susceptible to snapping and other forms of rot).

Midstory canopies are important structural components. On the treatment sites, they consist almost entirely of beech and striped maple seedlings/saplings (Table 56, Column 2), which interfere with the development of herbaceous plants and other tree seedlings. Almost one third of the project sites have a midstory canopy, with the Northern hardwood type having almost twice the average, as expected.

Table 56. East Side Project Treatment Areas - Summary of Present Understory Woody Vegetation

	Adequate Tree Seedlings [1]		Midstory Canopy [2]		Birch Seedlings [3]		Forest Type
Forest Type	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Total Acres**
Red pine							562
Tamarack							30
White & Norway spruce							57
Northern hardwood	15	2	419	60	30	4	698
Allegheny hardwood	404	15	905	34	316	12	2,661
Red maple	64	5	313	80	115	9	1,285
Sugar maple							20
Beech			11	79			14
Upland hardwood	197	7	1,037	36	371	13	2,896
Total	***680***	***8***	***2,685***	***33***	***832***	***10***	***8,223***

1 Stand acres where ≥ 70% of the plots in the stand are stocked with adequate numbers of tree seedlings to reforest the site, if necessary.

2 Stand acres where ≥ 30% of the plots in the stand are stocked with ≥ 8 beech/striped maple seedlings per plot.

3 Stand acres where ≥ 30% of the plots in the stand are stocked with ≥ 8 birch seedlings per plot

Late Successional Forest/Old Growth

The Forest Plan provides general guidelines related to the amount and distribution of old growth for each management area. For MA 6.1 lands in the project, old growth habitat is to be provided on a minimum of 10% of the area and should be distributed so that at least 100 of every 1,000 acres contain future old growth (Forest Plan, p. 4-113). Within MA 3.0, old growth habitat should be provided on a minimum of 5% of the area (USDA-FS 1986a, p. 4-84). While the Forest Plan provides direction as to the amount of old growth habitat to provide, it does not specify how it should be identified or distributed.

Late successional or old growth forest provides compositional and structural values not found in younger communities. While some of these characteristics, such as larger diameter trees and old growth within-stand structure can be enhanced or promoted through management activity, other old growth values can only be achieved over time. It exists on approximately 3,500 acres of the project area within the Tionesta Scenic Area and the Tionesta Research Natural Area. The Forest Plan considered forests to be old growth when they reached 111 years (USDA-FS 1986, p. 4-73). We now recognize that old growth

characteristics may just begin to develop at this age, and we consider second-growth stands 111+ years old as "potential" old growth or late successional forests.

When looking for potential old growth, we look for stands capable of providing some of the structural conditions or functional values characteristic of old growth. Stands which contain unique features such as boulders, rock outcroppings, inclusions of spring seeps or wetlands, remnant large diameter trees or shrubs, and/or understory conifer inclusions are good potential old growth candidates.

There are almost 4,200 acres older than 111 years within the East Side project area (Table 51). Of that, only 180 acres (4%) are proposed for treatment (Table 57). Close to 84% (152 acres) of these 180 acres proposed for treatment are poorly stocked with healthy overstory trees, 96% (172 acres) have a heavy understory of interfering plants, and only 4% (8 acres) have tree seedlings present in quantities adequate to ensure long-term maintenance of forest cover on the site (Table 57).

Close to 69% of the entire project area is in the 71 to 110-year-old age class and could develop into potential old growth during the next ten to 50 years. In fact, 32,302 acres or 22% of the project area is in the 91-110 year-old age class.

Table 57. Present Condition for Stands ≥ 111 Years Old which are Proposed for Treatment

Characteristics	Acres	% of Total
Forest Type		
Northern hardwood	117	65
Allegheny hardwood	30	17
Red maple	27	15
Upland Hardwood	6	3
Total	180	100%
% of Plots Stocked with Interference		
≥ 30%	172	96
≥ 80%	172	96
Adequate tree seedlings present	8	4
Midstory Present	123	68
Birch Seedlings/Saplings	0	0
Healthy Stand Relative Density		
≤ 40%	152	84
40-79%	0	0
≥ 80%	28	16

Potential for Uneven-Aged Management

Forest Plan Direction

Forest Plan direction established even-aged management as the featured silvicultural system in Management Areas 1, 3.0, and 6.2. Management Area 1 emphasizes early successional stages of vegetation and small diameter timber products (USDA-FS 1986a, Ch. 4, pp. 12, 60, and 64). Management Areas 3.0 and 6.2 emphasize production of high value, high quality, Allegheny hardwoods and oaks (USDA-FS 1986a, Ch. 4, pp. 11, 12, 82, 83, 125, and 126). In these management areas, uneven-aged management may be an option on inclusions, such as riparian areas, wet soils, or visually sensitive areas. Its use will be based on individual site analysis (USDA-FS 1986a, Ch. 4, pp. 87 and 131). Table 4-13 (USDA-FS 1986a, p. 4-84) and Table 4-19 (p 4-127) reflect no UEAM acreage estimates since it was expected to be a minor part of total harvest activity.

Uneven-aged management is the featured silvicultural system in Management Area 2.0 (USDA-FS 1986a, Ch. 4, pp. 12, 70, and 75). For MA 6.1, both systems are considered when timber harvest is used to meet wildlife or recreation objectives.

Feasibility of Uneven-aged Management

When deciding which sites in a project should be considered for uneven-aged management, it is critical to know the characteristics of sites where it has a chance of being biologically successful. Uneven-aged management favors shade-tolerant tree species and over the long term, would cause stands dominated by shade-intolerant or shade mid-tolerant tree species to convert to shade-tolerant species (Stout in Marquis 1994b, p. 330; Marquis & Johnson in Burns 1989, p. 11). Without an adequate seed source, it would be either very difficult or very expensive (see Chapters 1 and 2) to establish shade-tolerant tree seedlings. The choice of silvicultural systems in Allegheny hardwoods would be wider were it not for the unusually high deer damage to regeneration on the ANF (Redding 1995; Tilghman 1989). Local silvicultural guidelines specify stands having 35 basal area of shade tolerant species as potentially providing an adequate seed source for uneven-aged management (Marquis et al 1992, p. 57), though local success with UEAM on these sites has been very marginal (USDA-FS 1997a, p. 16, 17, 76, 77).

Logically, any stand having adequate shade-tolerant tree seedlings already present in the understory is also a potential candidate for uneven-aged management. Sugar maple, Eastern hemlock, and American beech are the only shade-tolerant tree species present in the project area. Of these, only American beech seedlings are present in sufficient quantity for the stand to be classified as having adequate numbers of shade-tolerant seedlings.

Approximately one-third of the sites proposed for treatment in this project meet one or both of the criteria (see last column in Table 58). Sites meeting either of these criteria are equally represented (at 20% each). These conditions are most frequently found (more than half of the forest type qualifies) on the following forest types: wet site red maple, Northern hardwoods, sugar maple, and beech.

Table 58. Acres and Percent by Forest Type that Meet UEAM Feasibility Criteria in Areas Prescribed for Treatment in Alternative 4

		Adequate Beech Regeneration		≥ 35 BA Shade Tolerant Species		Total with Beech and/or ≥ 35 BA	
Forest Type	**Total Acres**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**
Red pine	561						
Tamarack	30						
White & Norway spruce	57						
Red maple	27	15	56			15	56
Northern hardwoods	699	405	58	271	39	494	71
Allegheny hardwoods	2,661	379	15	460	17	694	26
Red maple	1,258	195	15	87	7	259	21
Sugar Maple	20			20	100	20	100
Beech	14			14	100	14	100
Upland hardwoods	2,896	627	22	906	31	1,227	42
Total	***8,223***	***1,621***	***20***	***1,758***	***21***	***2,723***	***32***

Environmental Consequences

Direct/Indirect Effects

The direct and indirect effects discussion of vegetation divides effects into two sections:

- By evaluating direct and indirect effects of individual types of vegetation treatments on vegetation, and
- By evaluating the combined direct and indirect effects of all the activity on the sites proposed for treatment in each alternative.

Section 1: Effects of Individual Vegetation Treatments on Vegetation

Summary of the Direct/Indirect Effects from Individual Activities Proposed in the Alternatives

Alternatives 1 through 4 propose overstory and/or understory treatments on many sites affected by substantial tree mortality and decline within the East Side project area. No treatment of any site is proposed in Alternative 5. Alternatives 1, 3, and 4 also propose treatments on some sites that are not substantially affected by tree mortality or decline; other Forest Plan resource management objectives have determined the need for the harvest at those specific locations. Discussions that follow address the direct and indirect effects on vegetation of proposed even-aged and uneven-aged timber harvest activities and reforestation treatments. Effects on vegetation will occur primarily from proposed commercial timber harvest, reforestation treatments, non-commercial treatments, wildlife habitat improvement work, and from doing no treatment at all on a site (particularly where tree decline or mortality is occurring). These activities can result in changes in understory and overstory conditions, as well as changes in plant species composition and diversity. Table 59 displays specific vegetative treatments proposed under each alternative and provides the reader a quick reference to activity amounts for the discussion which follows.

The discussion covers separately the expected effects of salvage thinning in Alternative 2, since Alternative 2 salvage thinning, by design, is expected to produce a different outcome on sites affected by severe tree mortality and decline than is expected for salvage thinning in the other alternatives. All of the activities proposed in this project have some effect on biodiversity and more specifically on vegetative structure that affects wildlife habitat. These general effects would be the same in all alternatives where the activity is proposed. Brief mention is made here of a few effects on wildlife for each activity, but a more detailed wildlife analysis is presented in the wildlife section.

Table 59. Vegetation Treatment Summary By Alternative (shaded area indicates 0 acres of treatment)

	TREATMENT BY ALTERNATIVE									
	ALT 1		ALT 2		ALT 3		ALT 4		ALT 5	
TREATMENT	**Green**	**Salv[2]**	**Green**	**Salv[2]**	**Green**	**Salv[2]**	**Green**	**Salv[2]**	**Green**	**Salv[2]**
Commercial Even-aged Timber Harvest										
▪ Clearcut	112	84			40	84	9			
▪ Shelterwood seed cut followed by shelterwood removal cut	665	1,259			328	1,131				
▪ Shelterwood removal cut	72	42			72	42				
▪ Delayed Shelterwood Removal cut	70	601			54	497				
▪ Intermediate thinning	1,776	2,467		4,219	533	1,909		2,473		
Total Even-aged Management	***2,695***	***4,453***		***4,219***	***1,027***	***3,663***	***9***	***2,473***		
Commercial Two-aged Timber Harvest										
▪ Two-age Prep Cutting followed by two-age cutting	167	86			79	47				
▪ Two-age cutting		132				129				
Total Two-aged Management	***167***	***218***			***79***	***176***				
Commercial Uneven-aged Timber Harvest										
▪ Group Selection Cutting	154	115			154	115	154	115		
▪ Transition Cutting	18				18					
▪ Individual Tree Selection	118	40			77	12	870	1,724		
Total Uneven-aged Management	***290***	***155***			***249***	***127***	***1,024***	***1,839***		
Total Harvest	***3,152***	***4,826***		***4,219***	***1355***	***3,966***	***1,024***	***4,312***		
Total Green and Salvage Harvest	***7,978***		***4,219***		***5,321***		***5,336***		***0***	
No Harvest - Reforestation Only	***76***	***169***			***76***	***393***	***64***	***570***		
Reforestation Treatments										
▪ Fertilization	454	868			252	852				
▪ Fencing	619	1,697			305	1,672	49	988		
▪ Site Preparation for natural regeneration	176	87			57	87		59		
▪ Herbicide Application	1,118	2,369			667	2,339	557	2,426		
▪ Site preparation/ striped maple cutting	887	1,943			575	1,899	501	2,228		
▪ Tree planting	223	594			148	586	49	253		
Total Reforestation	***3,477***	***7,558***			***2,004***	***7,435***	***1,156***	***5,954***		
Total Green & Salvage Reforestation Treatments	***11,035***		***0***		***9,439***		***7,110***		***0***	
TSI/Release[3]	346	230			346	230	252	157		

Table 59 ***Notes***

1 - "Green" final harvests are those conducted where stands are moderately to well-stocked with healthy trees (relative density > 40%). "Green" thinnings occur when more than half of the volume harvested consists of live, healthy trees.

2 - Salvage (salv) harvests consist of three types: 1) intermediate harvests in healthy stands where more than half of the volume removed consists of dead trees or trees at risk of dying, 2) final harvests in stands poorly stocked with healthy trees (relative density < 40%), and 3) in Alternatives 2 and 4, intermediate treatments in poorly stocked stands where the volume removed is dead or at risk of dying and the residual stand will remain poorly stocked.

3 - Release treatments will no doubt be necessary on more acres than indicated here, but at this stage in the reforestation process it is very difficult to predict which sites will require it. The need for additional treatments will be evaluated when appropriate.

Note: The alternatives include 9 acres of research study sites that include 3-acre tests of shelterwood, delayed shelterwood and clearcutting. These demonstration sites will receive an herbicide preparation treatment and will be protected with a fence.

Direct and Indirect Vegetative Effects from listed Activities or No Treatment

General Effects of Harvest/Salvage

Harvest - Harvesting removes the main portion (bole) of the tree from the site. Tops of trees are left on the site, increasing the dead and down material component in the short run and increasing the number of low perches. Since most of the nutrients in the trees are in the leaves, branches, stump and roots, there will only be minor effects on nutrient cycling and soil fertility. Soil compaction will occur on skid roads and any areas where equipment is used repeatedly. Best management practices will keep this condition to a minimum. Since merchantable dead and dying trees will be removed, there will be fewer snags on harvested sites, but the Forest Plan guideline of leaving 5 snags per acre greater than 10 inches dbh will be followed.

Salvage - Salvaging dead and dying trees does not affect live tree species composition because the effect on species composition occurs, whether or not there is a harvest. It will reduce the number of snags and potential snags because some of them will be removed. Cutting beech that are dying due to defoliation, but which might be resistant to the beech scale nectria complex, does not deplete genetic variability. Once a beech is cut, the resulting root suckers and stump sprouts carry the same genetic potential as the parent tree and thus increase the number of resistant stems in that localized area. There is always a chance that cutting a dying tree will remove a certain combination of genes from an area. This chance is remote since most hardwoods involved are wind pollinated, have wind-dispersed seeds, and genetic recombination occurs all the time.

Effects of Even-aged Management

Clearcuts and shelterwood cuts result in even-aged stands of hardwood forests. Tree species that are shade intolerant (black cherry, white ash, yellow poplar) grow well under these conditions. Soil drainage, animal damage, and other environmental factors also influence which trees will eventually occupy the site, and they affect the vertical vegetation diversity as well. (USDA-FS 1986, p. 4-21) Site nutrient capability also plays a role. Recent local research conducted across the Northern tier of Pennsylvania and the Southern tier of New York indicates unglaciated upper slope sites and the plateau top are sensitive sites where sugar maple and other high base cation-demanding species (such as white ash and basswood) may be more vulnerable to stress events such as insect defoliation (Horsley et al 1999, pp. 60-62).

Landowners and managers should consider management activities that favor species with lower base cation requirements (such as black cherry).

The long-term, forest-wide effect of even-aged silviculture on vegetative patterns is to create horizontal diversity which results from differences in vegetation age/sizes between stands. An even-aged forested landscape would contain a mosaic of seedling/sapling, poletimber, sawtimber, and old growth stands, scattered across the landscape. (USDA-FS 1986, p. 4-22) The mix of vegetative conditions found in a balanced even-age landscape provides for more diversity of wildlife habitats than the mix of conditions found across a landscape managed primarily as uneven-aged (DeGraaf 1987).

Activities

Shelterwood seed cut, Salvage Shelterwood Seed cut - Shelterwood seed cuts are proposed on 1,924 acres under Alternative 1 and 1,459 acres under Alternative 3 (Table 59). Sixty-five percent of them are salvage in Alternative 1, and seventy-eight percent are salvage in Alternative 3. There are no shelterwood seed cuts in Alternatives 2, 4, or 5.

A standard shelterwood seed cut treatment (referred to as "green" in Table 59) is used on sites where it is desirable to establish tree regeneration and there is an opportunity to increase the seedling component to achieve wildlife and/or age class diversity objectives by completing the subsequent shelterwood removal cut (USDA-FS 1986, pp. 4-18 to 21; Horsley in Marquis 1994b, p. 223). Most of these stands are declining but are still moderately to well-stocked (relative density >40%) with live, healthy trees. These are designated with a treatment objective of "green".

Salvage shelterwood sites are designated with an objective of salvage (referred to as "salv" in Table 59). These treatments are designed to enhance tree seedling development in order to ensure long-term maintenance of moderate to well stocked forest cover on the site. They are prescribed where the relative density of the healthy tree component of the stand is expected to drop to or below 40% during the next five or ten years. This determination is based on indicators at the site (current crown health, tree species, site factors, etc) and past management experience.

The shelterwood method of treatment is a multiple-step regeneration harvest where approximately one-third of the overstory is removed in the initial or shelterwood seed cut. Once adequate tree seedlings develop, the second step, the shelterwood removal cut (see explanation in the next subsection), would occur. [Where the treatment is salvage driven, more trees may be removed (before they die), or the healthy overstory tree stocking may already be lower than normal]. Whether salvage or green, the initial harvest opens up the canopy to allow more sunlight to reach the forest floor. Reforestation treatments may be required to provide adequate conditions for seedlings to germinate and grow (these are described later in this subsection). The additional sunlight and growing space enables new tree seedlings to germinate from seed and/or sprout from the stumps of harvested trees.

"Green" shelterwood harvest involves removing primarily healthy trees, whereas salvage shelterwood harvest may consist almost entirely of dead or dying trees or a combination of healthy and dead/dying trees. To ensure successful tree seedling development, salvage shelterwood areas may require more supplemental planting or other reforestation activities than normal since adequate numbers of seed producing trees may not be well distributed across the site.

All stands proposed for shelterwood harvests presently have interfering understory vegetation consisting of fern, grass, beech and striped maple. A series of understory treatments are proposed to substantially reduce interfering species. The increased light conditions created by the shelterwood harvest and understory reforestation treatments will result in development of primarily mid-tolerant and intolerant tree seedlings, such as black cherry, white ash, red maple, birch, and tulip poplar. The species that develop on a particular site depend on the seed source present, the impact of selective deer browsing (deer prefer

some species more than others), and reforestation and release activities. These treatments would also increase herbaceous vegetation in the understory.

Mitigation measures WL 10&12 (see mitigation list) will help to ensure that species composition or overall diversity and stand structure (including the dead wood component) will not be reduced or eliminated as a result of the proposed treatments.

The objectives of these mitigation measures are to maintain some vegetative structure and species diversity after the removal cut (described below) is implemented in the next 3-10 years. We have found that the best way to meet this objective in the future stand is to identify trees that provide the desired component before the shelterwood sequence is begun. This allows us to retain the most desirable trees on the site and reduces the risk that some of these trees would be removed during the shelterwood harvest.

Shelterwood Removal Cut and Salvage Shelterwood Removal Cut - Shelterwood removal cuts are proposed on 2,709 acres under Alternative 1 and 2,124 acres under Alternative 3 (Table 59). Seventy percent of them are salvage in Alternative 1, and seventy-nine percent are salvage in Alternative 3. There is no shelterwood removal harvest in Alternatives 2, 4, or 5.

These treatments remove many of the overstory trees that were left as a seed source during the shelterwood seed cut (USDA-FS 1986, p. 4-18). In most cases, shelterwood removal cutting would not occur until after the site is fully stocked with seedlings capable of growing in full sunlight. Residual trees that include snags, den trees, conifer, mast species and uncommon species will be retained following harvest. Removal of the overstory will result in rapid growth and development of tree seedlings, shrubs and herbaceous understory vegetation and would promote the development of primarily intolerant tree species, with lesser amounts of mid-tolerant species. These treatments are expected to reduce the amount of beech in the stand.

White-tailed deer cause extensive damage by feeding on Allegheny hardwood and Northern hardwood tree seedlings. Only even-aged methods that provide abundant sunlight enabling seedlings to quickly grow out of the reach of deer are practical. Even then, reforestation practices (such as fencing, fertilization, and site preparation) are often necessary. The choice of silvicultural systems would be wider were it not for the unusually high deer browsing on the ANF. Shelterwood removal cutting provides an appropriate response. (USDA-FS 1986a, pp. D-7 to D-9) In one step, it provides abundant sunlight to existing tree seedlings permitting them to rapidly develop.

The first type of salvage removal cutting listed in Table 59 (shown as "Shelterwood Removal Cut") would occur within the next 2-3 years. It is associated with substantial tree mortality and decline and would occur under the following conditions:

- where healthy stand relative density is expected to drop to or below 40% during the next five to ten years, and
- where adequate seedlings exist, or
- where there are adequate seedlings near the sparsely stocked seed trees but tree planting will be required to fill in the intermingled low-stocked areas.

The second type of salvage shelterwood removal cutting (shown as "Shelterwood Seed Cut Followed by Shelterwood Removal Cut") would not occur for another 3 to 10 years. Adequate tree seedlings are not present on the site. Given the number and species of healthy trees that still partially occupy the site, over time, seedlings would develop following the completion of the shelterwood seed cut (see description in previous subsection).

A third type of shelterwood removal cutting would occur under more normal conditions (not associated with significant decline, and referred to as "green" in the table). If tree seedlings already exist, the

removal cut would occur within the next two to three years. If they do not exist, it would occur within 3 - 10 years as soon as adequate tree seedlings develop (Horsley in Marquis 1994b, p. 224).

In order to provide the vegetative structure that will promote wildlife habitat, and maintain uncommon or minority tree species, mitigation measures WL 11&13 (see mitigation list) will be included in all stands proposed for removal cutting.

Clearcut and Salvage Clearcut in Alternatives 1 and 3 - Clearcutting is prescribed on 196 acres (43% is salvage) in Alternative 1 and on 124 acres (68% is salvage) in Alternative 3 (see Table 59). There are 9 acres of clearcutting in Alternative 4 designed to achieve wildlife habitat improvement objectives (wildlife openings).

Standard clearcutting (referred to as "green" in Table 59) is a regeneration method used to establish even-aged stands whereby all trees except residuals designated according to mitigation measures, are removed in one harvest. "Green" clearcut areas are moderately to well-stocked (relative density >40%) with live, healthy trees before harvest. Salvage clearcuting is prescribed where the relative density of the healthy tree component of the stand is expected to drop to or below 40% during the next five or ten years.

Clearcutting normally is used where adequate tree seedlings are already present on the forest floor (Horsley in Marquis 1994b, pp. 219 & 221); there is no need to conduct a shelterwood harvest to initiate tree seedling development (i.e., one harvest is optimal). Clearcutting on the ANF does not rely heavily on dormant seed in the leaf litter because the area will have tree seedling cover before, during, and immediately following the harvest. (USDA-FS 1986a, pp. D-2, D-7; USDA-FS 1986, p. 4-17).

White-tailed deer cause extensive damage by feeding on Allegheny hardwood and Northern hardwood tree seedlings. Only even-aged methods that provide abundant sunlight enabling seedlings to quickly grow out of the reach of deer are practical. Even then, reforestation practices (such as fencing, fertilization, and site preparation) are often necessary. The choice of silvicultural systems would be wider were it not for the unusually high deer browsing on the ANF. Clearcutting provides the optimal response. (USDA-FS 1986a, pp. D-7 to D-9) In one step, it provides abundant sunlight to existing tree seedlings permitting them to rapidly develop.

Clearcutting is the optimum method for maintaining aspen due to its intolerance for shade and its physiological requirements for suckering. Both seedlings and root suckers are intolerant of shade. Those that fall below the canopy stop growing and die within a few years (USDA-FS 1986a, p. D-6). There are 5 acres of aspen clearcutting included in Alternatives 1 and 3.

Intermediate Thinning and Salvage Thinning in Alternatives 1 and 3 - In Alternative 1, there are 4,243 acres of thinning (58% salvage). Alternative 3 contains 4,690 acres (78% salvage). There is no thinning in Alternative 5.

Intermediate thinnings (referred to as "green" in Table 59) are designed to harvest trees which are of poor quality, at risk of dying during the next 5 to 10 years, or to reduce stocking in highly stocked stands in order to enhance residual tree survival or to concentrate growth on the best trees. Some healthy appearing trees may be cut to provide additional growing space for trees nearby. The trees that remain following harvest will consist primarily of larger diameter trees with healthy crowns and adequate growing space. Under normal conditions, the average relative density of the residual stand would be 60% to 70%. Normally, no more than one-third of the trees in the stand would be removed in a single harvest entry. (USDA-FS 1986, p. 4-25 & USDA-FS 1986a, p. D-7; Marquis 1994b, pp. 247-252) Less than half of the harvest volume consists of dead or high-risk trees.

Salvage thinning occurs when more than half of the volume harvested consists of dead or high-risk trees that would die within the next 5 to 10 years. Residual stand density could be as low as 40%, depending on the amount of dead/declining trees present.

Almost all sites proposed for thinning treatment presently have interfering understory conditions of fern, grass, beech and striped maple (see Table 60). Since we are not trying to establish regeneration with this treatment, there generally are no treatments proposed to eliminate or reduce interfering vegetation. Existing understory conditions are not expected to change substantially in Alternatives 1 and 3 (see Table 60).

Table 60. Summary of Acreage Proposed for Thinning Where Interfering Plants are Abundant Enough to Restrict other Plant or Seedling Development

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Percent of thinning acres having abundant interfering plants	86%	98%	91%	97%	0
Total Thinning Acres	***4,243***	***4,219***	***4,690***	***2,473***	***0***

Implementation of the mitigation measures WL 10&12 (see mitigation list) will help to ensure that species composition or overall diversity will not be reduced as a result of the proposed treatments.

Modified Salvage Thinning in Alternatives 2 and 4 - Alternative 2 contains 4,219 acres (100% salvage) of salvage thinning and Alternative 4 contains 2,473 acres.

Unlike the salvage thinning discussed above for Alternatives 1 and 3, salvage thinning in this instance is designed so that no healthy appearing trees would be harvested. The only trees cut would be those that are already dead or would be expected to die within the next 5 to 10 years. The residual stocking level may be quite low – especially in stands where salvage regeneration harvests are proposed in Alternative 1. This poorly stocked condition would persist for an extended period of time (or perhaps decline even more if additional tree mortality occurs) since few tree seedlings exist or are expected to develop. Table 59 shows acres of salvage harvest under this alternative.

Ninety-eight percent of the sites proposed for thinning in Alternative 2 (97% in Alternative 4) presently have interfering understory conditions of fern, grass, beech and striped maple (Table 60). Since we are not trying to establish regeneration in Alternative 2, there are no treatments proposed to eliminate or reduce interfering vegetation. Existing understory conditions are not expected to change significantly. In Alternative 4, stands salvage thinned where the relative density of healthy trees is below 40%, would receive reforestation treatments to control interfering plants. In those areas, herbaceous plant composition should improve in areas treated with herbicide.

Standard and Salvage Two-Aged Harvest in Alternatives 1 and 3 - Two-aged harvesting is proposed on 385 acres (57% is salvage) in Alternative 1 and on 255 acres (69% is salvage) in Alternative 3 (see Table 59). The treatment is termed "salvage" when the relative density of healthy trees dominating the site drops below 40%. When the relative density of healthy trees is 40% or higher, the treatment is considered standard two-aged or "green".

Adaptive Management - Some vegetative and wildlife goals necessitate the development of modified techniques which blend existing and evolving research findings with modified management approaches. We use adaptive management when sufficient information is already available to help develop these solutions, but some uncertainty exists. Carefully monitoring preliminary results and being flexible in

applying subsequent actions can attain successful management objectives attained while furthering overall knowledge. (USDA-FS 1998a, p. 84) East Side adaptive management practices include two-aged management.

Two-aged harvest is a modified even-aged harvest treatment. It could provide a compromise between even-aged and uneven-aged management in stands dominated by both overstory and seedling species that are moderately shade tolerant (red maple, birch, etc.) or perhaps intolerant. The concept is to maintain two age-classes on a particular site, with their ages one-half rotation apart. If the rotation is eighty years, initiate this treatment by applying a standard shelterwood cut with supporting mechanical or chemical site preparation. Once adequate seedlings become established, cut back to the final stocking level of the older age class, leaving a relative density of 20 to 25 percent (Stout, personal communication). The older age class will be retained for the entire rotation. The younger age class and individuals from the older group may be thinned later in the rotation. At the end of the rotation, the entire older age class would be harvested and 20 – 25 % of the younger age would be retained to be the new age class.

The required number of snags and den trees per acre are left on the site, but in addition, a number of well-formed small sawtimber sized trees are left. These "leave trees" provide added vertical and horizontal diversity to the site. They also serve as a seed source for the second age class, if it is not already present. They may cast sufficient shade to substantially affect long-term development and quality of shade intolerant species

It should be noted that a two-aged harvest may have some silvicultural drawbacks. They have not been used extensively locally. Trees grow more slowly in partial sunlight and are thus exposed to deer browsing longer. Stem quality may also be substantially lower. There is a risk that the trees in the older age class may not survive through the second rotation. The risk of regeneration failure is greater, and successful regeneration takes longer to achieve. Partial sunlight and deer browsing favor tree species more tolerant to shade and less desirable to deer as food, such as beech, striped maple and black birch. Consequently, two-aged harvests are used as an adaptive management technique. To determine the effectiveness of two-aged harvests, a representative sample of two-aged units will be monitored in an administrative study (see mitigation measures).

Implementation of the mitigation measures WL 10-13 (see mitigation list) will help to ensure success based on what we know now about this management practice.

Effects of Uneven-aged Management

Forest Plan analysis for the Allegheny National Forest took a very detailed look at the option of implementing uneven-aged management on a large scale on the ANF. The assignment of management areas, by their basic nature, sets guidelines on the breadth of consideration individual projects within those management areas should give to uneven-aged management. The results of implementing the Forest Plan during the last 13 years also provide an important context which helps frame the range of reasonable options for considering and implementing uneven-aged management locally. Has uneven-aged management been successful? Actually, reforestation success with uneven-aged management has been very marginal, whereas results with even-aged management have been quite good (USDA-FS 1998a, pp. 18 and 86). Large scale implementation is not consistent with the objectives of certain management areas established by the Forest Plan, and it does not seem prudent until more is known about how to develop adequate tree seedlings of appropriate species.

From Table 58, we learned there are 2,723 acres (32%) of the total 8,223 acres proposed for treatment in this project that have the biological characteristics which make uneven-aged management potentially feasible. Alternative 4 considers the most uneven-aged management of any alternative. It evaluates UEAM on 2,692 acres (99%) of the total area where it is biologically feasible (see Table 61). In addition,

three of the Alternatives include UEAM on 172 acres dominated by species or conditions that are not conducive to UEAM, but they are in MA 2 where UEAM is the featured silvicultural system. These treatments will be carefully monitored through adaptive management as a local test of its feasibility or results on these kinds of sites.

Table 61. Summary of Types of Sites where UEAM is Prescribed for Each Alternative

Alternative	Sites Meeting Biological Criteria for UEAM [1]	Sites Do Not Meet UEAM Biological Criteria	Total
1	274	172[3]	446
2	0	0	0
3	205	172[3]	377
4	2,692[2]	172[3]	2,864
5	0	0	0

1 Sites which lend themselves to UEAM, based on the biological capability of the tree species present, include those which have adequate stocking of beech seedlings or ≥ 35 Basal Area per acre of shade tolerant tree species.

2 Excludes 29 acres which meet UEAM criteria but only reforestation treatments, no harvest, are prescribed.

3 All of these acres are in MA 2. Individual tree selection is prescribed on 64 acres and group selection on 108 acres.

Riparian, Wet Soil, and Visually Sensitive Areas Proposed for Treatment

In MA 3.0 (Forest Plan 4-87), uneven-aged management may be an option on inclusions such as riparian areas, wet soils, or visually sensitive areas. Its use will be based on individual site analysis. In MA 2.0 (Forest Plan p. 4-116), it will be used where cutting is planned in visually sensitive areas to provide a continuous canopy or visual variety in recreation travelways and use areas.

Uneven-aged management will be used to benefit wildlife by increasing mast and browse production, improving tree species composition and diversity, and increasing vertical habitat diversity.

Table 62 displays the types and amounts of treatments proposed in riparian zones, areas with wet soils, and visually sensitive areas for the East Side project. Total acres proposed for treatment range from 840 acres in Alternative 1 to a low of 415 acres in Alternative 2. Acres proposed for treatment in Alternatives 3 and 4 are similar (513 and 477, respectively). All of the harvest treatments in Alternatives 2 and 4 are partial harvests. In Alternatives 1 and 3, 79% and 71% of the harvests are partial, respectively. Over half of these treatments are proposed in visually sensitive areas.

As mentioned above, uneven-aged management may be an option on inclusions, such as riparian areas, wet soils, or visually sensitive areas. Only 846 acres (10% of total harvest acres) of these kinds of sites are proposed for harvest activity as part of this project (see Alternative 1 in Table 63. Other alternatives propose treatment on a much smaller acreage. Uneven-aged management is evaluated in detail on the portion (240 acres or 28%) of these areas where it is biologically feasible.

Table 62. Summary of Vegetative Treatments Proposed in Riparian Zones, Wet Soil (Soil Group III), and Visually Sensitive Areas Within the East Side Project Area

	TREATMENT BY ALTERNATIVE									
	ALT 1		ALT 2		ALT 3		ALT 4		ALT 5	
TREATMENT	**Green**	**Salv**[2]	**Green**	**Salv**[2]	**Green**	**Salv**[2]	**Green**	**Salv**[2]	**Green**	**Salv**[2]
Commercial Timber Harvest (even-aged)										
Clearcut	14*	18			12*	18	9*			
Shelterwood seed cut followed by shelterwood removal cut	47	94			30	80				
Shelterwood removal cut		11				11				
Delayed shelterwood removal cut	11	15			11	15				
Intermediate thinning	29	23		4	73	20		225		
	0	9		15		4				
Total Even-age Mgmt.	***362***	***377***		***415***	***126***	***328***	***9***	***225***		
Commercial Timber Harvest (two-aged)										
Two-age Prep Cutting followed by two-age cutting	33	26			3	14				
Two-age cutting		41				41				
Total Two-aged Mgmt.	***33***	***67***			***3***	***55***				
Commercial Timber Harvest (uneven-aged)										
Group Selection Cutting										
Transition Cutting										
Individual Tree Selection		1				1	43	197		
Total Uneven-age Mgmt.		***1***				***1***	***43***	***197***		
Total Harvest	***395***	***445***		***415***	***129***	***384***	***52***	***422***		
Total Green and Salvage Harvest	***840***		***415***		***513***		***474***			
No Harvest - Reforestation Only		***6***				***30***		***43***		

1 - "Green" final harvests are those conducted where stands are moderately to well-stocked with healthy trees (relative density > 40%). "Green" thinnings occur when more than half of the volume harvested consists of live, healthy trees.

2 - Salvage (salv) harvests consist of three types: 1) intermediate harvests in healthy stands where more than half of the volume removed consists of dead trees or trees at risk of dying, 2) final harvests in stands poorly stocked with healthy trees (relative density < 40%), and 3) in Alternatives 2 and 4, intermediate treatments in poorly stocked stands where the volume removed is dead or at risk of dying and the residual stand will remain poorly stocked.

** - Consists of wildlife opening development and aspen regeneration cutting.*

Table 63. Acreage Summary for Riparian Zone, Wet Soil (Soils Group III) and Visually Sensitive Areas Occurring Within Sites Proposed for Treatment In the East Side Project Area

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Total Treatment Acres	8,223	4,220	5,810	5,966	0
Treated Areas Having No Special Sensitivity	7,377	3,729	5,267	5,446	0
Treated Areas with Special Sensitivity	846	491	543	517	0
• Riparian[1]	102	59	65	66	0
• Wet Soils (Group III)[1]	299	196	114	157	0
• Visually Sensitive[1]	446	245	365	298	0
Treated Areas with Special Sensitivity	846	491	543	517	0
• UEAM Evaluated in Detail[2]	1	0	1	240	0
• UEAM Not Evaluated in Detail	845	491	542	280	0

1 - These three special sensitivity categories listed are not mutually exclusive...therefore, acres listed are not additive.
2 - Sites were evaluated in detail for uneven-aged management because they have biological conditions that make UEAM reasonable to consider.

In order to reasonably maximize the evaluation of uneven-aged management on a larger acreage where it may be feasible, Alternative 4 includes detailed consideration on sites where it may be biologically feasible outside of these areas of special sensitivity. The ID Team has completed this evaluation even though MA direction features even-aged management. Ninety-two percent of the treatment (5,966 acres) proposed in Alternative 4 is outside of these special areas (see Table 64).

Table 64. Sites Evaluated for UEAM - Summary of Acreage Distribution Between Areas With and Without Special Sensitivity

		Portion of Sites Within Areas of Special Sensitivity		Portion of Sites Outside Areas of Special Sensitivity	
Alternative[1]	Total Acres	Acres	%	Acres	%
1	446	1	0	445	0
3	377	1	0	376	0
4	2,864	240	8	2,624	92

[1] No UEAM is prescribed in Alternatives 2 and 5.

Status of Interfering Plants in Stands Prescribed for Uneven-aged Management

Interfering plants, such as fern, grass, and striped maple, are abundant on the sites proposed for uneven-aged treatment. In all of the alternatives, these species occupy close to 90% of the sites proposed for uneven-aged management (see Table 65). These plants interfere with seedling development, particularly sugar maple and hemlock, just as they do for even-aged management. Because sugar maple and hemlock grow slowly and are preferred as deer browse, it is especially important to control interference when practicing uneven-aged management.

Site-specific conditions within the East Side project area, current local and regional knowledge regarding the local feasibility of implementing uneven-aged management, and Forest Plan direction used to determine where uneven-aged management is a viable management option for this project.

Table 65. Interfering Plants in Stands Prescribed for UEAM[1]

	Alt 1		Alt 3		Alt 4	
Total acres prescribed for UEAM	446		377		2,864	
	Acres	%	Acres	%	Acres	%
Type of Interference						
Fern/Grass	400	90	367	97	2,422	85
Striped Maple	0	0	0	0	440	15
Any Interference	421	94	377	100	2,664	93
None[2]	25	6	0	0	200	7

1 *Alternatives 2 and 5 contain no Uneven-aged Management. Acres shown in each category represent stands where ≥ 30% of the plots are ≥ 30% covered with interfering plants.*

2 *None means < 30% of the plots are ≥ 30% covered with interfering plants*

Activities

Standard and Salvage Individual Tree Selection - This treatment is proposed for 158 acres (25% salvage) in Alternative 1, 89 acres (13% salvage) in Alternative 3, and 2,594 acres (66% salvage) in Alternative 4 (see Table 66). Salvage individual tree selection occurs when more than half of the volume harvested consists of dead or high-risk trees that would die within the next five to ten years. Standard or "green" harvest occurs when more than half the trees harvested are healthy.

Table 66. Uneven-aged Treatment Summary by Alternative

	TREATMENT BY ALTERNATIVE									
	ALT 1		ALT 2		ALT 3		ALT 4		ALT 5	
TREATMENT	**Green**	**Salv**	**Green**	**Salv**	**Green**	**Salv**	**Green**	**Salv**	**Green**	**Salv**
Type of Uneven-aged Treatment										
• Group Selection Cutting	154	115			154	115	154	115		
• Transition Cutting	18				18					
• Individual Tree Selection	118	40			77	12	870	1,724		
Total Uneven-age d Management	***290***	***155***			***249***	***127***	***1,024***	***1,839***		

Individual tree selection is designed to remove individual trees, creating very small gaps in the canopy and favoring establishment of tree seedlings tolerant of shade. Planned openings created generally do not

exceed 0.1 acre (USDA-FS 1986a, p. D-2). When a series of such cuts are each successful, they promote development of a stand with many different age classes, i.e. an uneven-aged stand (USDA-FS 1986a, p. 4-26). Each selection cut, generally 15 to 20 years apart, is designed to create small temporary gaps in the forest canopy. This increases the amount of sunlight that reaches the forest floor, causing seeds to germinate and stumps to sprout. Individual tree selection cuts perpetuate shade tolerant tree species, such as hemlock, sugar maple, or American beech that generally are of lower commercial value (USDA-FS 1986, p. 4-29). Green harvests in this category generally result in an average relative density of 60% following the harvest (Stout in Marquis 1994b, p. 337), whereas in a salvage harvest it could drop lower than 40%.

The long-term effect of individual tree selection is to create relatively little horizontal diversity between stands across the landscape. However, if deer browsing is controlled, vertical vegetative diversity within each stand is high. Deer browsing and interfering plants can have a dramatic effect on the success of uneven-aged silviculture. (USDA-FS 1986, pp. 4-27 to 29) Appropriate reforestation practices must be prescribed to ensure reforestation success at every entry (i.e., every 15 to 20 years).

In fact, "there is no assurance that uneven-aged management can be used successfully in any region where deer populations are high. The success of selection cutting depends on the establishment of a new age and size class at each cut, and eventual growth of these stems into the main crown canopy. The long period of slow growth in the understory, however, greatly increases the length of time that seedlings are subjected to deer browsing, compared to those under even-aged management, and the small openings created by group selection are very attractive to deer. In addition, deer seem to browse preferentially on those species that would otherwise be favored by the selection system. There are many locations where reproduction simply cannot be obtained. Unfortunately, regeneration failures are not nearly so apparent under selection cutting, and it is possible to apply three or four selection cuts before it becomes obvious that you are running out of trees. So special care should be taken to monitor the progress of age class replacement if uneven-aged management is used in areas of moderate to heavy deer population. " (Stout in Marquis 1994b, p. 334)

"Interfering plants further complicate this story. The selection system depends on successfully bringing through an age-class from each entry to the stand. When we treat interfering understories in an even-aged stand, we eliminate existing advanced reproduction along with interfering plants. Then we count on the post cutting conditions to favor germination of numerous seedlings that can outgrow the returning fern, grass, or weed species in the full light after even-aged overstory removal. We cannot afford to eliminate the existing small trees from the last cutting cycle, nor can we expect fast growth from new seedlings in the perpetual partial shade of the selection system. So, interfering plants need to be assessed carefully in selecting stands to be managed under this system." (Stout in Marquis 1994b, p. 334)

Uneven-age management does not create large blocks of early seedling-sapling stages. Horizontal diversity may develop within stands, however the diversity between stands (as would develop with the application of even-age management) does not occur.

Individual tree selection will involve removal of more common species such as red maple, black cherry, and birch, as well as salvage removal of dead and dying sugar maple, beech and ash. Remember that all of the stands proposed for treatment in this project are even-aged. In such situations, "an adjustment period is required to establish a stable uneven-aged condition with the desired distribution of ages and tolerant species; this adjustment period may require two or three cuts spanning 30 to 50 (or more) years. So, most uneven-aged management practiced during the foreseeable future will involve stands in this transition from an even-age condition to an uneven-age condition. A fully stabilized uneven-aged stand will not be obtained until most of the intolerants have been replaced by new age classes of tolerant stems in all size classes." (Stout in Marquis 1994b, p. 334)

Transition Cutting and Salvage Transition Cutting - Transition cutting is proposed on 18 acres in both Alternatives 1 and 3 (see Table 66). There is no salvage transition cutting in this project.

These treatments are referred to as transition cutting because one of the objectives of this harvest is to start to create an uneven aged structure in an even aged stand or to transition these stands from even-aged to uneven aged management. These treatments will result in the removal of trees from the suppressed, intermediate, co-dominant, and dominant crown classes to allow more sunlight to reach the forest floor. Like a shelterwood treatment, the additional sunlight and growing space enables new tree seedlings to become established. Over time, a series of similar cuttings will create multiple vigorous age classes within the stand (Nyland, 1998, p. 18-21).

The increase in sunlight is also expected to result in increased growth of herbaceous vegetation on the forest floor. Transition and salvage/transition cutting are expected to result in establishment of primarily mid-tolerant and shade intolerant species such as birch, red maple, black cherry and white ash and are expected to establish fewer shade tolerant species such as beech, sugar maple and hemlock (though cultural treatments would be designed to favor these shade-tolerant species). Effects of these two treatments are similar, except that salvage transition cutting will be done in stands where there is existing mortality and will include the salvage of existing dead and dying trees in combination with some healthy trees. "Green" transition cutting includes the cutting of primarily healthy trees in stands not affected by recent mortality.

In order to maintain uncommon or minority tree or shrub species, and to provide habitat structure and diversity associated with standing dead wood, these structural components would be left as residual trees after cutting (USDA-FS 1986a, p. 4-6; Appendix D, mitigation measures WL 10 & 12).

Group Selection and Salvage Group Selection Harvest - Group selection harvest is proposed on 269 acres (43% salvage) in Alternatives 1, 3, and 4 (see Table 66). Salvage group selection cutting occurs when more than half of the volume harvested consists of dead or high-risk trees that would die within the next 5 to 10 years. Residual stand density could be as low as 40%, depending on the amount of dead/declining trees present.

Group selection involves harvesting trees in small groups (up to 0.5 acre in size [USDA-FS 1986a, p. D-2]) as well as harvesting individual trees between the groups (Stout in Marquis 1994b, p. 333). Groups would occupy 15% to 20% of each site. The groups would normally be purposely located where tree seedlings are already established in order to assure reforestation success for the same reasons discussed above for clearcutting and shelterwood removal cutting.

Within the groups, enough sunlight may reach the forest floor to promote the development of some shade intolerant and mid-tolerant tree species. However, most of the tree seedlings that will thrive within these groups will likely be of intermediate tolerance (Stout in Marquis 1994b, p. 334). Regular harvests in this category generally result in an average residual relative density of 50% (Stout in Marquis 1994b, p. 338), whereas salvage harvests could result in an average relative density as low as 40%.

Between the groups, mid-tolerant and intolerant tree seedlings that do develop are expected to decline or die over time (or be of lower quality) as the remaining canopy closes and prevents adequate sunlight from reaching the forest floor. Over the long-term, only beech regeneration or perhaps a few hemlock or sugar maple seedlings/saplings (where deer populations are lower and site nutrient conditions are adequate) are expected to survive between groups. Stands receiving this treatment are expected to develop increasing levels of beech.

Ash, red maple, birch and black cherry would be the dominant tree seedlings within the groups. Dale et al (1995) found that shade-intolerant species only persist near the centers of larger groups. In the stands within this project area, that would mean, over the long term, that ash and cherry would thrive only in the

small central portion of the group that receives abundant sunlight. Red maple and other mid-tolerant species would thrive in a somewhat larger portion of the opening, but shade tolerant species (hemlock, beech, sugar maple) would dominate most of the site. The shade-intolerant and some shade mid-tolerant trees that develop in the shadier portion of the opening are expected to either die or be of poor form or quality. (USDA-FS 1986, p. 4-29) Over the long-term, this shift in species composition is expected to substantially reduce the quality and value of future hardwood products in these stands.

All of the 269 acres proposed for group selection are in Management Area 2 (see Chapter 2, Table 5, Table 10, and Table 13). Ninety acres (33%) are Northern hardwood stands that presently contain a large beech component. Forty-eight acres (18%) are presently Allegheny hardwood and are dominated by shade intolerant black cherry trees, and 131 acres (49%) are upland hardwood dominated by red maple, some black cherry and birch, and a smaller beech component. While the species composition of the Allegheny hardwood and upland hardwood stands may not lend these areas to uneven-aged management, these areas constitute an adaptive management approach to further test the local feasibility of group selection.

Reforestation Activity in Stands Prescribed for Uneven-aged Management

Reforestation activity is just as critical with group selection as it is with individual tree selection or even-aged management (USDA-FS 1986, p. 4-38).

Table 67 shows that a substantial amount of reforestation treatments may be required in order to have a chance of successfully establish tree seedlings in these even-aged stands where we are prescribing uneven-aged management. Alternative 1 prescribes an average of 2.6 acres of reforestation activity per acre of uneven-aged management. That is, several treatment activities must be performed on the same acre. In Alternative 3, that average rises to almost 2.9 acres per acre of UEAM, and in Alternative 4 it drops to 1.2 acres per acre of UEAM. Alternative 4 is lower because beech seedlings are present on close to half of the areas, and beech is an acceptable species under this silvicultural system in this Alternative. While it is an acceptable species, with the looming threat of beech bark disease serious questions exist regarding the potential for substantial amounts of it to grow above the small sawtimber stage into larger trees. In Alternatives 1 and 3, beech is not considered an acceptable seedling/sapling species due to potential beech bark disease impacts, and additional expense is necessary to obtain other acceptable species. Recent experience on the ANF indicates tree seedling development on sites managed uneven-aged is very marginal (USDA-FS 1998a, p. 17 & 86).

Table 67. Acres of Reforestation Activity in Stands Prescribed for UEAM

Activity	Alt 1	Alt 3	Alt 4
Total Acres Prescribed for UEAM	446 Ac	377 Ac	2,864 Ac
Herbicide	262	262	1,450
Site Preparation/Striped Maple Removal	349	349	1,576
Planting	135	135	123
Site Preparation for Natural Regeneration	0	0	0
Fencing	160	160	110
Release	344	344	344
Total	***1,250***	***1,250***	***3,603***

** Alternatives 2 and 5 contain no Uneven-aged Management.*

Effects of Reforestation and Vegetation Restoration Treatments

Reforestation and vegetation restoration treatments proposed under Alternatives 1, 3, and 4 largely respond to the forest ecosystem health issues described in Chapters 1 and 2. In a healthy, sustainable forest ecosystem, tree seedlings, herbaceous vegetation and shrubs develop naturally whenever suitable light conditions are created on the forest floor. When overstory trees die, young tree seedlings germinate and grow to replace them, thus helping to ensure a well-forested condition is maintained on the site. Since we know that tree seedlings (and shrubs) do not usually develop on their own on the ANF (Horsley in Marquis 1994b, pp. 207-215; USDA-FS 1995a, p. 26), the following understory treatments will be implemented in order to promote the development of desired tree seedlings, herbaceous vegetation, and shrubs. They are particularly important on sites where tree mortality is heaviest and tree seedling development is the poorest. The amounts of these proposed treatments are displayed by alternative in Table 59. The following is a discussion of the anticipated vegetative effects from each of these types of treatments.

Activities

Hardwood, Shrub, and Conifer Planting - Table 59 displays the planting activity proposed for each alternative. These treatments include planting of native woody shrubs (such as viburnums), native hardwood trees, hemlock, red pine, and white pine. Planting is proposed in openings and in some forested stands where overstory tree stocking is low. The objective is to restore the native shrub and the conifer component that has been affected by deer browsing. Hardwood planting is proposed on a number of sites which are poorly stocked with trees to supplement the sparse natural regeneration in order to help maintain forest cover. The number of trees varies according to the needs of each individual site at the time of planting.

Planting will increase the number and abundance of plant species on individual sites. Regionally, there will be no increase in the number of plant species because no new species will be introduced. Additional details regarding planting can be found in the Forest Plan (USDA-FS 1986a, p. 4-16, p. D-14, and pp. 4-90 through 93) and the Forest Plan FEIS (USDA-FS 1986, p. 4-43). Since planted stock is generally less than two feet in height, no short-term benefits are anticipated. However, over the long-term (>20 years), these treatments are expected to improve stand stocking, structure, and composition, as well as help to meet wildlife objectives through improved cover/forage conditions in the treated stands.

Herbicide Application - Table 59 displays the herbicide treatment activity proposed in each alternative. Ground application of herbicides is proposed in stands which lack adequate numbers of tree seedlings and which contain dense coverages of grasses, fern, beech root suckers and striped maple (Horsley in Marquis 1995, p. 231). This treatment would occur on sites where we are trying to establish new tree seedlings in order to perpetuate well-stocked forest cover or where final harvest activities are planned to establish young, even-aged stands. It may also be used to prepare sites for wildlife plantings (USDA-FS 1991, Chapter 1, p. 3 and Chapter 2, pp. 2 & 3). Sulfometuron methyl or glyphosate (or a combination of the two) is used during the latter part of the growing season (mid-July through mid-September) to control these plants.

Application rates and specific effects of herbicide application on aquatic and terrestrial ecosystems are discussed at length in Chapter 4 of the ANF Understory Management EIS, in the Forest Plan FEIS (beginning on p. 4-37), and in the Forest Plan (beginning on p. D-15). In addition, the ANF Summary of Responses to Project or IPS Appeal Points Relating to Herbicide Use (USDA-Forest Service, 1992) provides a further summary of effects on non-target organisms and vegetation.

Herbicide treatment would not directly affect overstory vegetation since herbicide would only be applied to and taken up in significant quantities by understory species. Herbicides aid tree seedling, shrub, and forb establishment and growth that fosters the development of younger, more diverse, forested areas. Herbicides control ground and some midstory vegetation that interfere with this process. Abundant tree seedlings, shrubs and forbs would have the opportunity to develop beginning the season after application. (USDA-FS 1991, pp. 4-13 and 4-14).

Wildlife are mainly affected by habitat shifts, not from toxic affects of the spray mixture. The immediate effect of removing the dense ground vegetation layer will be decreased habitat. More than a decade of herbicide treatments and monitoring (USDA-FS 1998a, pp. 21-24, 73-74) on the ANF has shown that a diverse understory of woody and herbaceous species re-inhabit the site within two or three growing seasons.

Sizes of Herbicide Treatment Areas - The ANF FEIS for Understory Vegetation Management (USDA-FS 1991, p. 5-3) mitigates potential visual effects from treating large areas with herbicide by limiting the size of the treated area to the maximum final harvest size for each Management Area (40 acres in MA 3.0, no limit in MA 2.0). There are eight individual stands larger than 40 acres where herbicides will be applied in Alternatives 1, 3 and 4 (Table 68). They range in size from 41 to 62 acres. In addition, there are 13 blocks (aggregates of adjacent stands) larger than 40 acres where herbicides will be applied in Alternatives 1, 3, and 4. Block sizes range from 41 to 215 acres. Treatments are proposed in combination with both even-aged and uneven-aged regeneration harvests, and in stands where no commercial harvest is proposed in Alternatives 1 and 3. Treatments are proposed in combination with uneven-aged regeneration harvests and in stands where no commercial harvest is proposed in Alternative 4.

Table 68. Herbicide Treatment Areas which Potentially Could Exceed 40 Acres

Herbicide Block ID	Alts 1 & 3	Alt. 4
H1	96	93
H2	41	41
H3	82	82
H4	215	215
H5	56	56
H6	66	66
H7	103	103
H8	49	49
H9	41	41
H10	67	67
H11	52	52
H12	80	80
H13	114	114

Treatment of large land areas will be reduced by staggering the timing of herbicide application in the 13 blocks in Alternatives 1, 3 and 4 over several years. The amount of herbicide application within one operating season will be limited to a maximum of 40 contiguous acres, except where individual stand size exceeds 40 acres. This would effectively minimize visual impacts since ground vegetation develops on the site the year following treatment (USDA-FS 1991, p. 4-14 & 4-15).

Fertilization - Table 59 displays the fertilization activity proposed for each alternative. Fertilization generally involves the aerial or ground application of nutrients usually during the month of May. The immediate result is usually a dense thicket of fast growing tree seedlings beyond a height at which deer

can browse them. These seedlings naturally thin themselves, though some may also require a release treatment (see below) to help maintain tree species diversity on the site.

Fertilizer is used primarily on the Allegheny hardwood type or where black cherry seedlings are abundant since other tree species do not respond as well to it. (USDA-FS 1986, p. 4-41-42; USDA-FS 1986a, p. D-14, 4-18; Horsley in Marquis 1994b, p. 234-236) This treatment is generally used only on unfenced stands that are more susceptible to deer browsing.

The Forest Plan contains a standard and guideline on page 4-25 addressing buffer strips during fertilization. From a water quality standpoint, a fertilization project was monitored on the ANF in 1991 to determine if a buffer strip was adequate to prevent the movement of fertilizer from a nearby treatment area into an adjacent stream. During the project in 1991, a buffer of approximately 150' was maintained between the spray unit and a nearby stream. The results of the water quality analysis showed low levels of nitrate-nitrogen and total phosphate throughout the sample period (including the pre-treatment), indicating adequate buffering.

Area Fencing or Individual Tree Fencing - Area fencing does not eliminate deer browsing (since a few deer inevitably breech the fence) but reduces it to a level that won't adversely affect most tree seedlings, shrubs, or herbaceous vegetation. A dense layer of seedlings, shrubs, and herbaceous vegetation is expected to develop inside the fenced area if there are few interfering plants.

Experience on the ANF shows that where a variety of tree seedling species exists, area fencing can also greatly increase herbaceous and woody plant species diversity and abundance, as well as improve future stand structure. (USDA-FS 1986, p. 4-42; Horsley in Marquis 1994b, pp. 236-238; USDA-FS 1986a, pp. D -14, 4-17) Fencing is an important part of both even-aged and uneven-aged management so the amount of fencing in each alternative (see Table 59) varies depending on the amount of harvest.

Small woven-wire fences around clumps of planted stock (cribs) or protective plastic tree shelters provide planted tree seedlings protection from deer browsing and provide a microclimate that serves as a miniature greenhouse to enhance seedling survival and growth. Though the plastic tree shelters are supposed to biodegrade, most recent, local results indicate they will have to be removed by hand when their purpose is served.

Release - Table 59 displays the acres of release treatment proposed for each alternative. These treatments all involve the non-commercial mechanical cutting of tall-growing woody vegetation (generally of seedling or sapling size) that interferes with the tree seedlings, saplings, or shrubs (either naturally occurring or planted) desired on the site. The treatment can be used to regulate species composition to those species best suited for either even-aged or uneven-aged management. Release can also promote growth and survival of species not common on the site (such as aspen, oak, ash and cucumber) which are at risk of being killed by species which out grow them, potentially increasing species richness on the site. Release is expected to improve tree species composition in the long term. (USDA-FS 1998a, pp. 26 & 79; Marquis 1994b, pp. 269 and 282)

Release generally is carried out when stands are between 5 and 20 years (or perhaps 30 years) of age, depending upon site specific stand development patterns, weather conditions, and deer browsing effects. Release work helps ensure desired tree species composition in young forested stands as well as the development of future forested stand conditions.

It is important to note that in many cases it is difficult to forecast whether release will be needed following a series of other reforestation and harvest treatments which may take three to ten years to complete. Substantially more acres may need release than shown on Table 59. The final need for release will be determined based on site-specific surveys conducted at appropriate times during the stand regeneration process.

Site Preparation for Natural Regeneration & Site Preparation/Striped Maple Cutting - Site preparation for natural regeneration would be completed on many sites proposed for either even-aged or uneven-aged regeneration. If conducted before the final harvest cut, it involves the cutting of mid-story beech, striped maple, or other selected woody species in order to reduce shading and promote development of tree seedlings. These small trees are usually 5 to 30 feet tall. (If the treatment focuses primarily on cutting striped maple, either in lieu of herbicide treatment or in preparation for an herbicide treatment, it is called site preparation/striped maple cutting.) Removing a dense or moderate shrub or midstory layer would have a negative effect on midstory nesting birds. The direct impact would be reduced by cutting during the non-nesting season. However, by removing the layers, it improves habitat for those species that require an open midstory. Please refer to the wildlife section for additional information.

If site preparation for natural regeneration is conducted following a final harvest cut, it would involve cutting the same species, as well as poorly formed or severely damaged stems which may interfere with tree seedling development and growth. (USDA-FS 1986a, pp. 4-17, D-15; USDA-FS 1998a, p. 26; Marquis et al 1992, pp. 4 & 65) Trees specially designated for retention on the site would not be cut. The amount of site preparation varies with the amount of even-aged or uneven-aged regeneration cutting proposed in a particular alternative (see Table 59).

Reforestation Activity in Thinning Treatment Areas

Alternatives 2 and 5 include no reforestation activity. In Alternatives 1 and 3, reforestation activity generally occurs in conjunction with shelterwood removal cuts, shelterwood seed cuts, clearcuts, or uneven-aged harvests.

Alternative 4, however, includes a different reforestation strategy (see discussion in Chapter 2). Reforestation activities are prescribed in the uneven-aged harvest areas, just as in Alternatives 1-3. These are the areas that have biological characteristics (adequate beech seedlings/saplings or $\geq$35 basal area of shade tolerant species) that make uneven-aged management reasonable to consider there. Other areas, where biological characteristics are not conducive to uneven-aged management and where stand stocking (relative density) is low, are at risk of not having adequate forest cover over the long term because few tree seedlings are present on the ground to replace the large trees that have died. We know that tree seedlings do not generally develop on their own on the ANF (Horsley in Marquis 1994b, pp. 207 - 215; USDA-FS 1995a, pp. 26-27). With the management philosophy adopted in Alternative 4, these stands will be thinned and reforestation practices (see Table 69) will be conducted to try to help establish tree seedlings so there would at least be an opportunity to maintain continuous forest cover. With the amount of shade that remains on many of these sites (healthy trees would be at 30% to 40% relative density), substantial concern exists about how well the developing seedlings would perform, particularly since they are likely to be mid-tolerant or intolerant of shade. In the event more of the remaining large, healthy, overstory trees die, seedling growth and development is likely to improve. No shelterwood removal cutting or clearcutting is prescribed on these sites in Alternative 4.

Alternative 5 includes no reforestation treatments and no thinnings on these kinds of sites, so there is little chance for seedlings to develop to help maintain continuous forest cover.

Table 69. Reforestation Activity in Stands Prescribed for Salvage Thinning Treatment

Activity	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Total Acres Prescribed for Salvage Thinning	2,466 Ac	4,220 Ac	1,909 Ac	2,473 Ac	0 Ac
Herbicide	5	0	5	937	0
Site Preparation/Striped Maple Cutting	1	0	1	733	0
Planting	5	0	5	128	0
Site Preparation for Natural Regeneration	0	0	0	20	0
Fence	5	0	5	536	0
Release	0	0	0	30	0
Fertilization	14	0	0	0	0
Total	***30***	***0***	***16***	***2,384***	***0***

Sites That Receive Only Reforestation Treatments

Alternatives 1, 3, and 4 contain reforestation treatments in areas where no harvest is proposed. This type of treatment is higher in Alternative 3 than in Alternative 1 because Alternative 3 also includes reforestation treatments on areas that cannot be harvested since they require road construction in order to conduct the harvest. Road construction is not required in order to complete the reforestation treatment.

Alternative 4 includes the most of this type of reforestation treatment. It would occur primarily on areas where tree stocking is low, where stands are at risk of not having adequate forest cover over the long term because few tree seedlings are present on the ground to replace the large trees that have died, and where biological characteristics are not conducive to uneven-aged management. With the management philosophy adopted in Alternative 4, these stands will receive a reforestation treatment (see Table 70) to establish tree seedlings so there is at least the opportunity to maintain continuous forest cover.

With the amount of shade that remains on many of these types of sites in Alternatives 3 and 4 (healthy trees would be at 30% to 40% relative density), substantial concern exists about how well developing seedlings will perform, particularly since they are likely to be mid-tolerant or intolerant of shade. In the event more of the remaining large, healthy, overstory trees die, seedling growth and development is likely to improve. However, without reforestation treatments (Alternative 5), there is little chance for this to happen.

Table 70. Reforestation Activity in Stands Prescribed for Only Reforestation Treatments (No Harvest Cutting)

Activity	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Total Acres with Only Reforestation Treatments	244 Ac	0 Ac	487 Ac	629 Ac	0 Ac
Herbicide	212	0	454	596	0
Site Preparation/Striped Maple Cutting	171	0	378	420	0
Planting	29	0	75	51	0
Site Preparation for Natural Regeneration	0	0	33	39	0
Fence	96	0	304	391	0
Release	35	0	35	35	0
Fertilization	29	0	153	0	0
Total	***572***	***0***	***1,432***	***1,532***	***0***

No Action Alternative (Alternative 5)

Under Alternative 5, no action, there will be no change in the character of the vegetation due to management activities. Changes currently taking place due to maturity or decline will continue. The rate of change will be set by the interaction of natural forces such as additional drought, insect defoliations, or windstorms. Much of the tree vegetation is still in a stressful state, and a new impulse of stressors could again induce accelerated decline.

Where decline is currently severe, change can be expected to occur throughout the current vegetative patterns. Many individual trees presently in decline will die soon or continue to die over the long term. Some currently in decline will survive but their boles and crowns will deteriorate and not function as complete trees. Also, these trees will lose their commercial value as a timber product. Some trees that currently appear to be healthy will be successfully attacked by secondary pathogens, then decline and die. Overall mortality will exceed growth and stocking levels in effected stands will become lower with the passage of time. Declining tops and dying trees will permit more sunlight to reach the forest floor, encouraging expansion and growth in understory vegetation. High-density deer populations will selectively browse understory plants to the extent that only a few resistant species will dominate. Over time, the seed-producing overstory will decline to the point where inadequate amounts of seed will be produced for successful, natural regeneration. At the same time, the dense, deer resistant understory would create poor seed germination conditions or would prevent seedlings from becoming established.

Fern and grass vegetation will persist unless it becomes shaded by woody vegetation such as beech, striped maple, or sweet birch. Where present, this interfering vegetation would control light as low shade which would prevent many seeds from germinating or prevent shade-intolerant seedlings from becoming established. In addition, this vegetation will aggressively occupy the soil. That makes conditions difficult for new seedlings to compete for moisture and soil nutrients. When woody, shrub, or tree vegetation can become established under these conditions, they are usually controlled or eliminated by deer browsing. The exceptions are a few species that are very low in deer browse preference such as striped maple or beech or those with a regeneration strategy, such as sweet birch, that copes well with dense understory vegetation.

Striped maple is a relatively short-lived species. It persists well in shaded conditions and multiplies effectively. If released to full sunlight, it grows rapidly and aggressively for about 30 years. At this point it becomes susceptible to wind or ice damage. Many of these trees die due to mechanical failure of their roots or stems. In this case the tree often re-sprouts from the root or stump and repeats the cycle.

American beech is very tolerant of shade and grows slowly under all conditions. It can become established from seed but most often occupies a site through root suckering or coppice reproduction. Beech was considered a low value but desirable tree for wildlife mast and timber products. Presently an introduced, exotic, scale insect is becoming established in the project area. It creates entry opportunities for several native fungus pathogens. These fungi attack living and dead wood cells that affect translocation, the supply of nutrients, and mechanically weakens the tree. These effects prevent the tree from growing to maturity and often result in early death. In any case, the tree usually has no commercial value. Also, the lack of mature trees or stress from the disease complex severely affects mast production. Nearly all trees are susceptible to the disease, although a degree of resistance often occurs with variation in the population. This causes trees to be affected at different rates and at different sizes. The disease complex spreads and persists more strongly where the density of the beech population increases, as will be the case in this no action scenario.

Sweet birch seed and seedlings have the ability to become established where competition for light and soil is already intense. It is near the midpoint in deer browse preference. However, sweet birch can overcome deer pressure when it becomes established in quantity. Sweet birch (also called black birch) is tolerant of shade and grows rapidly in partial or full sunlight. As birch matures and grows to sawtimber size, it is

often affected by fungus and develops cankers in the main stem. The canker usually substantially reduces the commercial value of the trees and often results in mechanical failure of the stem.

These are the species that would dominate the understory, midstory, and, eventually, the overstory of the resultant forest if no action is taken. When left alone, this form of vegetative succession tends to occur in patterns rather than as a mixture. That is, dense patches of fern, with a sparse overstory or no overstory, tend to appear within dense patches of striped maple, beech, or sweet birch.

In stands where severe mortality and decline has occurred, the residual live trees will also be more susceptible to wind throw. In more fully stocked forested settings, trees tend to resist wind pressure in support of each other. As the number of trees decreases, each individual, remaining tree must withstand on its own, more wind effect. Also, remaining healthy trees will grow broader tops, which will increase wind load. In extremely open forested settings, individual trees are susceptible to wind throw.

Deer resistant vegetation includes mostly ferns, grasses, stripped maple, and beech. Much of the beech present originates from coppice or root sprouts. As it grows, it becomes more susceptible to the effects of beech scale complex.

If deer densities remain high, a loss of biological diversity in both plant and animal species in the long term (>50 years) is expected. Horizontal diversity would decline, unless natural disturbances occurred in the project area. Beech and striped maple can grow into the midstory and contribute toward vertical diversity and habitat structure. Vertical diversity would remain constant in the short term and decline over the long term as current, large overstory trees died out.

If no vegetative management takes place, the age-class distribution would remain the same in the short term. Over time, a patchy forest would develop. Surviving overstory trees would vary in stocking with higher stocking levels on mid to lower slopes. Plateau and transition slope areas would have low or sparse overstories with numerous gaps or openings of up to several acres in size. These open canopy areas would have a mixture of open grass and fern patches, dense mixed or monoculture sapling stands of blocks of striped maple, beech, or sweet birch. The vertical diversity would be somewhat diverse between the overstory and developing midstory.

Over a longer period (>50 years), decline in the overstory would continue, and the sapling patches would develop into pole-sized trees. Striped maple would be cycling back to sapling stage while beech would begin to show the more sever effects of scale complex. Open fern and grass patches would be reduced through encroachment from striped maple, beech, and sweet birch.

There is no past experience to observe this kind of vegetative pattern. It is likely that in 100 or more years, this forest type would evolve into a two-age character. A remnant overstory of sparsely stocked, old growth trees would be mixed with various stocking levels of beech and sweet birch mid stories and or mixtures of fern, grass or striped maple understories. Most trees would be of low or no commercial value.

Where stands were only partially affected and sufficient healthy trees remain, change will vary depending on current and future stress levels in the trees in each stand and the amount of stocking that was lost. Some stands will continue to decline with a similar outcome as explained above, only it will occur over a longer period of time. In most stands, the remaining healthy trees will survive. Growth should exceed mortality and crowns will expand to reoccupy current canopy gaps. Future healthy growing conditions should reduce the effects of this last decline event and, over time, restore near normal forest conditions. Salvaging of dead and dying trees alone is not likely to affect the health of the remaining stand. There would be less seed germination and understory development as a result of not having a soil disturbance related to timber harvest. In most cases, the salvage treatment includes removing some trees that are relatively healthy but growing in close competition with other healthy trees. If these trees are not cut,

competition will remain as a stress in that group of trees. Future stress events such as drought or insect defoliation may combine to result in future mortality and decline in that group.

Section 2: Direct/Indirect Effects From the Combination of All Treatments Proposed on Sites, by Alternative

In this section, the direct/indirect effects of alternatives (i.e., Alternatives 1 through 5) for managing the treatment areas are described for each vegetation condition indicator (i.e., forest type, relative density, age, dead trees, understory/midstory vegetation, canopy closure). These are the indicators mentioned in the affected environment that serve as an important "yardstick" for measuring management results.

The direct/indirect effect of, or the vegetation outcome from, implementing an alternative is a result of the application of all management practices needed to provide the outputs and benefits of that alternative. For example, the practices of even-aged silviculture, road construction, herbicide treatment, and wildlife habitat improvement all have effects on the vegetation resource. Each alternative requires a unique mix of these practices to provide the alternative's response to the management problems or the issues. Therefore, the effect of each alternative on vegetation will be unique. (USDA-FS 1986, p. 4-61)

When assessing the direct/indirect effects of an alternative, resource specialists considered the quantity of each practice, where the practice would be applied, and over what time frame. They then evaluated the magnitude of the effects, and for each alternative, integrated these evaluations of all practices to provide a comprehensive view of how a particular alternative would change the existing condition of each environmental element.

The following criteria discussed in previous sections of this Chapter provide a valuable indication of the comparative effects of or the outcomes from the combined treatments within each alternative. They provide important indications of the condition of the forest vegetation resource on the treatment sites over the short-term (next twenty years), as it relates to the issues or concerns identified for this project. These short-term changes also can be used to help project what may happen over the long-term (next 80 to 100 years).

Projected Composition and Structure of Overstory Vegetation

Forest Type Composition Changes

No tree species would be eliminated from any individual site under any alternative; however, relative abundances of tree species would change. This is indicated by a shift over the short term (next 20 years) in forest type composition within the project area. Table 71 displays the current forest type composition for the stands proposed for treatment within the project area and shows that recent mortality/decline has already caused substantial shifts in forest type composition on the sites proposed for treatment. Upland hardwood and sugar maple types have shown the biggest losses (over 900 acres total, or 21% and 88%, respectively of each forest type) while Allegheny hardwoods, northern hardwoods, and the red maple type have gained close to 1,560 acres (with over 1,000 acres of the gain in the Allegheny hardwood type). Interpreting this is confounded somewhat by the fact that close to 650 acres of the total 1560-acre gain comes from the 650 acres where the previous type is unknown. However, it is quite likely that the major shift that has occurred has been from the upland hardwood and sugar maple types to the Allegheny hardwood type due to sugar maple, red maple, and American beech mortality. In other words, maples and beech are dying and the proportion of black cherry is, therefore, increasing.

Comparing the alternative outcomes in 20 years (2019) for the 8,223 acres treated in this project, in Alternative 1 there is a shift of 300 acres from northern hardwoods (sugar maple and beech primarily) to

Allegheny hardwoods (+76 acres) and upland hardwoods (+240 acres). This is consistent with the emphasis in MA 3.0 on producing high quality Allegheny hardwoods (USDA-FS 1986a, p. 4-82) and serves to help move the project area toward the forest type composition projected for Alternative D in the Forest Plan (USDA-FS 1986, p. 4-94). It is also consistent with the recent findings that black cherry and other species which require less calcium and magnesium are better suited to these sites having poor nutrient capital (plateau and upper backslope sites) than is sugar maple (Horsley et al 1999, pp 60-62).

Table 71. Forest Type Composition – Project Outcome for Each Alternative in 2019 for the Proposed Treatment Areas (8,223 Acres)

Forest Type	Whole Stand before Mortality/ Decline (~1993)	Healthy Stand after Mortality/ Decline (1998)	Change	Outcomes – 2019			
				Alt .1	Alts. 2 & 5	Alt. 3	Alt. 4
unknown*	642	0	N/A	0	0	0	0
Red pine	562	562	0	562	562	562	562
Tamarack	30	30	0	28	30	30	30
White/Norway spruce	57	57	0	57	57	57	57
Northern Hdwd	538	699	+161	408	637	542	637
Allegheny Hdwd	1,627	2,661	+1,034	2,737	2,584	2,613	2,613
Red maple	922	1,285	+363	1,266	1,356	1,356	1,352
Sugar maple	172	20	-152	0	20	0	20
Beech	26	14	-12	11	14	14	14
Black birch	0	0	0	0	29	0	0
Upland Hardwood	3,647	2,895	-752	3,135	2,934	3,049	2,929
Openings	0	0	0	19	0	0	9
Total	***8,223***	***8,223***	***0***	***8,223***	***8,223***	***8,223***	***8,223***

**Adequate data is not available to describe the vegetation condition on these acres before mortality/decline began.*

In Alternative 3 (lower emphasis on even-aged management on declining sites than Alternative 1, but reforestation activities continue with some sub-optimal growing conditions for Allegheny hardwoods), there is a shift of approximately 200 acres from Northern Hardwoods (-157 acres) and Allegheny hardwoods (-48 acres) to red maple (+71 acres) and upland hardwoods (+154 acres). This reflects the lower emphasis in Alternative 3 on providing optimal regeneration conditions for high value species and species better suited to growing on some of these nutrient poor sites.

In Alternative 4 (uneven-aged management emphasis) there is a shift during the next 20 years of 110 acres from Northern hardwoods (-62 acres) and Allegheny hardwoods (-48 acres) to red maple (+67 acres) and upland hardwoods (+34 acres). This reflects the effects of sugar maple and beech mortality, as well as the low emphasis on providing optimal growing conditions for high quality hardwoods (such as black cherry). This alternative most closely approximates the management philosophy embodied in Alternative A evaluated in the Forest Plan EIS (USDA-FS 1986, pp. 2-26 to 2-28). (Alternative A was not selected for implementation for reasons summarized in Appendix F. Alternative 4 in the East Side project does little to emphasize providing a better match between tree species and site nutrient capital.

In Alternative 2 (salvage thinning emphasis) and Alternative 5 (no management activity), there is a shift of 140 acres from Northern hardwoods (-62 acres) and Allegheny hardwoods (-77 acres) to red maple (+71 acres), upland hardwoods (+39 acres), and black birch (+29 acres). This reflects the absence of reforestation activity in both of these alternatives and no "managed" emphasis on matching tree species to

the sites that provide the best nutrient conditions for enhanced tree growth and survival. Over an extended period of time, natural processes would provide a better match between the trees and the sites, though the species and their stocking may not achieve MA 3.0 objectives as well.

Looking at outcomes 20 years from now provides an opportunity to review the results after all projected activity from this project is well beyond completion. It begins to show trends, in this case for forest type composition changes, which will be accentuated over the long term (next 80 to 100 years). If Alternative 1 types of management are continued over the long term, we can expect to see a shift toward Allegheny hardwoods and upland hardwoods, species more suited to sites where decline and mortality is now quite evident. This management most closely matches Forest Plan Alternative D. Alternative 3 provides a lower emphasis on these species, and Alternatives 2, 4, and 5 do very little to emphasize management for high quality hardwoods, a primary objective for MA 3.0. All three of these latter alternatives would lead to a substantial reduction of black cherry on these sites and an increase in American beech, particularly in the form of thickets of sapling/pole-sized trees which, due to beech bark disease impacts, may well interfere with sustaining large-tree forest cover as we know it today. We would actually expect to see a shift toward the Northern hardwood type with a much different structure than what exists today.

The shift noted in this analysis, mainly caused by a reduction in the number of maple trees, is confirmed by Forest Inventory and Analysis (FIA) data (USDA-FS, 1995). The data show that within the four-county area of the ANF, the relative stocking of sugar and red maples is declining. However, the FIA data also indicate that within a five-State area both maple species are increasing in relative stocking; the North American Maple Project supports this finding. Thus, while locally on the Allegheny Plateau the number of maple trees are declining, regionally they are increasing. Looking regionally at the Northern hardwood ecosystem, there is no effect on tree species diversity - the number and the evenness of tree species have not changed.

Stand Age

The effect of the management strategies/activities inherent in each alternative results in a range of age class outcomes for the sites proposed for treatment (Table 72). Implementation of the Forest Plan (Alternative D in the Forest Plan FEIS), including the harvest practices and reforestation practices proposed therein, would result in the age class distribution shown for Alternative D in the Forest Plan EIS (USDA-FS 1986, p 4-94). Forest-wide, about 30,000 acres of new 0-10 age class would develop each decade (from 1986 through 2016) in MA 3.0, or about 9% per decade of the total MA 3.0 acres. Table 51 indicates 5% of the East Side project area is currently in the 0-10 age class. The maximum amount of new 0-10 age class proposed in any East Side alternative occurs in Alternative 1 (2,905 acres or 2.1% of the total project area) followed by Alternative 3 (1.6%). Alternatives 2, 4, and 5 add no additional acres to the 0-10 age class, therefore contributing nothing toward achieving that Forest Plan outcome. In Alternatives 1 and 3, final harvest activity moves conditions toward Forest Plan 0-30 age class objectives, but the results are several percentage points below Forest Plan projected outcomes (USDA-FS 1986, p. 4-94). In Alternative 1, over two-thirds of it is in response to natural catastrophic events (mortality and decline), whereas in Alternative 3 over three-fourths is mortality/decline driven (see Table 59). Even though Alternative 1 and Alternative 3 final harvests are responsive primarily to a natural catastrophic event, the outcome for 0-10 age class remains below Forest Plan objectives for this class.

Age class relationships can be an indicator of other important factors. Management strategies such as rotation age are built around average tree growth performance and longevity. These factors can be used to regulate stand ages and therefore regulate growth and yield. Also stand ages can be regulated to insure the sustained and even flow of forest products or non-tangible amenities and habitats.

Table 72 indicates that none of the alternatives improve the distribution of acres within the 21-50 age class, as expected. Acres of mature (> 50 years) forested condition also provides an important indicator of vegetation diversity among the sites to be treated. All of them provide a large number of acres >50 years old, with Alternatives 2 and 5 and 4 providing the highest amount (99% of the treatment areas). In Alternative 4 with uneven-aged management, over time, a substantial number of the acres >50 years old may, if the treatment is successful, develop a multi-aged condition with the younger age class dominated by beech saplings which most likely would not grow much larger than that size class. There are substantial concerns locally about forest health and maintaining forest cover as large areas of land progress to older ages, particularly when interfering plants dominate the understory and tree seedlings are sparse. These concerns would be lowest in Alternative 1, followed by Alternative 3, where there is a greater emphasis on establishing younger, more vigorous age classes. In Alternatives 2 and 5, decline may well continue to occur on sites where it has been the heaviest, and without reforestation practices there is little opportunity for vigorous young tree seedlings to replace older trees that die.

Table 72. Alternative Treatment Area Age Class Outcomes in Year 2019

		Future (2019) Acres			
Age Classes (years)	**Present (1999) Acres**	**Alt. 1**	**Alt. 2 & 5**	**Alt. 3**	**Alt. 4**
None	0	19	0	9	9
11-20	56	2,881[1]	0	2,220[2]	0
21-50	67	52	56	52	56
51 - 110	7,920	4,370	6,355	4,896	6,346
111+	180	901	1,812	1,046	1,812
Total	8,223	8,223	8,223	8,223	8,223

1 37% Allegheny Hardwoods; 17% Red Maple (dry site); 46% Mixed Upland Hardwoods

2 5% Northern Hardwoods; 33% Allegheny Hardwoods; 20% Red Maple (dry site); 42% Mixed Upland Hardwoods

Relative Density

One of the primary objectives of MA 3.0 is to maintain healthy stands in forested conditions capable of producing high value sawtimber. This means that stands that are intended to produce the sawtimber be maintained in a condition that utilizes the site, and that are capable of sustaining a forested condition over time. One way of measuring how well a site is occupied is to look at a measure of stand stocking. Table 73 shows the stocking outcomes that are expected to develop in the next 20 years. These are a direct result of the combination of timber harvests and reforestation treatments proposed in each of the alternatives.

The current condition of vegetation shows that 25% of acres proposed for treatment are in a condition that falls far below the level of stocking that is considered to be fully occupying the site. Also, 20% of the acres fall below the standards, but are still in a condition where marginal site utilization occurs. There are 30% of acres in the range where site utilization is desirable, with good potential for growth of individual trees and 25% of acres in a condition that exceeds levels for maximum stocking.

The direct effect of treatments in Alternative 1 is to focus stand regeneration and reforestation treatments on acres that are in the lowest level of stocking (stands which have been most seriously impacted by mortality). In addition, stands that are currently in the highest level of stocking will either be thinned or regenerated (given other forest plan implementation considerations). The result is that the majority of

acres will either be in the moderately well stocked or well-stocked condition after treatments. This achieves the long-term management objectives for MA 3.0.

The direct effect of treatments in Alternative 3 is similar to Alternative 1. However, stands that receive the most intensive combination of treatments to achieve the long-term objectives of MA 3.0 are constrained by accessibility to existing roads. Reforestation activities that achieve a lesser degree of reforestation success are proposed in stands where access does not currently exist.

Alternatives 2 and 5 do not result in stand stocking conditions that meet the long-term objectives for MA 3.0. Reforestation activities are not initiated in stands that are currently in a low stocked condition. Alternative 4 promotes regeneration through the application of uneven-aged management and results in some increase in the occupancy of forested sites. However, due to the number of acres where uneven-aged management is not feasible, and the concerns related to how well uneven-aged regeneration will occur, full site occupancy occurs on less acres than in Alternatives 1 and 3.

Many areas proposed for green treatment have experienced low levels of tree mortality/decline. More substantial changes have occurred in the forest canopy vegetative structure of the areas proposed for salvage treatment. Before mortality began to develop, over 75 percent of the proposed treatment acres had relative densities greater than 60% (Table 53). A full 96 percent had relative densities greater than 40%.

The mostly closed dense overstory canopy of fairly mature hardwood stands has been opened; the extent of the openings depends on the number of trees that have died or are dying. In severe mortality areas, the crowns of the remaining trees will not grow sufficiently to close the gaps. Trees will not fully utilize the available site, thus lowering forest productivity and altering their capacity to provide their current mix or the Forest Plan desired mix of uses or products, particularly for MA 3.0. Table 73 provides short-term (through 2019) projected relative density outcomes for Alternatives 1 through 5.

Table 73. Alternative Treatment Area Stocking Outcomes in Year 2019

		% of Total Stand Acres Future - 2019				
Relative Density	**Present (1999) Acres**	**Present**	**Alt. 1**	**Alt. 2 & 5**	**Alt. 3**	**Alt. 4**
0-15%	30	0.4	0.5	0.2	0.3	0.3
16-40%	2025	25	4	12	4	12
41-59%	1620	20	3	17	5	17
60-79%	2491	30	56	23	45	37
>79%	2057	25	37	48	46	34
Total	***8223***	***100***	***100***	***100***	***100***	***100***

In areas where mortality is heaviest, and where little reforestation management occurs (such as in Alternatives 2 and 5) or where uneven-aged management (and little even-aged management) is emphasized (such as Alternative 4), short-term (next 20 years) and long-term productivity (next 80 to 100 years) will drop the most. In Alternatives 2, 4, and 5, twenty-nine percent of the project area will have less than 60% relative density compared to only 7 percent in Alternative 1 and 9% in Alternative 3. Looking at the 16% to 40% portion of this grouping, Alternatives 2, 4, and 5 will have 12% of the project acres therein, whereas Alternatives 1 and 3 have only 4 percent there. Over the long term, we would expect to see the number of poorly stocked acres increase in areas where even-aged reforestation and harvesting practices are de-emphasized (Alternatives 2, 4, and 5).

During the last ten years, reforestation success has been limited in areas where reforestation practices are not applied or where uneven-aged management has been implemented (USDA-FS 1998a, p.18). Adaptive management and local administrative studies conducted through the Northeastern Research Station may help identify ways to increase reforestation success with uneven-aged management. Uneven-aged management prescriptions included on 445 acres in MA 2.0 in Alternatives 1 and 4, as well as the 376 acres in Alternative 3, are intended to help expand local knowledge of the requirements for successfully implementing uneven-aged management. Uneven-aged management is the featured silvicultural system for MA 2.0 (USDA-FS 1986a, p. 4-70), hence this MA provides the best opportunity for the majority of this type of evaluation.

Standing Dead Trees/Snags

The number of standing dead trees and snags is another vegetation structural feature that has increased throughout the project area, but particularly in the proposed treatment areas. Twenty years from now most of the existing standing dead trees will have fallen over. New standing dead trees will develop, particularly from those trees that may become stressed by other environmental factors. It is difficult to predict how many there will be, however as trees age, they become more susceptible to decline and mortality. The number of acres in the 51-110 and the 111+ age classes serves as an indicator of the potential for dead trees to develop in each alternative. Table 72 indicates the largest number of older age class acres (99% of the total project acres) will occur in Alternatives 2, 4, and 5, and that is where the greatest potential exists for the largest number of dead trees to develop. Alternatives 1 and 3 still have abundant opportunity for dead trees to develop to meet wildlife needs, since in 20 years 62% and 72%, respectively, of the treatment acres would still consist of the older age classes. Mitigation measures WL 10 through WL 13, shown in Appendix D, provide for retaining an adequate number of dead trees and snags in harvest areas.

Projected Composition and Structure of Understory/Midstory Vegetation

Many of the proposed treatment areas where tree mortality or decline is severe contain dense ground vegetation dominated by New York and hayscented ferns and various grasses (Table 74). Certain severe mortality areas also contain an intermediate layer of small saplings (usually composed of beech or striped maple (Table 74).

Areas with moderate mortality also have a partial overstory canopy cover. The canopy is not dense but provides more shade than in severe mortality areas. Because of the number of past stresses, it will take a longer time for the remaining trees to fill in the gaps. It may be that the remaining trees will never fully recover, but grow at a reduced rate. There are fewer snags per acre when compared to the severe mortality areas since fewer trees have died. The understory is mostly ferns and grasses, and a midstory can be found in some areas.

Lightly-affected mortality areas have basically undergone a natural thinning process. The majority of areas still have greater than 70 percent overstory cover, which is a dense canopy, and still provide habitat for those species that require dense overstory vegetation. There is a slight increase in the number of snags per acre when compared to non-stressed areas. Understory conditions range from being open to stocked with ferns and grasses.

The following two subsections describe the current understory and midstory vegetation conditions on the sites proposed for treatment as well as the projected conditions in 2019 based on the effects of the treatments proposed in each alternative. Understory or ground vegetation can strongly influence the type and amount of midstory vegetation that develops. Dense ground vegetation (particularly ferns and grasses) often prevents midstory development. By the same token, midstory species can limit the amount

of ground vegetation that develops. Shading, or the amount of sunlight reaching the vegetation species of concern, seems to be the primary limiting mechanism.

Understory Vegetation & Interfering Plants

Since tree mortality/decline and defoliation began to occur in the early 1990s, changes have occurred in the understory. Generally, ground cover plants (particularly ferns and grasses) present on the site have grown and become more dense because of increased sunlight. Over time, this adversely affects those plants that do not grow to larger sizes or dominate sites. For example, ferns will grow to two and sometimes three feet in height, forming a dense layer and shading out dog-tooth violets, wood sorrel and trout lily in the ground layer. They also affect woody plants that are capable of growing to larger sizes, since in the seedling stage many tall growing species are very vulnerable to decline and mortality under poor lighting conditions.

Table 74 displays the present condition as well as the expected outcomes by alternative (direct/indirect effects of treatments) through 2019 for the two major categories of plants that would interfere with the development of desired woody and herbaceous plants. Local research has shown that when more than 30% of the survey plots taken in a stand have substantial amounts of plants capable of limiting the development of other desired species, there is a need to remove many of those plants so other species have a chance to develop (Horsley in Marquis 1994b, pp. 216, 218, 231-238). In the first part of the table, note that fern and grass interference is high enough now to limit other plant development on 85% of the sites proposed for treatment. Alternatives 1, 3, and 4 include substantial treatment of interfering plants, and a substantial amount of those interfering plants would occupy the sites in 20 years. Occupancy by beech brush and striped maple is higher in Alternatives 2 and 5, as well as in Alternative 4 where it would consist mostly of beech saplings.

Even though understory conditions appear to be somewhat similar in 20 years for all alternatives, there is a distinct difference between them. The second part of Table 74 begins to look at some of those differences. In 2019, there are substantial differences between alternatives in the density of the interfering plants growing on the sites. This part of the table shows how many stand acres have more than 80% of the plots stocked with substantial amounts of interfering plants. In 2019, fern/grass coverage in Alternatives 1, 3, and 4 (39%, 41%, 38%) would be similar to but slightly lower than the present condition (46%). Alternatives 2 and 5 would be substantially higher (68%). In all of the alternatives, beech and striped maple would be slightly higher than the present condition (4%). Alternatives 2, 4, and 5 have the highest beech and striped maple coverage at 9% to 10%. In Alternative 4, however, it would consist mostly of beech thickets.

In conclusion, the data shows that interfering plants are not eliminated from the treatment sites in any alternative. Treatments temporarily reduce their numbers so other species have a chance to develop. The midstory discussion that follows provides additional details. Over the long-term (80 to 100 years), interfering plant coverage would be the highest in Alternatives 2 and 5, most likely even higher than the present condition. In Alternatives 1 and 3 where a much higher percentage of the stands most affected by mortality/decline become moderately- to well-stocked, interfering plant coverage would decline as overstory shade becomes more pronounced.

Table 74. Alternative Treatment Outcomes[1] - Present and Future (in 2019) Stand Stocking with Plants Which interfere with Tree Seedling Development

		% of Total Stand Acres Having ≥30% of Plots Stocked[2] Future – 2019				
Interfering Plant Category	**Present (1999) Acres**	**Present**	**Alt. 1**	**Alt. 2 & 5**	**Alt. 3**	**Alt. 4**
Fern/grass	7,001	85	98	92	93	93
Beech/Striped Maple	2,544	31	33	47	31	45
Total with any Interference	***7,377***	90	98	93	93	94

		% of Total Stand Acres Having ≥80% of Plots Stocked Future – 2019				
Interfering Plant Category	**Present (1999) Acres**	**Present**	**Alt. 1**	**Alt. 2 & 5**	**Alt. 3**	**Alt. 4**
Fern/grass	3,743	46	39	68	41	38
Beech/Striped Maple	289	4	6	10	6	9
Total with any Interference	***4,960***	60	n/a[3]	n/a[3]	n/a[3]	n/a[3]

1 Outcomes of implementing each alternative on the 8,223 acres evaluated for treatment/no treatment in each alternative.

2 Values in these columns represent the percent of total stand acres where ≥ 30% of the plots taken in the stand had substantial (covered ≥ 30% of the plot) stocking with plants which interfere with tree seedling development.

3 n/a means data is not available.

Midstory Vegetation

The overstory canopy density and the interfering plant density directly affect the development of a mid-story. Table 75 displays the midstory composition at the present and as projected 20 years from now for all stands proposed for treatment, representing the direct/indirect effects of the treatments prescribed in each alternative.

In some cases, the midstory actually consist of beech and striped maple interference. The latter is true for the present condition (Table 75) and also is applicable for the outcome in 2019 for Alternatives 2, 4, and 5. The greatest abundance of adequate tree seedlings occurs only in Alternatives 1 and 3. These are the sites where even-aged reforestation treatments are prescribed. Alternatives 2, 4, and 5 are projected to have equally poor seedling stocking over the short term.

The poor seedling stocking in Alternatives 2 and 5 is due to the abundance of interfering plants and the absence of reforestation treatments. While substantial reforestation treatments occur in Alternative 4, the poor seedling stocking projected for 2019 results from two factors: 1) few tree seedlings other than beech are expected to develop, consistent with results observed locally since Forest Plan implementation began (USDA-FS 1998a, p. 18), and 2). both beech and striped maple would provide an acceptable midstory canopy for those wildlife species requiring a midstory structure, which accounts for the high midstory values in Alternatives 2, 4, and 5. In Alternatives 1 and 3, a substantial portion of the midstory consists of adequate tree seedlings.

Table 75. Alternative Treatment Area Outcomes - Summary of Woody Vegetation

		% of Total Stand Treatment Acres (8,223 acres) Future - 2019				
Woody Vegetation Category	**Present (1999) Acres**	**Present**	**Alt. 1**	**Alt. 2 & 5**	**Alt. 3**	**Alt. 4**
Adequate Tree Seedlings[1]	680	8	43	8	36	11
Midstory Canopy [2]	2,685	33	95	96	96	97
Birch Seedlings [2]	832	10	13	27	13	20

1 *Percents in this row represent the percent of total stand acres where ≥70% of the plots in the stand are adequately stocked with tree seedlings.*

2 *Percents in this row represent the percent of total stand acres where ≥30% of the plots taken in the stand had substantial (covered ≥30% of the plot) stocking with the indicated type of vegetation.*

Projected Composition and Structure of Late Successional Forest/Old Growth

There are almost 4,200 acres older than 111 years within the East Side project area (Table 51). Of that, only 180 acres (4%) are proposed for treatment, as indicated in Table 76. Close to 84% (152 acres) of these acres have suffered from severe mortality and decline. The understory condition of these older stands are dominated by a heavy understory of interfering plants (96%, or 172 acres), and only 4% (8 acres) have tree seedlings present in quantities adequate to ensure long-term maintenance of forest cover on the site.

Salvage reforestation treatments are prescribed on 152 acres to ensure that vigorous and well-stocked young forest stands develop successfully on these poorly stocked sites. Treatments are designed to maintain continuous forest cover on these sites over the long term. Even-age regeneration treatments are proposed in one stand and salvage thinning is proposed in one stand.

Table 76. Summary of Harvest and Reforestation Activity Proposed for Stands ≥ 111 Years Old

Harvest Activity	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 5**
Salvage Clearcut	8		8		
Salvage Shelterwood Seed-Shelterwood Removal	27		27		
Salvage Two-age	62		62		
Salvage Delay Shelterwood Removal	55		55		
Green Thinning	22		22		
Salvage Thinning	6	89	6	27	
Individual Tree Selection				117	
Total	***180***	***89***	***180***	***144***	***0***
Reforestation Activity	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 5**
Herbicide	152		152	35	
Site Preparation/Striped Maple Cutting	144		144	82	
Planting	19		19		
Fencing	117		117		
Fertilization	8		8		
Site Preparation for Natural Regeneration	8			8	
Total	***448***	***0***	***448***	***125***	***0***

Close to 69% of the entire project area is in the 71 to 110-year-old age class and could potentially develop into old growth during the next ten to 50 years (Table 51). In fact, 30,723 acres or 22% of the project area in the 91-110 year-old age class, are not proposed for treatment now and provide the potential for additional late successional forest during the next ten to 20 years.

The action alternatives include a small research and demonstration area on the Kane Experimental Forest. It consists of three-acre applications of shelterwood, delayed shelterwood and clearcut. The site will be treated with herbicide to control understory vegetation and protected with a deer fence. The effects of these treatments relative to vegetation composition, structure and function will be the same as those discussed in the action alternatives.

Cumulative Effects

The cumulative effects discussion for the East Side project assesses the combined effects from past, present, and "future foreseeable" actions from activity on Federal and non-Federal land within the East Side project.

"Future foreseeable actions" in this instance are those actions which might reasonably be expected to occur on private land or those which reasonably might be expected to occur in the future from past, present, or future ANF decisions.

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 (USDA-FS 1986, pp. 4-61 to 4-122). The East Side project cumulative effects analysis relies heavily on the results of this referenced Forest Plan EIS analysis.

The cumulative effects of environmental consequences is discussed in terms of the cumulative effects from harvest treatments, cumulative treatment amounts, age class and forest type distribution, relative density, understory and midstory vegetation, dead and live trees.

Cumulative Effects from Harvest Treatments

Cumulative effects on vegetation for the entire project area will be evaluated by considering both ANF land and private land. ANF considerations will include the 8,223 acres of treatments proposed in the East Side project as well as other past, present and reasonably foreseeable future actions within the 139,990-acre East Side project area. Activities projected to occur on private land (28,195 acres) will also be considered. Lands within the entire 168,185-acre East Side project area can be categorized by ownership, and whether land is forested or non-forested (Table 77).

Table 77. Ownership and Forest/Non-forest land classification for the East Side Project Area (168,185 acres)

Type of Ownership	% of Project Area
ANF – Forested	81
ANF - Non-forest	2
Private – Municipal	1
Private - Open/Non-forest and Seedling/sapling stands	5
Private – Forested	11

The cumulative effect of vegetative management activities will be evaluated by totaling past ANF treatments, East Side treatments, and other known future ANF treatments and future private treatments for the next twenty years (data for past private treatments is not available). Estimates of private harvest activity are based upon research (landowner surveys) conducted in Pennsylvania in the 1990's that indicates that up to 52% of non-industrial forest landowners intend to practice some sort of management on their land within the next decade. That management could include harvesting up to 40% of their lands using some kind of intermediate stand treatment and up to 12% with some kind of even-aged regeneration harvest (Nowak, personal communication). Industrial landowners, on the average, would harvest at about the same level as the ANF plans. In this East Side analysis, we will make private land management projections for the next twenty years using this information.

Cumulative Treatment Amounts

Table 78 displays the summary of treatments that have occurred or are anticipated to occur within the East Side project area. Forest accomplishment records have been reviewed to determine the level of activity that has occurred within the East Side project since 1986 (since approval of the Forest Plan). These figures are displayed in column 2. It should be noted that multiple treatments may have occurred on any given acre. For example, in the past 14 years, a 40-acre stand could have received a shelterwood seed cut, followed by an application of herbicide, the final harvest (once adequate seedlings were established), and site preparation for natural regeneration. In the table below, the forty acres being treated would be included in the even-age final harvest, shelterwood seed, site prep for natural regeneration and herbicide figures. Therefore, the information presented here represents the total acres of treatment, not the total number of acres that may have received one or more treatments.

Column three represents treatments that are anticipated to occur based upon current levels of management authorized by the Forest Plan and Biological Opinion. A twenty-year time period is used.

Estimates of activities that occur on private land (column three) are based on the survey of non-industrial private landowners mentioned above. We have made no projections of reforestation activities these private landowners may conduct in conjunction with their even-aged final harvest activity. These activities are necessary to assure adequate seedling stocking and development on private land just as they are on Federal land, but a significant number of people are reluctant to make the investment required. At this point there is no reasonable way to estimate how much reforestation activity will occur.

Columns 4, 6, 8, 10 and 12 display the total amount of treatment proposed in the East Side project for each alternative. Columns 5, 7, 9, 11 and 13 display the cumulative totals for each alternative.

Table 78. Vegetation Cumulative Effect Summary

ACTIVITY	Past FS Treatments 1986-1998	Future FS Treat-ment	Past Private Treatment	Future Private Treatment	ACRES OF TREATMENT BY ALTERNATIVES/CUMULATIVE EFFECT (CE)									
					ALT 1	ALT 1 CE	ALT 2	ALT 2 CE	ALT 3	ALT 3 CE	ALT 4	ALT 4 CE	ALT 5	ALT 5 CE
Commercial timber harvest														
Even-aged final harvest	14,095	11,380	687	1,374	981	28,517		27,536	789	28,325	9	27,545		27,536
Shelterwood Seed Cut	5,280	10,298			1,924	18,132		16,208	1,459	17,667		16,208		16,208
Two-age Prep	65				253	318		65	126	191		65		65
Two-age	680				132	812		680	130	810		680		680
Uneven-aged Prep	24				18	42		24	18	42		24		24
Uneven-aged Selection	2,525	4,360			427	7,312		6,885	358	7,243	2,863	9,748		6,885
Intermediate Thinning	17,116	17,600	1,779	3,558	1,776	41,829		40,053	533	40,586		40,053		40,053
Salvage Thinning	5,156	0			2,467	7,623	4,220	9,376	1,909	7,065	2,473	7,629		5,156
No Harvest - Reforestation Only					245	245			469	469	634	634		
Reforestation/Understory Treatments														
Planting	1,092	2,532			815	4,439		3,624	725	4,349	302	3,926		3,624
Fencing	4,167	9,668			2,314	16,149		13,835	1,977	15,812	947	14,782		13,835
Herbicide	7,425	17,224			3,487	28,136		24,649	3,005	27,654	2,752	27,401		24,649
Regeneration	7,644	17,732			3,093	28,469		25,376	2,617	27,993	2,638	28,014		25,376
Fertilization	7,218	16,744			1,322	25,284		23,962	1,103	25,065		23,962		23,962
Release/Timber Stand Improvement	1,223	2,836			576	4,635		4,059	576	4,635	409	4,468		4,059

The cumulative totals for harvest and reforestation activity projections shown on this table are summarized in Table 79. The harvest values are shown as a percent of the total forested area (153,240 acres) within the East Side project area, including both ANF and private land. For comparative purposes, the reforestation treatment is shown as a percent of the total ANF forested land (136,260 acres) within the East Side project area since there is no information available regarding the amount of treatment that would occur on private land. However, it is safe to say reforestation activity would be substantially lower on private non-industrial land.

Table 79. East Side Project Area Cumulative Totals by Treatment

	Evaluation Area Acres	Past Forest Service Treatment 86-98	% of Project Area Treated 1986-1998, East Side Project Proposals, Current ANF and Private Twenty-year Plans				
			Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Final Harvest	153,240	9%	19%	18%	18%	18%	18%
Two-age	153,240	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Selection	153,240	2%	5%	4%	5%	6%	4%
Intermediate Thinning	153,240	11%	27%	26%	26%	26%	26%
Salvage Thinning	153,240	3%	5%	6%	5%	5%	3%
Planting	136,260	<1%	3%	3%	3%	3%	3%
Fencing	136,260	3%	12%	10%	12%	11%	10%
Herbicide	136,260	5%	21%	18%	20%	21%	18%

Notice that the total final harvest activity completed between 1986 and 1998 and planned through the East Side project and future plans ranges between 18% (Alternatives 2 through 5) and 19% (Alternative 1) of the land area between all of the alternatives. Therefore, a large portion (81% to 82%) of the project area is not proposed for final harvest treatment. On a proportional basis, acres harvested pursuant to these plans would be less than was projected in the Forest Plan through 2019 (USDA-FS 2000a, p. A-2). Therefore, cumulative effects would also be lower.

Total herbicide treatment ranges from 18% (Alternatives 2 and 5) to 21% (Alternatives 1 and 3). Less herbicide and total reforestation treatment would occur than projected in the Forest Plan through 2019 (USDA-FS 2000a, p. A-2). Therefore, cumulative effects would also be lower.

Age Class and Forest Type Distribution

Cumulative changes in age class distribution will be considered at the landscape level, and will include an evaluation for only the ANF. Data for private land is limited for this analysis. Changes in age class will be evaluated based upon treatments proposed in the East Side project area included in Table 78.

Age Class Distribution

Table 80 displays the present age class distribution found within the East Side project area on ANF land, and forecasts the distribution that would occur in twenty years (in year 2019) if treatments occur. There are differences in age class distribution anticipated between Alternatives. Changes in Alternatives 1 and 3 are as a result of treatments proposed in the East Side project as well as future (from the 20-year

estimates) ANF treatments. Changes in Alternatives 2 and 5 result only from future ANF treatments proposed in projects other than the East Side project. Changes in Alternative 4 result from a minor amount of East Side project treatment and future ANF treatment proposals.

Table 80. Age Class Distribution for ANF Land within the Project Area - Projected to 2019 (as a percent of the 139,990 acres of ANF land)

Age Class	Present Condition Year 1999	Alt. 1 Year 2019	Alts. 2, 4 & 5 Year 2019	Alt 3 Year 2019
Openings (no age)	3%	3%	3%	3%
0-10 years	5%	4%	4%	4%
11-20 years	6%	8%	6%	7%
21-50 years	6%	16%	16%	16%
51-110 years	76%	44%	46%	45%
111+ years	3%	24%	25%	24%
Unknown	1%	1%	1%	1%

In all alternatives, at least 24% of the project area will be older than 111 years by 2019 (a substantial increase from the 3% existing today), between 44% and 46% will be from 51 to 110 years old, 16% will be in the 21 to 50 year age group. In all alternatives, 4% will be 0 to 10 years. Mature (> 50 years old) forest habitat, therefore, would exceed 68% in all alternatives. In Alternatives 1, 8% of the project area would be in the 11-20 year age class, whereas Alternatives 2, 4 and 5 would provide 6%, and Alternative 3 would provide 7%. Regardless of the alternative, there is similar distribution in age class.

Change in age class distribution on private land is limited to the 1,374 acres of final harvest anticipated to occur (Table 81). This would add only 5% to the 0-20 year age class in the project area.

Table 81. Projected Non-forest and 0-20 Year Age Class for Private Land Within the East Side Project Area Based on Twenty Year Projections

Private Land Category	Present Condition		Future Condition (year 2019)	
Private - Open Non-forest and Seedling/sapling stands	9,028	(32%)	10,402	(37%)
Private - Forested	16,982	(60%)	15,609	(55%)
Structures/Water	2,185	(8%)	2,185	(8%)
Total	**28,195**		**28,195**	

Forest Type

Little information is available to enable us to provide values for projected forest type changes for the whole project area or for private land. However, the forest type change discussion in the direct/indirect effects section for the proposed treatment sites (Table 71) provides information about the short-term and long-term trends if the management philosophy included in the Forest Plan were to continue over an extended period of time. Those trends in forest type would also apply to other future projects that could be proposed later in other stands within the East Side project area. Refer to the referenced section for additional pertinent details.

Keep in mind that as trees mature, stand health and vigor decline (Smith, 1986). Tree resiliency to stress also decreases. Older trees become weakened and sometimes more susceptible to disease, insects, and other natural stresses such as drought. Defoliation sometimes has been noted in older stands when it is much less in nearby younger stands. Repeated defoliation, coupled with other stresses such as drought or inherent site nutrient deficiencies, can lead to tree decline/mortality particularly for more sensitive species such as sugar maple and white ash. Over an extended period of time, this could lead to substantial forest type changes throughout the project area depending upon the timing and severity of these natural stresses. There are no estimates for future salvage thinnings at this time (Table 78) as we do not have a means of predicting either their occurrence or their severity.

Relative Density

As was the case with forest types, little information is available to enable us to provide values for projected relative density changes for the whole project area or for private land. However, the relative density discussion in the direct/indirect effects section for the proposed treatment sites provides information about the short-term and long-term trends if the management philosophy inherent in the Forest Plan were to continue over an extended period of time or were to be proposed in other future projects within the East Side project area. Refer to the referenced section for additional pertinent details.

Understory Vegetation/Midstory Vegetation Tree Seedlings

The existing understory/midstory conditions for the ANF portion of the project area have been displayed in Table 54. Those estimates were made before the recent tree mortality developed, so we expect interfering plants are more abundant than the 70% coverage estimated there. The area occupied by adequate tree seedlings no doubt has decreased below the 23% estimate. Conditions on private land would be similar. The direct/indirect effects of the treatments proposed in each of the alternatives on the midstory/understory conditions in the treatment areas was displayed in Table 74 and Table 75.

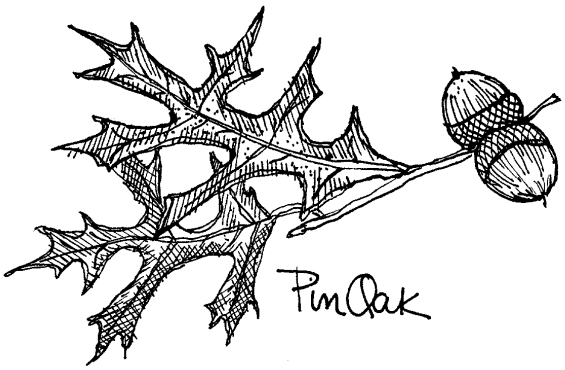
Table 74 shows projected outcomes for interfering plants in 2019 for the 8223 acres where treatments are proposed. Alternative 5 (no treatment) trends provide an indication of the trend toward increasing dominance (increased interfering plant density) of sites by interfering plants, particularly where mortality has occurred and deer browsing pressure is high. This trend no doubt would occur on the remainder of the project area, including the private land. In conclusion, interfering plants are very aggressive, and we expect them to become more dominant on sites within the project area through 2019. As a consequence, we anticipate the abundance of other herbaceous plants and tree seedlings to decrease.

Dead and Live Trees

For the ANF portion of the project area, current dead and live tree species composition, sizes, and abundance were described in the affected environment section. With normal growth, we expect the abundance of ≥20" diameter trees to substantially increase through 2019 with a corresponding decrease in the number of trees in the smaller diameter categories. Average tree diameters should increase from 2" to 4" during the next 20 years. All projects will meet the terms and conditions of the Biological Opinion.

Summary Of Mitigation Measures And Effectiveness

Several wildlife and herbicide mitigation measures were identified throughout the vegetation environmental consequences section. The site-specific identification of stands these apply to are found in Appendix D. The effectiveness of these measures is discussed in the landtype, water and watershed, wildlife, and human health and safety resource sections.



Wildlife

Affected Environment

Method of Analysis

This analysis of the wildlife resource is done using a combination of three basic strategies. These include 1.) The coarse filter approach, which is used to identify plant and associated wildlife communities at the landscape scale. This approach assumes that if the species, genetics, functions and processes are monitored and protected at the landscape/community level, then the bulk of the biotic species, both known and unknown, will also be protected; 2.) The management indicator species approach, which is used to monitor habitat changes and to assess changes in available habitats that would occur under each of the alternatives; and 3.) a fine filter strategy, which is used to assess habitat and effects on threatened, endangered and sensitive species. This strategy also assesses effects on rare or sensitive communities such as riparian areas, wetlands, unique or specialized habitats as well as unique features within all communities such as coarse woody debris, rock outcroppings, aspen and conifer inclusions. A fine filter approach is used on these resources, since effects may not be apparent using the coarse filter and MIS approach. The wildlife report and Biological Assessment (BA) in Appendix C provide further discussion related to the steps used in the wildlife analysis, as well as a detailed evaluation on the habitat and potential effects on TES species.

Composition and Structure of Communities

The diversity of wildlife is dependent upon the diversity of available habitat. There are approximately 312 wildlife species (49 mammals, 213 birds, 24 reptiles, and 26 amphibians) found on the ANF. Food and cover for wildlife are reflected to a large degree by the successional stages of various forest types and other cover types. Different plant communities each support more or less distinct wildlife communities. Table 82 displays some of the forest and non-forest community types found within the project area and the number of species associated with each type (adapted from DeGraaf, et al., 1992). Forested stands are classified by age which also reflects size classes or structure that are often associated with distinct wildlife communities such as seedling, sapling, pole and sawtimber.

Wildlife use and abundance can be greatly affected by stand structure. Structural diversity that affects wildlife can be evaluated by looking at forested size classes and understory and overstory conditions.

The vertical structure within forested stands has been greatly affected by past and present levels of deer browsing. Deer have eliminated or greatly reduced many shrub and herbaceous plant species and have altered understory and midstory conditions from what would have occurred. The lack of midstory and understory can affect wildlife use on the ANF. Sixty wildlife species are known to use ericaceous shrubs, and 40 species prefer a dominant deciduous shrub component. In addition to deciduous and ericaceous shrubs, beech and striped maple are the primary vegetation that dominate the midstory vegetation in the watersheds. Early successional habitat can also provide structure to patches of shrubs.

Table 82. East Side Wildlife Habitats[1]

COMMUNITY TYPE	Acres	ANIMALS				
		Amphibians	Reptiles	Birds	Mammals	Total
Hardwood Forest Types						
• Seedling (0-10 yrs)	7,275	10	9	95	42	156
• Sapling (11-20 yrs)	8,656	17	11	64	37	129
• Pole (21-50 yrs)	8,619	17	11	64	37	129
• Mature (51-110 yrs)	106,317	18	12	89	44	163
Oak - Sawtimber (51+ yrs)	114	13	15	77	38	143
Aspen						
• Seedling (0-10 yrs)	64	4	8	80	40	132
• Mature (51+ yrs)	260	6	10	60	42	118
Old Growth (111+ yrs)	4,189	5	9	26	14	54
Mature Hemlock[2]	1,758	12	7	74	37	130
Mature White Pine	12	10	10	76	36	132
Non-Forest						
• Grass/Forb	3160	2	14	69	25	110
• Tall Forb/Shrub	568	1	13	89	29	111
Riparian[3]	12,835	25	5	33	13	76

1 Habitats are displayed for National Forest System lands within the project area. Adapted from DeGraff 1992

2 Acres of conifer are not classified as stands unless they occupy 50% or more of the stand. Areas with mixed conifer/hardwood are those with less 50% conifer.

3 Acres include floodplain and upper bottoms

Portions of watersheds and sub-watersheds were used for this analysis to display the affected environment and direct/indirect affects. The boundaries for sub-watersheds may encompass sections of one or more large watersheds and were delineated using all units prescribed for activities and land features, such as large streams and rivers. Many of the same features used to define ecological land types (ELTs) were used to delineate sub-watersheds. ELTs are defined as a category of land having a unique combination of potential natural community, soil, landscape features, and climate; and differing from other ecological types in its ability to produce vegetation and respond to management. This scale is necessary to display the effects on the communities, to display the distribution of these communities and to evaluate the effects of treatments on the vegetation and wildlife species that use these communities. Table 83 summarizes the communities by age class that can also be used to reflect the size class of the vegetation.

Table 83. Wildlife Habitat Community Types In The East Side Project Area (In Acres)

	Community Type[8]									
	Forested							Other		
	0-10 years	11-20 years	51-111 years	111+ years	Mature Conifer	Aspen		Riparian (includes private)		Non-forest (open)
Area[9]						0-10	51+	Stream	Upland	
Bear Creek watershed	1155 (7%)	635 (4%)	12,697 (79%)	69 (<1%)	344 (2%)	0	0	2,072 (10%)	1,041 (5%)	414 (3%)
Bucklick Sub-watershed	207 (5%)	309 (7%)	3,272 (76%)	127 (3%)	66 (1%)	5 (<1%)	0	240 (5%)	4 (<1%)	23 (1%)
Kinzua Creek Watershed (middle)	578 (6%)	371 (4%)	6,979 (78%)	0	43 (<1%)	0	15 (<1%)	405 (4%)	164 (2%)	303 (3%)
Kinzua Creek Watershed (upper)	216 (4%)	150 (3%)	4,198 (79%)	32 (<1%)	23 (<1%)	0	12 (<1%)	264 (5%)	8 (<1%)	342 (6%)
Salmon Creek Sub-watershed	508 (5%)	267 (3%)	8,041 (82%)	0	75 (1%)	0	5 (<1%)	830 (8%)	0	595 (6%)
Spring Creek Watershed	591 (4%)	764 (6%)	10,680 (81%)	0	1,241 (9%)	0	0	1,578 (11%)	434 (3%)	443 (3%)
S. Branch of Tionesta Creek Watershed	684 (4%)	2,003 (11%)	13,397 (76%)	433 (2%)	563 (3%)	0	18 (<1%)	1,850 (11%)	209 (1%)	252 (1%)
The Branch Sub-watershed	484 (6%)	536 (7%)	5,658 (75%)	73 (1%)	533 (7%)	0	0	658 (8%)	105 (1%)	640 (9%)
Thomas Run Sub-watershed	0	375 (12%)	2,476 (79%)	0	180 (5%)	0	49 (1%)	406 (9%)	494 (11%)	83 (3%)
Tionesta Creek Watershed	86 (3%)	82 (3%)	854 (30%)	1,545 (56%)	103 (4%)	0	12 (<1%)	222 (8%)	8 (<1%)	63 (2%)
W. Branch Tionesta Creek Watershed	92 (<1%)	268 (4%)	5,628 (85%)	20 (<1%)	607 (9%)	0	8 (<1%)	873 (8%)	491 (4%)	172 (3%)
Total Acres	4,600 (5%)	5,762 (6%)	73,880 (78%)	2,300 (2%)	3,778 (4%)	5 (<1%)	119 (<1%)	9,398 (8%)	2,958 (3%)	3,330 (4%)

[8] *Acres do not include the total acres of the East Side project area.*

[9] *Bucklick Sub-Watershed is located within the Sugar Run large Watershed; Salmon Creek and The Branch Sub-Watersheds are located within the Tionesta Creek large Watershed; Thomas Run Sub-Watershed is located within the South Branch of Tionesta Creek large Watershed; Bear Creek includes the Bear Creek, Big Mill Creek and portions of the West Branch of the Clarion River Watersheds.*

Early Successional Forest

Early successional forest habitat (seedling and sapling), 0-20 year vegetation, occurs on approximately 15,931 acres (11%) of the project area. The current conditions for the sub-watersheds in the project area are listed in Table 83.

Table 82 identifies the total number of species that utilize each of these community types. There are 156 different species that utilize 0-10 year old vegetation and 129 that utilize 11-20 year old vegetation. A total of 180 different species utilize the early successional habitat alone or in combination with other habitat types. Of this total, approximately 30 species exclusively depend upon the early successional vegetation.

Early successional vegetation is a dominant habitat type of the South Branch of Tionesta Creek Watershed at approximately 2,687 acres (15%) of this area.

Mature and Late Successional Forest

Approximately 110,506 acres (79%) of the project area occurs as mature (51-110 years) and late successional forest (111+ years). This occurs as a combination of Allegheny, Northern and Upland hardwood forests, with minimal amounts of oak, conifer and mixed hardwood/conifer forests. There are 10 wildlife species that utilize this community type exclusively and over 160 species that utilize a mature forest community in combination with other forested communities (adapted from DeGraaf et al., 1992).

Differences in vegetation types within the mature/late successional forests, result in different utilization by wildlife species. Wildlife species that utilize a mature forest community also differ somewhat by vegetation type. Several of the mature oak forests in the South Branch Tionesta Creek, Spring Creek, Kinzua Creek (upper), Tionesta Creek Watersheds and Salmon Creek Sub-watershed are characterized by mountain laurel and blueberry and generally provide a more diverse understory. As a result, species such as the black-throated green warbler, red-backed vole, wood thrush and black bear are more likely to utilize the oak community, due to midstory vegetation present and the mast provided by acorns. Other species such as the solitary vireo, red squirrel and red-breasted nuthatch prefer a mature hemlock or white pine community. A mature mixed hardwood/conifer forest is preferred by many wildlife species, since the inclusions of hemlock and white pine can provide feeding, nesting and winter shelter opportunities that pure hardwood stands cannot provide. Northern saw-whet owl, hermit thrush, magnolia warbler, scarlet tanager and smoky shrew are just a few of the species that prefer a mature mixed conifer/hardwood community.

Included in the 110,506 acres are 10,537 (10%) acres of management area 6.1; 5,774 (3%) acres of 8.0; and 5,778 (3%) acres of 6.2. Management objectives for these management areas will result in the long-term availability of mature and late successional forests. Due to the predominance of mature forest conditions, much of the project area provides suitable habitat for species that utilize mature and late successional forests.

Within the areas displayed in Table 83, the West Branch Tionesta Creek Watershed provides 85% mature and late successional vegetation communities as a dominant habitat type.

Old Growth

There are presently 4,189 acres of 111+ year old forest within the project area and an additional 32,302 acres (22%) of the project area in the 91-110 year-old age class. The large amount of 91-110 year age class is largely due to the fact that a majority of the ANF is second growth forest. There is no widely or universally applicable definition of old growth forests other than the broad conceptual description that old growth forests are "relatively old and relatively undisturbed by humans" (Hunter 1990). The Forest Plan

provides general guidelines related to the amount and distribution of old growth for each management area. For MA 6.1 lands in the sub-watersheds, habitat is to be provided on a minimum of 10% of the area, and should be distributed so that at least 100 of every 1000 acres contain future old growth (Forest Plan, p. 4-113). Within MA 3.0, old growth habitat should be provided on a minimum of 5% of the area (Forest Plan, p.4-84).

It is believed that late successional or old growth forests provide compositional and structural values not found in younger communities. While some of these characteristics, such as small gaps in the canopy, can be enhanced or created, most old growth values, such as larger diameter trees, can only be achieved over time. While much research has been done on old growth across the U.S., study results can only be used to create general definitions. Each locality, because of unique ecology and history of natural and human disturbance, must have a local definition of old growth (Hunter, 1990). The Forest Plan defines forests to be old growth when they reach 111 years of age (Forest Plan FEIS p. 4-73). We now recognize that old growth characteristics may just begin to be developing at this age, and there are no guidelines for measuring the other features that are often associated with old growth. Because many of the species of hardwoods that exist on the ANF reach maturity at 100-150 years and begin to decline, some features characteristic of old growth stands are never obtained.

Many of the wildlife species found in mature and late successional forests, such as pileated woodpeckers, are found in old growth forests. As with the mature forest stands, tree species diversity provides habitat to support a diversity of bird and other wildlife species. For example, typically northern birds such as red crossbill, pine siskin, golden-crowned kinglet, and purple finch use old growth conifer stands. To date, wildlife research in the Tionesta Scenic and Research Natural Area has not identified any plant or animal species solely dependent on old growth on the ANF (deCalesta pers. communication).

Coarse Woody Debris

Standing dead trees (snags) and dead and downed woody material are structural components that have been used to define old growth systems. Coarse woody debris data has been collected on the ANF since 1994. The test areas were established within clearcuts, sapling stands, savannas, second growth forests, older second growth (130+ years) and old growth. The old growth and older second growth systems have higher quantities of down woody material in the >12" diameter size class and the early successional stands had high amounts of course woody debris in the 6-12" size class (unpublished deCalesta). A comparison of number of species and abundances of small mammals and amphibians trapped from old growth sites and second growth sites, where coarse woody debris is very different, reveals negligent differences (David deCalesta, pers. comm.). The importance of course woody debris for nutrient re-cycling is discussed under Landtypes, Chapter 3. In addition, many of the stands in the project area have levels of dead trees less than those found naturally, due to past cultural treatments such as thinning or timber stand improvement work.

Seventy-two wildlife species on the ANF are known to utilize dead trees and except for the absence of large diameter snags and logs, which is characteristic of 60-80 year old second-growth forest, there is an adequate distribution of standing snags of various size classes throughout the project area. Surveys completed in 1998 and 1999 in and around the East Side project area show 10.3 snags per acre greater than 9 inches, 4.4 snags per acre greater than 12 inches, and 0.5 snags per acre greater than 20 inches (see Appendix C, Table 3).

Conifer

Presently there are 5,090 acres (3%) of mature hemlock, white pine, spruce, larch and red pine in the project area. For many wildlife species, a conifer component is a critical feature of their habitat needs. White-tailed deer, eastern cottontail and winter bird species utilize conifer for winter thermal cover while the ruby-throated hummingbird uses the eastern hemlock for nesting, and the red squirrel uses spruce and hemlock cones as a food source. The ANF defines thick conifer cover as thermal-concentrated, dense hemlock on an area greater or equal to 1/4 acre. Examples of bird species that use coniferous overstories with dense canopy closure for nesting are great blue heron, blackburnian warbler, bald eagle, and common raven. However, most of the preceding birds listed for coniferous overstory/dense canopy closure will also be present in a mixed stand of conifer and hardwood.

The conifer component within the East Side project boundary will be addressed as stands typed as conifer with over 50% stocking. Thick conifer inclusions are usually present along streams, in valleys and seeps; however, these acres are not quantified. This component will be discussed further in the riparian section.

The Spring Creek Watershed has the highest percentage (9%) of mature conifer stands with approximately 1,241 acres.

Non-Forest

There are 3,728 acres (3%) of non-forested habitat in the project area. Upland and wetland non-forest types provide habitats for distinct groups of species, as well as seasonally important elements for species that also use forested habitat (such as brood habitat for ruffed grouse and turkey and spring and fall forage for deer and black bear). Although regenerating hardwoods less than 10 years of age serve as temporary openings, wildlife communities associated with upland non-forested habitat are quite different from those found in regenerating stands. The difference is largely due to the amount of dense, continuous herbaceous cover, which lasts longer in permanent openings than in regenerating stands. The presence of upland non-forest vegetation is necessary for over 50 vertebrate species found on the ANF, of these, nine rely totally on non-forested habitat. Size of openings is also a consideration, and wildlife species that use only non-forested habitat tend to be found using larger grassy openings (5-10 acres), while species that utilize a combination of forest and non-forest types are found using smaller-sized openings.

Other non-forested habitat within the watersheds and sub-watersheds occurs as constructed wildlife openings, gravel pits, powerline ROW's, abandoned and revegetated roads, landings and naturally occurring openings.

The Branch Sub-watershed has approximately 640 acres (9%) of non-forest habitat.

Riparian Habitat

Streamside habitat and the adjacent riparian zone add greatly to the diversity of the forest, attracting a variety of wildlife. Riparian and streamside habitat, as well as ground vegetation associated with wetlands, are particularly important and provide habitat for a variety of wildlife, as well as many rare and/or uncommon species.

This acreage includes all ecological land types of upper bottom habitat and floodplains and for the purpose of this analysis is used to display both the riparian zone and riparian zone of influence. The riparian zone of influence is the transition area between the riparian zone and the adjacent upland. It is

discussed here because many upland species such as barred owl, veery, and several species of bat prefer this zone for reproduction and feeding due to its proximity to water. Riparian areas frequently provide the most diverse plant communities on the landscape, and their importance far exceeds their minor proportion of the land base. Maintaining the integrity of these areas is important because the plant and wildlife communities found here are often sensitive to disturbance. Also, many habitat specialists utilize or require these habitat features and protection of them is necessary to meet the needs of these species. Depression ELT's were also considered although they are defined as:

> *Poorly drained, deep to very deep, depression and swale landforms formed in colluvium and residuum of sandstone, siltstone and shale. These areas are hydric and have a perched water table at 6 inches. Wetlands are common. No intermittent or perennial streams border on or pass through this landtype (Moriarity 1996).*

Some of these areas have been noted to occur as upland sphagnum swamps with a component of hemlock and aspen.

Additional features that exist along and within these corridors provide specialized habitats. Some features include areas with a dense understory conifer component, emergent shrub or grass wetlands, vernal or seasonal ponds, aspen and areas of concentrated spring seeps and boulders. One of the breeding bird transects on the ANF is located within a palustrine emergent shrub wetland with willows and alder being the dominant vegetation. The songbirds noted here were savannah sparrow, swamp sparrow and yellow warbler. Within the groups of sub-watersheds, specialized habitats in the form of conifer inclusions tend to be concentrated within the riparian areas.

The Spring Creek Watershed has 14% streamside and upland riparian areas.

Aspen

The Forest Plan gives direction to regenerate aspen stands to increase their age class (p. 4-92) and to retain the aspen component (p. 4-113). Aspen provides a valuable food source for ruffed grouse (catkins) and beaver (bark). As a standing dead tree, it is utilized by woodpeckers for insects and provides dens for cavity nesting birds such as the eastern bluebird. Stand exams were completed for the project area and 325 acres of aspen were documented to occur. Aspen is generally not found as whole stands but rather as a scattered component and usually within riparian zones or riparian zones of influence. The occurrence of aspen inclusions was documented during field reconnaissance.

Aspen is not abundant in any of the communities displayed in Table 83, however, it does occur on 49 acres (1%) in the Thomas Run Sub-watershed.

Management Indicator Species (MIS)

The management indicator species approach is used to reduce the complexity of discussing all the wildlife species on the forest. Groups of wildlife associated with vegetative communities or key habitat components have been identified and selected as management indicators. The evaluation of the effects of management practices on these species and their habitats provides an additional basis for ensuring the maintenance of biological diversity. Thirteen wildlife and three fish species representing a variety of habitats were selected to monitor trends in habitat capability on the ANF (USDA-FS, 1986a). The information presented in Table 83 displays the wildlife communities found within portions of sub-watersheds and watersheds of the project area.

Using a variety of techniques, the ANF has been monitoring MIS species and their habitat since 1986. Wildlife monitoring data collected, including changes in available habitat, have been summarized in annual ANF Fish and Wildlife Monitoring Reports since 1990. Information from these published reports, as well as on-going or unpublished monitoring data, is incorporated here by reference.

The following includes a discussion of the present condition habitat for MIS within the project area, brief summary of monitoring completed for each species, as well as population and habitat trends when they are known.

Early Successional Species

American Woodcock - This species is an indicator of permanent openings, often in combination with early-successional habitat. The following areas presently provide the desired mix of orchard habitat and openings that provide preferred habitat for this species: Salmon Creek watershed - Salmon and Little Salmon Creek, particularly in the headwaters of these drainages, The Branch Sub-watershed - south of Slater Run along the west branch of Bluejay Creek, Spring Creek watershed – East Branch of Spring Creek, Rappe Run and Gilfoyle Run, Bear Creek Watershed - Slide Run, Spencer Run, Wolf Run, Silver Creek and Bear Creek, South Branch Tionesta Creek Watershed - Crane Run, Tionesta Creek Watershed and Wolf Run, Thomas Run Sub-watershed - headwaters of Thomas Run Sub-watershed and riparian habitat along Rock Run, W. Branch Tionesta Creek Watershed - Five Mile Run and Two Mile Run, Bucklick Watershed - Portions of the Sugar Run and Bucklick Run bottom and the Timberdoodle Flats wildlife interpretive area along the south central border of the watershed, Kinzua Creek Watershed (middle) - the Duck Ponds, Kinzua Creek at Guffy and Westline, most of Windfall Run, upland savannahs in the head of Blacksnake Run, scattered openings in close proximity to regenerating hardwoods along Kinzua Creek and Meade Run, Tionesta Creek Watershed - scattered sites along the Allegheny Reservoir and the Tionesta Creek Watershed bottom.

Using established singing ground census routes, the ANF has been monitoring woodcock use of preferred habitat since 1990. Monitoring data in preferred habitat indicates a fluctuating, but relatively stable woodcock population on the ANF. During the last 10 years, available woodcock habitat within the project area has been relatively unchanged. Development of suitable openings that can be used as singing grounds, in close proximity to nesting cover, has resulted in localized improvement of existing habitat.

In addition to the above, there are also scattered areas of early successional habitat in all the watersheds that provide the desired structure preferred for nesting and roosting but generally lack the opening component required for singing.

Ruffed Grouse - This species is an indicator of early succession or regenerating deciduous habitat, requiring scattered openings and a conifer component. This species occupies a fairly small home range and needs this combination of habitats within a relatively small area. Although grouse will utilize almost any regenerating deciduous habitat, aspen is preferred due to the high stem density provided. Also when available, aspen catkins are readily utilized by grouse as winter forage. Grouse are also found in older forested stands, however, these areas often lack the necessary brood habitat and thermal cover and provide more marginal habitat conditions. The following areas contain an aspen component in combination with openings and conifer; the headwaters of Little Salmon Creek (Salmon Creek watershed), along Martin Run in the South Branch Tionesta Creek Watershed, in scattered regenerating and mature aspen along Rock Run and Thomas Run (Thomas Run Sub-watershed) and in the headwaters of Bucklick Run and Sugar Run (Bucklick watershed).

In addition to the above, an area within the Thomas Run Sub-watershed has been actively managed during the last 10 years to provide the distribution of age classes preferred by grouse. Complexes of different vegetation size and type have been promoted, and conifer has been planted to meet thermal cover needs of grouse and other wildlife that winter over on the ANF. Due to the mature forest character and scarcity or absence of aspen in the Kinzua Creek (upper) and Tionesta Creek Watershed, grouse habitat is limited to scattered stands of regenerating hardwoods that are in close proximity to non-forest habitat. In the Kinzua Creek area, this occurs on the plateau tops in the south central portion of the watershed and in scattered stands adjacent to the Allegheny Reservoir. In the Tionesta Creek Watershed, suitable grouse habitat is restricted to the Tionesta Creek Watershed bottom and scattered regenerating stands along the large pipeline that runs north and south through the area. The best grouse habitat within the Kinzua Creek Watershed (middle) occurs along Kinzua Creek near Guffy. Although this area contains a relatively small aspen component, many of the aspen clones have been regenerated in the last 10-15 years and provide a desirable mix of nesting, brood rearing and drumming habitat. Additionally, there has been conifer and native shrub plantings in this area to enhance cover and forage conditions for wildlife. Suitable grouse habitat also occurs along Meade Run bottom between the Duck Ponds and US Route 219, and on portions of the plateau between Blacksnake Run and Westline that contain regenerating hardwood stands and naturally occurring savannas.

Using established grouse drumming routes and flush counts, the ANF has been monitoring grouse populations and use since 1990. Monitoring data in preferred habitat, including the survey routes, in the forest indicate that grouse populations are cyclic, but stable. During the last 10 years, the distribution and amount of available grouse habitat within the project area has been increasing, due to development of early successional vegetation and implementation of habitat improvement work described previously.

White-tailed Deer - This species is an indicator of early-successional or regenerating deciduous habitat in combination with mature forest. Deer numbers have been fluctuating in portions of the ANF during the last 3-4 years and some seedling white pine is starting to develop on the plateaus. In general, thermal cover occurs primarily along perennial streams and in headwater stands. Browse for deer is available in a small percentage of the project area. Only 5% of the area provides browse in regeneration acres (0-10 year age class). Additional browse is available in the understory of mature hardwood stands but seedling regeneration is not plentiful.

Over-wintering deer densities have been surveyed on the ANF since 1992 and during the last eight years, 39 sites have been monitored. Because most of these sites occur on the plateau, this data alone does not provide an accurate estimate of Forest-wide deer density. While this monitoring data can be used to estimate trends at the site surveyed, deer densities at any one site will vary from year to year depending on severity of the weather, snow conditions, hunting pressure and harvest. As an example, data from the Bear Creek transect indicates that over-wintering deer densities are at a suitable level, but high enough to alter vegetation composition and structure within the project area.

With the exception of Thomas Run Sub-watershed and West Branch of Tionesta Watershed, all of the watersheds or sub-watersheds provide a mix of early successional and mature forest habitat preferred by deer. Thomas Run Sub-watershed and West Branch Tionesta Creek Watershed do not have an abundance of early successional vegetation but do provide large areas of dense thermal cover. The other areas provide a combination of openings, early successional vegetation and thermal cover that could provide suitable habitat for a larger carrying capacity. Due to more recent regeneration cutting, the availability of thermal cover and the presence of non-forested habitat, which provides important spring and fall forage, deer carrying capacity is greatest in the Kinzua Creek (middle), South Branch Tionesta Creek and Spring Creek Watersheds and Bucklick Sub-watershed.

Mature/Late Successional Forest Species

Pileated Woodpecker **-** This species nests in cavities in large trees and was selected as an indicator of old growth in the Forest Plan. Late successional or mature forest occurs on 110,506 acres of the project area. Estimates of the distribution of dead trees within the East Side project show that dead trees are abundant. On average 10 trees >9" in diameter are found per acre. Large, dead trees (>20 inches dbh) are less numerous and average 0.5 trees per acre. (Appendix C, Table 3). While this species is dependent on large diameter trees for nesting, studies in New York and elsewhere indicate that the pileated woodpecker prefers to nest near water (Christy, 1939, Hoyt, 1957) and preferred breeding habitat may be more restricted to stream bottoms and adjacent areas, since these are closer to water and tend to contain a greater number of larger diameter trees. Brauning (1992) reports that as long as extensively forested areas are available, the pileated woodpecker should continue to flourish. Considering that over 79% of the project area consists of mature forest conditions, and considering that preferred breeding habitat in riparian areas has remained relatively unchanged and the number of large snags has increased in recent years, habitat availability within the project area for this species is considered stable or unchanged.

Red-shouldered Hawk **-** This species is an indicator of relatively undisturbed mature forests and is often associated with savannas. Throughout its range in North America and Pennsylvania, the red-shouldered hawk is found in relatively extensive lowland, deciduous, or mixed forests interspersed with small clearings and marshes (Woodrey, 1986). Brauning (1992) suggests that total forest area, particularly moist lowland forest, is a good predictor of the presence of nesting red-shouldered hawks. Additionally, this species may tolerate human population density to some extent as long as large contiguous tracts of woods, including wetland areas, are available (Brauning, 1992). Since mature forest conditions predominate in all of the watersheds and sub-watersheds, potentially suitable nesting habitat for this species is widespread, and active red-shouldered nests are known to occur within the Kinzua Creek Watershed (middle), Bucklick Sub-watershed and Spring Creek Watershed. Foraging habitat for this species is also widespread and occurs along many of the stream bottoms and non-forested habitat in the project area. Preferred foraging habitat occurs in the following areas: north portion of Salmon Creek and headwaters of Little Salmon Creek (Salmon Creek Sub-watershed), south portion of The Branch Sub-watershed along Slater Run, central portion of Spring Creek and E. Branch Spring Creek (Spring Creek Watershed), west portion of Bear Creek (Bear Creek Watershed), S. Branch Tionesta Creek and Crane Run (S. B. Tionesta Creek Watershed), northeast portion of Thomas Run (Thomas Run Sub-watershed), northwest portion of W. Branch Tionesta Creek, Two Mile Run and Five Mile Run (W. Branch Tionesta Creek Watershed), northwest corner of Bucklick Run (Bucklick Sub-watershed), northern section of Tionesta Creek along Pigeon Run and Cherry Run (Tionesta Creek Watershed), portions of Meade Run and Kinzua Creek in the Kinzua Creek Watershed (middle) and in openings along the Allegheny Reservoir and Kinzua Creek in the Kinzua Creek Watershed (upper).

Since 1986, over 500 stick nests have been found on the ANF, with red-shouldered nests making up over 40% of the nests that have been documented by species. Stick nest monitoring also shows that documented red-shouldered nests are distributed across the ANF with the Tionesta Creek, S. Branch Tionesta Creek, and Spring Creek Watersheds providing the largest concentration of nests. Although there is concern that this species is declining in Pennsylvania, the ANF contains one of the highest densities of this raptor in the state (Brauning, 1992). Based upon the availability of nesting and foraging habitat, breeding bird data collected for the ANF, and available stick nest data, forest-wide populations are believed to be stable. Habitat is plentiful for this species within the project area and is considered to be stable.

Great Blue Heron - Due to its preference for large trees and sensitivity to disturbance, this species is an indicator of old growth or late-successional forest conditions. Old growth is present in South Branch and West Branch Tionesta Creek, and Bear Creek Watersheds and on more isolated plateaus in portions of the Bucklick Sub-watershed, Kinzua Creek Watershed (upper), Kinzua Creek Watershed (middle) and Tionesta Creek Watershed. Two rookeries are known to occur within the mortality zone: one on the far eastern side and one in the south central near Tionesta Creek. Preferred foraging habitat occurs along many of the larger streams including Meade Run, Kinzua Creek, Sugar Run, Tionesta Creek, Spring Creek and Bear Creek, as well as in portions of smaller streams containing active or abandoned beaver ponds.

Although great blue heron are commonly seen foraging along streams or wetlands and have been observed along Tionesta Creek, feeding areas are typically located far from nesting sites (Brauning, 1992). Nests typically occur in more remote areas isolated from disturbance and, for this reason, great blue heron nests have only been documented at 13 sites on the ANF since 1986, and many of these locations only contain 1 or 2 nests. In addition to on-forest nesting, there is also a large heron rookery immediately north of the ANF, in the Quaker Run drainage in New York State. Of the known heron nesting sites on or near the forest, only 4 sites have 5 or more nests. The ANF has been protecting known great blue heron nests since 1986 and continues to retain large blocks of undisturbed forest such as the Tionesta Scenic and Research Natural Area.

Due to this species' sensitivity to disturbance, recent intensive oil and gas development within Salmon Creek and Maple Run drainages may have reduced the suitability of these areas for nesting. Protection of riparian areas and wetlands helps to maintain foraging habitat as relatively stable or unchanged.

Timber Rattlesnake - This species is an indicator of mature forests containing suitable rock outcroppings for denning and basking, as well as regenerating deciduous forest that are utilized for foraging. During the spring and summer months, rattlesnakes are often found on southern exposures or near streams. There are five potential den sites within the project area. Many of the dry oak sites along the Allegheny Reservoir provide the most desirable habitat.

In addition to being a management indicator species, the timber rattlesnake is a forest sensitive species. The BA, Appendix C, discusses the habitat needs and availability, affects of proposed activities and the determination for this species.

Mature Mixed Conifer Species

Hermit Thrush - This is a ground-nesting species and is an indicator of species that utilize mature mixed hemlock communities. Although primarily a forest interior bird, it often occupies edges and small clearings within wooded areas created by natural or man-made disturbances. On the ANF, this species occurs in a variety of forest types in the sapling/pole or older stands. Presently, there are approximately 1,760 acres of the project area typed as a mature conifer community. Mixed hardwood stands that are common in all of the small watersheds could also provide suitable nesting habitat for this species. This species has been found to be relatively common and fairly well distributed on the ANF.

In order to monitor breeding bird habitat on the ANF, 20 transects have been established in 14 habitat types and were first monitored in 1992. In addition, the Northeast Forest Experiment Station has monitored breeding birds at a number of administrative study sites, and songbirds have been monitored at

53 sites across the ANF. Based on this monitoring, the hermit thrush has been found to be relatively common and fairly well distributed across the forest. Preliminary analysis for this species indicates that hermit thrush populations are stable, or possibly increasing (Linda Ordiway, pers. comm.). The 1996 ANF Fish and Wildlife Monitoring and Evaluation Report provides a summary of songbird diversity, as well as an index of relative abundance by habitat type for this species. There has been little change in the preferred habitat for this species within the project area in the last 10 years, and populations and available habitat are considered stable.

Black-throated Green Warbler - This is an upper canopy nester that prefers mature mixed hardwood forests and forages in both deciduous and coniferous trees in the middle to upper levels of the canopy. Although conifer makes up a relatively small portion of each of the small watersheds, there is a wide distribution of conifer in all watersheds that provides preferred nesting habitat for this species.

In order to monitor breeding bird habitat on the ANF, 20 transects have been established in 14 habitat types and were first monitored in 1992. In addition, the Northeast Forest Experiment Station has monitored breeding birds at a number of administrative study sites, and songbirds have been monitored at 53 sites across the ANF. Based on this monitoring, the black-throated blue warbler is well distributed where mature forest conditions predominate and populations of this species are considered stable (Linda Ordiway, pers. comm.). Although not significant, breeding bird survey data indicates this species may be increasing statewide (Brauning, 1992). The 1996 ANF Fish and Wildlife Monitoring and Evaluation Report provide a summary of songbird diversity, as well as an index of relative abundance by habitat type for this species. There has been little change in the preferred habitat for this species within the project area and populations and available habitat are considered stable.

Barred Owl - This species requires large blocks of mature or late-successional forest, and on the ANF, is often associated with moist sites containing a conifer component. Although virtually all of the project area provides suitable habitat for this species, perennial stream bottoms and riparian areas provide preferred nesting habitat, most likely due to the predominance of conifer. This habitat exists along Salmon Creek, Martin Run, Bucklick Run, Sugar Run, Meade Run, Kinzua Creek, South Branch of Tionesta Creek, Meade Run, Tionesta Creek, and much of the Tionesta Creek Scenic and Research Natural Area.

Barred owl data has been collected along seven established survey routes since 1991. Survey routes sample preferred habitat in areas that are actively being managed for timber harvest, as well as in areas that have oil and gas development. Preliminary analysis, based on the number of owls detected, indicates that barred owl populations in the survey areas appear to be stable, and the frequency of detection has remained fairly constant during the analysis period (1991-1998). The level of timber harvest that has occurred within the project area during the last 10 years is comparable to activity in areas where barred owls were sampled. Considering this and since the amount and distribution of barred owl habitat has not changed appreciably in the last 10-20 years, available barred owl habitat and populations within the project area are considered stable.

Species Requiring Regenerating Conifer

Magnolia Warbler - This species is an intermediate canopy nester and is an indicator of a regenerating hemlock community, woodland edges, and clearings. There are very few areas that have regenerating hemlock, thus habitat for this species is presently limited to areas containing an understory hemlock or white pine component. Understory hemlock occurs mainly as small, scattered 1/4-acre inclusions. These

inclusions tend to be concentrated along stream corridors, riparian zones and road corridors. Understory white pine occurs less frequently but was noted during survey in portions of the Kinzua Creek Watershed (upper) and in plateau oak stands within the Salmon Creek Sub-watershed. Additionally, this species has the ability to use several habitats and the full range of forest successional stages (Brauning, 1992).

In order to monitor breeding bird habitat on the ANF, 20 transects have been established in 14 habitat types and were first monitored in 1992. In addition, the Northeast Forest Experiment Station has monitored breeding birds at a number of administrative study sites and songbirds have been monitored at 53 sites across the ANF. Based on this monitoring, the magnolia warbler appears to be well distributed in areas of suitable habitat and populations of this species are considered stable (Linda Ordiway, pers. comm.). The 1996 ANF Fish and Wildlife Monitoring and Evaluation Report provides a summary of songbird diversity, as well as an index of relative abundance by habitat type for this species. There has been little change in the preferred habitat for this species within the project area in the last 10 years; however, populations and available habitat have remained stable.

Cavity-Nesting Species

Yellow-bellied Sapsucker - This species is a cavity nester and is an indicator of mature deciduous forest habitat although it has been found in pastures, orchards, forest edges and clearcuts where some trees remain (Brauning, 1992). Suitable habitat, as mature deciduous forest, is presently available on greater than 79% of the project area.

ANF monitoring for this species includes an assessment of the availability of dead trees, which is included in the 1998 BA for Threatened and Endangered Species, as well as ANF songbird monitoring. In order to monitor breeding bird habitat on the ANF, 20 transects have been established in 14 habitat types and were first monitored in 1992. In addition, the Northeast Forest Experiment Station has monitored breeding birds at a number of administrative study sites and songbirds have been monitored at 53 sites across the forest. Based on the results of this monitoring, the yellow-bellied sapsucker appears to be well distributed across the ANF, and populations of this species are considered stable. The 1996 ANF Fish and Wildlife Monitoring and Evaluation Report provides a summary of songbird diversity, as well as an index of relative abundance by habitat type for this species. There has been little change in the preferred habitat for this species within the project area in the last 10 years, and populations and available habitat are considered stable.

Pileated Woodpecker and Barred Owl - Habitat and trends for these species was described previously. Since both species require large-diameter snags for nesting, they are also included as cavity nesting MIS. Forest-wide monitoring related to the availability of dead trees, including larger diameter snags can be found in the 1998 BA for Threatened and Endangered Species. Riparian areas, which are preferred, nesting habitat for both species, typically have a greater number of large diameter trees based on the fact that buffers are established and adhered to during project implementation. As a result, nesting habitat for these species within the project area is considered adequate and stable.

Upper, Intermediate Canopy (3-20 ft.), and Ground-nesting Species

Habitat and trends for the black-throated green warbler (upper canopy), magnolia warbler (intermediate canopy), and hermit thrush (ground-nesting species) were discussed above.

Species Preferring Aspen

Beaver - This species is an indicator of riparian habitat conditions, particularly with an associated aspen forest community. The following areas provide an aspen component preferred by beaver or have had documented beaver activity: Salmon Creek in the Salmon Sub-watershed, West Branch Bluejay Creek and Slater Run in The Branch Sub-watershed, Spring Creek, Bear Creek Pigeon Run and Maple Run in the Spring Creek Watershed, Ellithorpe Run, Slide Run, and Red Mill drainage (Bear Creek Watershed), Martin, Run, Crane Run, Coon Run and Wolf Run (S.B. Tionesta Creek Watershed), East Branch Tionesta Creek (Thomas Run Sub-watershed), the headwaters of Bucklick Run and Sugar Run (Bucklick Sub-watershed), along much of Kinzua Creek, Meade Run and Windfall Run in the Kinzua Creek Watershed (middle), and along East Branch Tionesta Creek in the Tionesta Creek Watershed. As described previously, this species prefers aspen when available due to the associated high stem density in regenerating aspen and the catkins provided by mature aspen.

Forest-wide monitoring for this species includes habitat mapping using aerial photographs and ground surveys, as well as annual monitoring of beaver harvest data provided by the state. Most of the larger perennial streams on the ANF either currently support beaver, and/or, have had past beaver activity. Due largely to a reduction in fur prices, beaver numbers on the ANF have increased within the past 3-5 years, and many streams that have not had beaver activity for a decade or more, are once again supporting beaver. A minimal amount of aspen increase is due to aspen regeneration cutting and supplemental planting. Based on the increased level of beaver activity across much of the ANF, Forest-wide populations of this species appear to be increasing or stable.

Ruffed Grouse - As described previously, this species prefers aspen when available, due to the associated high stem density in regenerating aspen and the catkins provided by mature aspen. Most aspen within the project area occurs as small remnant clones that are scattered across the project area. Due to age and increased mortality, many of these aspen pockets can no longer be regenerated. Presently, there are 324 acres of aspen stands within the project area specifically managed to benefit wildlife associated with an aspen community. Population trends for this species are discussed above.

Aquatic Species

Brook Trout - This species is an indicator of good water quality conditions in cold-water streams on the ANF. Suitable spawning and resident habitat for this species exists in all perennial streams within the project area. Four streams on the ANF, including Bucklick Run (Bucklick watershed) and Slide Run (Bear Creek Watershed) are currently being monitored on an annual basis to determine long-term trends in habitat variation, water quality and benthic macroinvertebrate populations. Additionally, South Branch Kinzua Creek (Kinzua Creek Watershed (middle) is being considered for inclusion into the State Wilderness Trout Stream program.

The following streams are classified by the Commonwealth of Pennsylvania as cold water or high quality coldwater fisheries, and presently provide suitable spawning and resident brook trout habitat:

Bucklick Sub-watershed	Sugar Run, Bucklick Run
Kinzua Creek watershed (middle)	Windfall Run, Kinzua Creek, Meade Run and Blacksnake Run
Tionesta Creek Watershed	S. Branch Tionesta Creek, E. Branch Tionesta Creek, East Fork Run, West Fork Run, Cherry Run and Martin Run
Kinzua Creek watershed (upper)	Mudlick Run, Dutchman Run and Countyline Run
Salmon Creek Sub-watershed	Little Salmon Creek and Salmon Creek
The Branch Sub-watershed	Bluejay Creek, Slater Run and W.Branch of Bluejay Creek
Spring Creek watershed	Watson Branch, Spring Creek, Gilfoyle Run, Rappe Run, Warner Run and East Branch of Spring Creek
Bear Creek watershed	Wolf Run, Silver Creek, Little Mill Creek, Big Mill Creek, Slide Run, Spencer Run, Pine Run, Bunts Run, Bear Creek, Pigeon Run and Maple Run
S.B. Tionesta Creek Watershed	Crane Run, which is classified as an exceptional value, wilderness trout stream
Thomas Run Sub-watershed	Rock Run and Thomas Run Sub watershed.
W.B. Tionesta Creek Watershed	Hubert Run, Five Mile Run and Two Mile Run

There are a total of 227.72 miles of perennial, cold-water fisheries streams within the mortality zone that makes up the East Side project boundary.

Monitoring of brook trout has been occurring on the ANF since 1991 and four streams, two on each Ranger District, were chosen to monitor trends in native populations and to determine any effects that may occur to the stream courses and brook trout populations. Water quality analysis at these sites indicate that all four streams meet high quality standards for a cold water fishery and all elements measured were within Pennsylvania's Department of Environmental Resources Chapter 93 water quality standards. Brook trout populations across the ANF and within the project area appear stable, but have been affected by extreme high and low flows over the past few years.

Small-mouth Bass and Walleye **-** These two species primarily inhabit the cooler waters of the Allegheny Reservoir and Allegheny River, and small-mouth bass also inhabit the Clarion River and Tionesta Creek.

Since 1991, 35 stations in the Pennsylvania portion of the Allegheny Reservoir have been sampled with gill nets. On average, walleye have comprised 33% of the fish netted and except for 1993 and 1994, walleye have ranked number one in total biomass of the fish sampled (USDA-FS, 1996). Based on monitoring results since 1991, populations of walleye fluctuate, depending on spawning success and survival of stocked fry.

Small-mouth bass have been sampled using night electro fishing surveys on the Allegheny Reservoir since 1991 and rank third in the number of fish sampled USDA-FS, 1996). Recruitment of young fish varies and appears to have been excellent in 1993 and 1994, fair in 1992 and 1996 and poor in 1991 and 1995. Electro fishing surveys have also been used to evaluate the effectiveness of the 1993 and 1996 Christmas tree fish habitat program. The control sites were dominated by young smallmouth bass and darter species, while the catch per unit effort of target species, including walleye, increased tremendously at structure sites. Based upon monitoring conducted since 1991, small-mouth bass populations in the Allegheny Reservoir appear stable.

Unique and Uncommon Plant Communities

Plant communities develop in response to those factors that influence them: hydrology, geology, soils, species composition, browse, ecological processes and the distribution of these factors. Because these factors are not randomly distributed across a landscape, plant communities form patterns, associations, and in some cases, fairly organized groups in response to these factors.

On the ANF, the major factors that influence plant community development are soil type, aspect, moisture regime, and overstory vegetation. Across the ANF landscape, these factors are most commonly characterized by acidic soils, average moisture regimes and a variety of aspects. Less commonly found are combinations of these factors that tend to support unique or uncommon plant communities.

Unique and uncommon plant communities include sites where rare plants have been found or the site has the potential to support unique species of plants. These sites tend to develop in areas where nutrient-rich soils may be different from the surrounding landscape. These soil types have a loam or coarse texture and may benefit from enriched subsurface soil-water flow. The deposition of nutrients increases the amount of calcium and magnesium and provides a medium to support a unique plant community.

These nutrient-rich sites are often found within riparian zones where some of the most diverse plant communities occur due to soil and moisture conditions. On the ANF, riparian areas, wetlands, and floodplains and unique plant communities are identified and given preferential consideration to other resources (USDA-FS, 1986a, pp. 4-6, 4-19 to 4-20). The ANF has been mitigating and protecting unique plant communities in wetlands, riparian areas, and floodplains since the Forest Plan was approved in 1986.

With the availability of geographical information systems (GIS), the ANF has developed a preliminary model that uses several site factors to identify areas that may have the potential to support unique or uncommon plant communities. This plant model identifies sites that tend to have rich soils and moisture regimes that may be characteristic of supporting a more diverse plant community, including a number of species listed or proposed for listing under Pennsylvania Wild Plant Conservation Act.

Using the GIS plant model, potential habitat for unique or uncommon plant communities was identified in all 11 watersheds or sub-watersheds under analysis in the East Side project area. From these watersheds and sub-watersheds, 42 stands were identified as potentially suitable for supporting unique plant communities. Future management will include monitoring of sites identified with the model to validate the model and identify unique or uncommon plant communities within the project area. Methodology used to develop the ANF plant model and the maps for East Side can be found in the project file, including site factors used and a list of indicator plant species characteristic of site conditions predicted by the model.

Landscape Patterns

A landscape pattern approach will be used to display community availability and distribution. Landscapes can be defined as a mosaic of landforms and vegetation types (Urban et al. 1987). To simplify, a landscape is an array of interacting ecosystems. The key word is interacting. Landscape does not imply any specific size but is a function of the species or ecological processes being considered. The wildlife species on the ANF have home ranges that require a variety of habitats and distribution of these habitats. For example, a community that supports a population of salamanders may function only as a foraging patch for an owl.

Although the abundance of many species is more closely associated with landscape composition than with landscape pattern (McGarigal 1993), landscape pattern can influence linkages among populations. Landscape ecologists have become more sensitive to processes that occur across ecosystem barriers. To prevent population sinks and extinction, it is important to maintain ecosystems distributed across the landscape and consider home range movement, migration, dispersal and geographic range shifts where they apply. Hunter (1996) states it as having natural ecosystems and production areas imbedded in a matrix of multiple use ecosystems and assuring that management of this matrix is done in an ecologically sensitive way that will allow organisms to move through freely.

This design approach promotes biodiversity by distributing habitats over a broad geographic area to allow breeding individuals to interact within and among population, spatially, and among generations temporally (Marcot et al, 1992). Hunter (1996) applies this principle to sustain communities and their functions. Some of the concepts used to analyze the effects of management and to ensure retention of communities are:

- Look beyond the boundaries of forested patches to the ecosystems that form the larger matrix in which these are imbedded.
- A large community patch is preferable (specifically forested patches) but when not possible, place small ones close to limit isolation.
- Forest and non-forest patches should be placed to cover more ecological land types, more features and more environmental conditions.
- Make patches as circular as possible (harvest unit or community patches).
- Reduce isolation of communities (specifically forested patches)

Within any landscape, some areas function predominantly as one ecosystem. The mortality zone is no exception. Some areas provide dry oak communities, open wetlands, or orchard savannas. For this analysis, these community patterns were identified in addition to the availability of corridors to connect communities. The affects of management on these patterns will be discussed in the environmental consequences section. The corridors within the mortality zone are mature forest 51+ years of age.

The sub-watersheds of Salmon Creek have a diverse representation of community types including openings, riparian, and features including conifer and oak. The dominant community type is mature forest. The northeast portion of the area appears to function best as opening and early successional communities, although these community types are represented across the sub-watershed. The southern half has more mature forest, and the western portion provides the largest continuous mature forest patch. Two streams on the headwaters of Little Salmon Creek have narrow corridors between 11-20 year vegetation and openings, however, there are no isolated communities. There is little conifer component within the area. The riparian areas are narrow flood plains and scattered, large upper bottoms.

The southern half of the The Branch Sub-watershed is predominantly openings, 0-10, 11-20 year vegetation and mature conifer. The northeast portion is a continuous mature forest patch. Mature forest is the dominant community and although the southern half provides early successional communities, connectivity of mature forest habitat is maintained. Upper bottoms appear to be the dominant riparian community type.

Within the Spring Creek Watershed, the west and south portion provides a large mature forest patch; the dominant vegetation is conifer. There are three openings within this area. The remaining portion provides a variety of community types such as 0-10, 11-20, 21-50 and 51+ year vegetation and openings. A

concentration of early successional and opening habitat occurs in the East Branch Spring Creek drainage. There are some narrow corridors of mature forest, but no isolated areas. The riparian areas are represented by depression, upper bottom, and floodplain ELTs.

The Bear Creek Watershed has a good representation of community types, the dominant being mature forest. Early successional and opening habitat, as well as a conifer component, is adjacent to Bear Creek. The largest continuous mature forest patch exists on the southeast portion. The majority of riparian community is floodplain but large areas of depression exist in the southeast and northwest corners.

The majority of the South Branch Tionesta Creek Watershed is mature forest with few openings. A majority of early successional vegetation occurs along Crane Run. Mature conifer is a minor component and is mostly on the east side of the area. The largest continuous mature forest patch is located above the private land on the northwest side. In addition, the Tionesta Creek Research Natural Area lies adjacent to this group of small watersheds and provides continuous old growth habitat. The central and southeast riparian zones are represented by wide upper bottom delineation. There is one narrow stream corridor and no isolated communities.

Thomas Run Sub-watershed has a majority of mature forest habitat. There are some stands of opening and early successional vegetation along Rock Run. Mature conifer and aspen occur in the northeast corner. Very narrow floodplains and upper bottoms dominate the riparian zones plus three large units of depression ELTs. No narrow corridors or isolated communities occur.

Mature forest is the dominant community type within the West Branch of Tionesta Creek Watershed, including large areas of mature conifer. Early successional vegetation and openings do not occur across the whole area but are concentrated on the southeast portion. Large depression ELTs are predominant within these small watersheds. Upland sphagnum swamps have been documented to occur. No narrow corridors or isolated communities were observed.

Mature forest is the dominant community type within the Bucklick Sub-watershed, including old growth stands (111+ year old). There is a small representation of 11-20 year old stands. There is a significant presence and distribution of mature conifer specifically along Sugar Run and Bucklick Run with very few openings. The riparian zones are narrow upper bottoms.

The Kinzua Creek Watershed (upper) is predominantly continuous mature forest with a mature oak and mature conifer component. Few openings exist throughout except for the large savannah adjacent to Kinzua Creek. Riparian zones are narrow upper bottoms. No isolated communities occur.

The Kinzua Creek Watershed (middle) has a dominant continuous mature forest cover with a large component of mature conifer and old growth (111+ year). Openings and 0-20 year old vegetation are distributed evenly throughout. The largest patches of mature forest are south of Kinzua Creek and Meade Run. There are at least two narrow forest corridors but no isolated areas. The riparian zones along Meade Run and Kinzua Creek are wide floodplains. A large depression occurs on the lower east side near Windfall Run.

Tionesta Creek watershed has a dominant mature forest cover with old growth (111+ year) and mature conifer components with the largest continuous forest patch above Tionesta Scenic and Research Natural Area. Early successional and opening vegetation are centrally located. The riparian areas are narrow flood plains along the south branch of Tionesta Creek, narrow upper bottoms along Martin and Pigeon Runs and a wide upper bottom along Cherry Run.

Fragmentation

The amount of wildlife habitat has been quantified across the project area and displays the diversity of habitat by vegetation type and age. Fragmentation, the breaking up of continuous habitats, can also be quantified by measuring reduced size of certain habitats, increased edge, reduced interior area, increased isolation of patches and possibly increased number of patches and decreased average patch size. Often a single measure will be used to evaluate fragmentation that does not provide a clear picture of what is occurring on the landscape (Davidson, 1998).

There are 2 basic solutions to the lack of an overall index of fragmentation. Because different aspects of fragmentation will affect different species, the first is to select the single aspect of fragmentation that is of most concern to the area (Lehmkuhl and Ruggiero 1991, van Dorp and Opdam 1987). The second approach to measuring fragmentation is to use several units of measure. Two issues related to fragmentation have been raised as a concern during analysis of proposed projects on the Allegheny National Forest. The first is that large forest patches are maintained and the second is that all communities are connected by a travel corridor system to facilitate dispersal and gene flow.

In past projects, interior to edge ratios were calculated to determine availability of interior habitat, specifically for migratory songbirds. However, perimeter to area ratios may change unpredictably (Laurance and Yensen, 1991) and the ratios do not capture important aspects of fragmentation, such as isolation. The interior to edge ratio was not calculated for the East Side project. The area will continue to provide large, undisturbed forested patches.

Robinson (1997) notes that brood parasitism is high only in areas immediately adjacent (within 600 feet) to openings where cowbirds feed and are common. An observation was made by a research biologist that in his studies of songbird populations within the Allegheny National Forest, he documented less than 15 cowbirds out of 8000 birds censused in either early successional (clearcut) or other forest successional stages, including old growth. He concluded that because of this information, there couldn't be an effect of nest parasitism by cowbirds on interior forest songbirds (deCalesta, 1998).

DeCalesta (1998) further suggests that even aged timber harvest like that proposed in the East Side project, will not result in forest fragmentation, but rather habitat fragmentation, creating different habitats for a multitude of species. This is supported by ANF monitoring. Sites manipulated by even-aged forest practices, similar to those proposed in East Side, contain a similar compliment of interior-forest songbirds, amphibians, and mammals when compared to uncut, second-growth and old growth habitat (deCalesta 1998).

Threatened, Endangered, and Regionally Sensitive Species

Habitat for Federally proposed, threatened, and endangered species and Regionally sensitive species is an important consideration when assessing potential impacts to biological diversity. Table 1 in Appendix C includes the 31 species considered for the ANF. A detailed description of each species habitat and distribution on the ANF can be found in Appendix C.

Environmental Consequences

Effects on wildlife and wildlife habitat will be evaluated by: 1.) looking at the direct and indirect effects of proposed or anticipated activities; 2.) comparing the present condition with anticipated changes by alternative; and 3.) evaluation of potential effects that are most likely to result in a change in wildlife habitat conditions and wildlife distribution and use within the watershed, when considered cumulatively over time. Analysis of wildlife habitat and effects are projected out a minimum of 20 years to the end of the planning decade (2019) or the foreseeable future. However some effects, such as long-term changes associated with regeneration cutting are evaluated for up to 50 years into the future.

Direct and Indirect Effects of Treatments

Anticipated changes in understory and overstory condition are described in the Vegetation section. This discussion includes changes in structural conditions that will affect wildlife communities in the affected stands. The following is a brief summary of the direct and indirect effects of these treatments on the wildlife communities within the project area. Treatments by alternative within the project area can be seen in the vegetation section.

Even-aged Intermediate Harvests

In Alternatives 1 and 3, intermediate harvests include green thinning and salvage thinning. Green thinnings occur in well-stocked stands and result in up to 1/3 of the live overstory being removed in harvest. Post-harvest condition results in an evenly-distributed, moderately-stocked overstory composed of a mix of 12 - 20+ diameter trees and pole size trees less then 12 inches in diameter. Intermediate thinnings are prescribed on 1,776 acres in Alternative 1 and 533 acres in Alternative 3. The vegetation conditions resulting from this treatment will not occur under Alternatives 2, 4 and 5.

In Alternatives 1, 3 and 4, salvage thinnings occur in stands that have a wide range of pre-harvest conditions. Pre-harvest stocking (measure of the level of occupancy of vegetation) may range from 40-100%. The objective of salvage thinnings is to remove the dead and dying trees, however, in stands where initial stocking levels are high, healthy trees are removed along with the dead and dying. Post harvest conditions in salvage thinnings are not as predictable as in green thinnings and depending on the degree and evenness of mortality and decline in the original stand, post harvest conditions may be more or less uniform. Five to ten standing dead trees greater than nine inches would remain in the stand after harvest per Forest Plan standards and guidelines. Salvage thinnings are proposed on 2,467 acres in Alternative 1; 1,909 acres in Alternative 3 and 2,473 acres in Alternative 4. No salvage thinnings are proposed under Alternative 5 thus these conditions would not develop under Alternative 5.

In Alternative 2, salvage thinnings occur in stands that have a wide range of pre-harvest conditions. Pre-harvest stocking (measure of the level of occupancy of vegetation) may range from 40-100%. The objective of salvage thinnings is to remove the dead and dying trees. As described above, post harvest conditions are not as predictable as in green thinnings and depending on the degree and evenness of mortality and decline in the original stand, conditions may be more or less uniform. Standing dead trees would remain in the stand after harvest per marking guidelines and Forest Plan standards and guidelines. Salvage thinnings are proposed on 4,219 acres in Alternative 2.

Direct effects to wildlife from these types of treatments are generally short term and include disturbance or displacement when logging occurs, or possible mortality of individuals. While cutting may result in

avoidance by some species sensitive to disturbance, other species are attracted to logging due to the short-term increase in browse and cover provided by increased levels of slash. This type of harvest maintains a reduced mature overstory, but does alter stand structure and understory conditions by removing small to medium diameter trees and by increasing light levels to the forest floor. Some groups of species, such as forest bats and raptors may benefit from a partially open canopy and mid-story.

For species that utilize roost and den trees, intermediate timber harvest results in an insignificant loss of potential roost trees. Millions of potential roost trees are available across the forest and an average of <1% of the forest receives an intermediate thinning in a year. A minimum of 5-10 snags per acre greater than 9 inches dbh will be maintained in all salvage treatments and all snags will be maintained in green treatments unless they pose a hazard to the operator.

Even-aged Regeneration Harvests

In Alternatives 1 and 3, even-aged regeneration harvests include clearcuts, shelterwood seed/shelterwood removal cuts, shelterwood removals, delayed shelterwood removals, two-age prep cut and two age cuts. The objective of these treatments (other than two-age prep and two age cuts) is to establish a new even-aged forested stand composed primarily of hardwood tree species. The successful establishment of seedlings most often occurs only when the full complement of reforestation treatments are applied. These treatments may include any or all of the following: herbicide, area fencing, striped maple and beech cutting, chain-saw site prep and fertilization. Two-age prep and two age harvests are similar to the other regeneration harvest in that a new age class of seedlings becomes established, however, more trees are left on-site after harvest. Clearcuts and shelterwood removal (where seedlings are already present) could occur with a first entry. In stands where seedlings do not presently occur, shelterwood removals may not occur for 3-10 years.

Direct effects of these treatments on wildlife differ from those of intermediate treatments described above, in that most of the mature overstory is removed. While partial treatments result in relatively minor changes in wildlife distribution and use, regeneration cutting can result in a much more dramatic change in wildlife use because many mature forest species may be displaced for longer periods of time. Removal of most of the mature overstory results in a rapid change of conditions in the first 10 - 15 years and may result in an increase in herbaceous vegetation (grasses/forbs), shrubs (blackberry) and tree seedlings. This flush of understory vegetation also provides habitat for early successional species and mature forest species that also utilize seedling/sapling habitat for reproduction/feeding. The pattern of harvests prescribed under Alternatives 1 and 3 will provide early successional vegetation for the next 18 years. This will specifically benefit the 8 species that exclusively utilize this habitat type and no longer use vegetation when it is 7-10 years of age (Table 84). Wildlife species that are dependent on mature forest stands may be displaced for up to 50 years until mature forest conditions are reestablished.

Effects on wildlife from regeneration cutting vary greatly over time. DeGraaf et al (1992) found that regenerating vegetation has its greatest benefit to wildlife when trees are generally less than 10-15 years old. This is due to the relatively short-lived nature of edges created between stands and because the importance of these edges to the bird community (the group of species most sensitive to habitat structure) diminishes after 10-15 years. As a result, rapid changes in bird species are expected to occur during the first few years after regeneration cutting. On the ANF, reserve and wildlife trees are retained during all regeneration harvest activities. As a result, the species present following regeneration harvest with reserve wildlife trees is expected to be similar to those that occupy the regeneration stage under natural succession (DeGraaf et al. 1992). Removal cutting is expected to favor early successional species over species that prefer or require mature forest conditions. Table 84 displays some of the changes in the bird community over time that would be expected to occur in stands affected by regeneration harvest.

Table 84. Year in Which Breeding Bird Species First Appear, Become Common and Decline in Seedling and Sapling Stands of Northern Hardwoods (Degraaf et al 1992)

SPECIES	**Year First Appeared**	**Year Become Common**	**Year of Decline**
Eastern bluebird	1	1	2
Northern flicker	1	1	7-10
Winter wren	1	1	2
Swainson's thrush	2	4	15[1]
Chestnut-sided warbler	2	4	10
Mourning warbler	2	5	7-10
Common yellowthroat	2	6	10
American Goldfinch	2	6	7-10
Cedar Waxwing	2	4	7-10
Veery	3	6	1
Black and white warbler	3	4	15[1]
Rose-breasted grosbeak	3	15	1
Canada warbler	5	15	1
Ruffed grouse	10	15	1
Wood thrush[1]	10	15	1
Ovenbird[1]	10	15	1
Black-throated blue warbler[2]	15	1	1
Black-throated green warbler[2]	15	1	1

1 Present throughout the remainder of the developing stand.
2 Breeding bird data collected on the ANF indicates that these species first appear 5 -10 years after the stand receives a removal cut.

First entry regeneration harvests are proposed on 442 acres in Alternative 1 and 367 acres in Alternative 3. Second entry regeneration harvests (3-10 years) are proposed on 2,848 acres of Alternative 1 and 2,136 acres of Alternative 3. These regeneration harvests would provide a mosaic of successional stages across the landscape insuring that habitat for early successional species as well as mature and late-successional species are maintained over the long term without causing major disruption to forest landscape patterns. Displacement of wildlife due to increased human activity during the timber operation would be short in duration with similar habitats available in the surrounding landscape.

No regeneration harvests are proposed under Alternatives 2 and 5. With more than two thirds of the proposed treatment stands containing interfering vegetation, no regeneration harvests and accompanying reforestation activities could result in few new tree seedlings and ultimately, vast areas largely devoid of large living trees. Under these circumstances, in the long term, the quality and quantity of early successional and mature forest habitat would be significantly diminished. Ferns, striped maple and beech may dominate areas with sparse overstories that could result in few new tree seedlings to develop. If these conditions occur, wildlife species requiring mature and late-successional forests would not find quality habitat conditions that would meet their entire habitat needs.

Alternative 4 does not include any regeneration harvests but does include 7,110 acres of reforestation treatments. These reforestation treatments would help establish new tree seedling to sustain a forested condition over the long term.

Uneven-aged Regeneration Harvests

Uneven-aged prep and uneven-age selection are proposed on 445 acres of Alternative 1, 376 acres of Alternative 3 and 2,863 acres of Alternative 4. Uneven-aged management has been proposed in stands where it is thought to be biologically feasible. The method of selection is described in detail in the vegetation section of Chapter 3. On a majority of stands, beech root suckers are considered the source of the new stand although it is not known whether beech will survive the current invasion of beech bark disease to develop into a large tree component of future stands. Small openings created by the removal of individual trees or groups of trees would not be large enough to create early successional habitat of any consequence. Successful establishment of seedlings could occur if reforestation treatments were applied such as; herbicide, fencing, striped maple and beech cutting and chainsaw site preparation.

Individual Tree Selection Harvest

This treatment involves removing up to one-third of the overstory trees in all size classes throughout the stand (in contrast to intermediate thinnings which remove more small trees) and retaining approximately two-thirds of the overstory. The vegetation objective of this treatment is to establish a new age class of seedling regeneration in every entry, and to allow enough light and growing space to occur to promote the growth and development of existing saplings, medium to large diameter trees, as well as promote new seedling growth and establishment. A continuous forest overstory is maintained which provides habitat for species that require mature and late successional habitat conditions. While shade tolerant tree seedlings may be established, selection harvest will not result in establishment of the dense seedling vegetation required by many early successional wildlife species.

These post harvest conditions would develop as a result of individual tree selection on 158 acres in Alternative 1, 89 acres in Alternative 3 and 2,594 acres in Alternative 4. No individual tree selection harvest will occur under Alternative 2 and 5, and understory and overstory conditions will remain unchanged in the short term. In the long term, overstory conditions may deteriorate on portions of the salvage removal acres proposed for this treatment which are experiencing mortality and decline and canopy conditions may change from a closed canopy to partial canopy conditions, depending on the level of future mortality.

Group Selection Harvest

Group selection harvest is similar to individual tree selection in that up to 1/3 of the overstory might be removed, distributed in all size classes, but only on 80-85% of the stand. The overstory trees would be removed on the remaining 15-20% of the stands in small groups that do not exceed 1/2 acre in size. This results in an overstory that is generally continuous, but has small gaps interspersed throughout the stand. The objective of the treatment is to establish regeneration in the small groups, and allows the areas between the groups to develop. This activity would retain habitat for species that require mature and late successional habitat conditions. Although the groups provide small pockets of early successional vegetation, they are not large enough to support species that require this type of habitat. Species sensitive to disturbance will likely move off the area during logging.

These conditions would develop where group selection harvest is proposed on 269 acres of Alternatives 1, 3 and 4. No group selection treatment is proposed in Alternatives 2 and 5. Conditions will remain the

same in the short term and the establishment of seedlings on 20% of the area may not occur in the long term.

Effects of Reforestation Treatments

Reforestation treatments include herbicide application, area fencing, aerial fertilization, site preparation and conifer and hardwood planting and are prescribed in combination with both even-age and un-even aged treatments. The anticipated change in understory conditions is described under the vegetation section in this chapter. The effects of these changes on the wildlife community will vary and are described below.

Herbicide Application

Effects of herbicide application on aquatic and terrestrial communities can be found in Chapter 4 of the ANF Understory Vegetation Management FEIS. In addition, the 1992 Understory Management EA appeal decision letter provides a summary of effects to non-target organisms. There is no herbicide application proposed in any riparian habitat associated with perennial or intermittent streams (Upper Bottom and Floodplain ELT's in Table 83), and wildlife in these areas is not expected to be adversely affected. Also, the following mitigation measure will be implemented to ensure herbicides are not applied over seeps, springs or wetlands and the associated wildlife communities.

No herbicide will be sprayed on any stream or spring seep. A 25 ft. buffer will be maintained around small seep areas that do not have an outflow channel draining into a stream and a 50 ft. buffer will be maintained around any springs that drain into a stream (Forest Plan, p. 4-25).

Based on the analysis provided in the ANF Understory Vegetation Management EIS, avoidance of perennial and intermittent stream riparian habitat and with implementation of the above mitigation measure, there are no significant effects anticipated to any unique wildlife communities as a result of proposed herbicide application.

The use of herbicides results in conditions where seedlings are more likely to be established. In the long term, these areas, in combination with even-aged regeneration cut, become early successional habitat and in combination with an uneven-age regeneration cut, helps establish a seedling understory. Both resulting conditions will provide an element of structure that is currently lacking in most stands.

Herbicide treatment is proposed on 3,487 acres of Alternative 1, 3,006 acres of Alternative 3, and 1,983 in Alternative 4. No herbicide application is proposed under Alternatives 2 and 5, and there will be no direct or indirect effects of this treatment on the wildlife community under these alternatives. Conversely, the resulting conditions will not develop.

Area Fencing

Area fencing protects developing seedling growth until it is no longer vulnerable to deer browsing and is proposed in order to reduce deer browsing on sites where we are trying to establish seedling regeneration. Movements for large mammals will be somewhat restricted by fencing, most other species are not affected. In East Side, stands proposed for fencing range in size from 2 to 62 acres. In some cases, larger fenced areas could result if several adjacent stands are fenced in one unit.

Area fencing is proposed on 2,316 acres in Alternative 1; 1,977 acres in Alternative 3; and 1,037 acres in Alternative 4. No area fencing is proposed under Alternatives 2 and 5, and there will be no direct, or indirect effects of this treatment on the wildlife community under these alternatives. Conversely, seedling growth will not be protected.

Fertilization

Fertilization accelerates the growth of woody vegetation, particularly black cherry. Since this essentially speeds up development of sapling size trees, the primary effect of this treatment on wildlife is that the availability of seedling habitat is shortened or reduced somewhat in the short term.

Fertilization is proposed on 1,322 acres in Alternative 1 and 1,103 acres in Alternative 3. No fertilization is proposed under Alternatives 2, 4 and 5, and there will be no direct or indirect effects on the wildlife community under these alternatives.

Site Preparation

This treatment involves removal of woody vegetation, usually beech, striped maple, birch and pin cherry. The removal of this understory vegetation reduces or eliminates habitat for some intermediate canopy nesting birds for five to eight years or until the removal cut is completed. This treatment may affect tree species composition and will affect stand structure on these sites. Timber Stand Improvement (TSI) work also includes 2 sites in mature oak transition stands. This treatment is expected to improve wildlife habitat since small diameter hardwood trees will be removed to promote mast production in residual oak. This treatment will also release understory white pine and promote the development of conifer on these sites. Non-commercial conifer release is also proposed on 66 acres. This will involve removal of smaller diameter hardwoods to promote the development of understory white pine.

Site preparation or removal of understory beech and striped maple could have a direct effect on nesting songbirds. However, a seasonal restriction has been applied to all units receiving this treatment that will reduce the number of nesting songbirds that are affected. The cumulative affect of reducing the amount of understory vegetation is expected to be minimal based on the fact that understory vegetation is being replaced and because such a small percentage of the forest receives this management treatment.

There are 3,093 acres of site preparation proposed in Alternative 1; 2,617 acres in Alternative 3; and 2,638 acres in Alternative 4. No site preparation, TSI, or non-commercial release treatments are proposed under Alternatives 2 and 5. There will be no direct or indirect effects of these treatments on wildlife under these alternatives.

Planting

Varying amounts of conifer, hardwoods and shrub plantings are proposed. The objectives of these treatments are to improve or restore plant diversity and structure in the next stand. Many species of wildlife that reproduce or forage in forested stands require or prefer a deciduous shrub or conifer inclusion in the understory. Understory shrub and confer planting, is expected to better meet the needs of these species. Since it will take 10 to 20 years for shrubs to fully develop and 15-50 years for conifer to develop in the affected stands, there are no immediate benefits to wildlife anticipated, and wildlife related benefits are expected to occur at some point in the future after the planted stock becomes established and develops.

There are 815 acres of planting under Alternative 1; 725 acres under Alternative 3; and 302 acres under Alternative 4. In addition, 668 acres of planting to enhance wildlife habitat has been proposed for Alternatives 1, 3 and 4. No conifer or shrub planting is proposed under Alternatives 2 and 5, and anticipated long-term improvements would not occur.

Effects on Future Old Growth and Late Successional Forest Habitat

Over 76% of the project area provides mature forest conditions, and 4,189 acres are stands of 111 years of age that would be considered late successional forest or potential old growth (Forest Plan FEIS 4-73). Timber harvest and reforestation treatments on 8,223 acres under Alternatives 1, 2, 3 and 4 will affect mature forest in the project area. While mature forest conditions predominate on the acreage affected, none of the stands proposed for treatment provide a species composition or stand structure that would make them more desirable old growth candidates. As a result, proposed activities will not reduce or eliminate opportunities to provide future old growth within the project area. Additionally, mature forest will continue to exist on an average of 116,000 acres or 69% of the project area under all alternatives and will continue to provide future late successional or old growth habitat.

The Forest Plan requires that old growth habitat be provided on a minimum of 5% of the area in MA 3.0 (Forest Plan, p. 4-84) and 10% of the area within MA 6.1. Additionally within MA 6.1, this should be distributed so that at least 100 of every 1,000 acres contain future old growth (Forest Plan, p. 4-113). This area comprises approximately 69% and 6% of MA 3.0 and 6.1 respectively. While only time will tell whether or not these sites will provide the desired old growth characteristics, there are no activities proposed under any alternatives that would affect the ability of these stands to provide future late successional or old growth conditions.

Based on the above analysis, all alternatives meet Forest Plan direction related to the amount and distribution of old growth.

Wildlife and Fish Habitat Improvement

The following proposed activities are summarized by alternative within the project area boundary see Table 85). Stand specific wildlife proposals are listed in the wildlife report, Appendix C.

Table 85. Wildlife Treatments by Alternative (Acres) MA-3.0

TREATMENT	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Create and maintain opening (associated with commercial clear cut)	15	0	0	5	0
Create and maintain openings (doze, seed and fertilize)	3	0	3	3	0
Regenerate aspen	92	0	92	92	0
Seeding	54	0	54	54	0
Planting	466	0	466	466	0
Fencing	43	0	43	43	0
Prune and Release Apple Trees (108 trees)	36	0	36	36	0
Release mast producing shrubs/trees	14	0	14	14	0
Conifer Release	36	0	36	36	0
Nest boxes	14	0	14	14	0
Catch Basins and Fish Structures	9	0	9	9	0
Construct water holes	7	0	7	7	0
Wildlife Treatments by Alternative (Acres) MA-2.0					
TREATMENT	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5
Planting	187	0	187	187	0
Wildlife Treatments by Alternative (Acres) MA-6.1					
TREATMENT	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5
Planting	15	0	15	15	0

Fruit Tree Pruning and Release **-** The purpose of pruning is to improve the health and vigor of existing apple trees by removing dead wood and non-fruit bearing branches and opening up the tree canopy to sunlight enhances fruit production. Release treatments remove competing trees for a radius of approximately 10-25 feet around the apple tree. This improves the overall health of the apple tree, as well as increases fruit production. The value of apples to wildlife is well documented. Grouse and black bear in particular make use of this resource on the ANF. Wildlife related benefits of these treatments are two-fold. By enhancing fruit production, apples will provide a more consistent source of soft mast. Also by removing dead wood from the apple tree and removing competing vegetation around the tree, the health and vigor and the expected life of the apple tree will be improved.

No apple tree pruning or release is proposed under Alternative 2 and 5, and the above effects are not expected to occur. In the short term under this alternative, existing trees will continue to provide fruit for wildlife. Over the long term (10-25 years), fruit production will be reduced somewhat, and the life expectancy of trees with large amounts of dead wood will be reduced

Grass/Forbs Seeding **-** The primary objective of this treatment involves seeding landings and skid trails with a grass/forb mix to stabilize sites disturbed during logging. The seed mix used includes species that will stabilize the sites, as well as provide forage and cover for wildlife. Individual sites seeded are

approximately ¼-acre in size and will be well distributed in all units proposed for timber harvest. In addition, there will be approximately 1 - 5 acres of seeding done under each alternative to secure landings and skid trails. There are no adverse effects to wildlife anticipated as a result of proposed seeding.

Opening Construction and Maintenance **-** Opening construction is accomplished by discing, seeding, liming and fertilizing an opening. Herbaceous openings are maintained by mowing, and prescribed burning is required for openings of warm season grasses. These treatments are expected to benefit a variety of game and non-game wildlife by improving herbaceous ground cover conditions and by maintaining native grasses. Many existing openings are covered with non-palatable, invasive grasses and weeds. Without regular maintenance these grasses and weeds would compete with desirable vegetation and eventually dominate the site. Prescribed maintenance prepares the substrate so that warm season grasses or legumes can re-seed, thus retaining herbaceous cover. There are 18 acres of opening construction and maintenance proposed under Alternative 1; 3 acres under Alternative 3; and 8 acres under Alternative 4. Fifty-four acres of seeding are proposed under Alternatives 1,3 and 4. Direct, short term effects to wildlife may include disturbance from machines and human access. There are no adverse effects to wildlife anticipated as a result of proposed opening construction or maintenance.

Non-forest Shrub and Conifer Planting and Fencing **-** All of this planting will occur in existing openings, and the objective is to enhance non-forest habitat by improving cover/forage conditions. This treatment is expected to benefit a variety of game and non-game wildlife by improving nesting and hiding cover, as well as by providing a more reliable source of soft mast. Only native shrubs will be used, and species will be selected to provide fruit production throughout the year. Fencing is proposed to protect planted stock from deer, since experience on the ANF has shown that most native shrubs cannot be established without protection from browsing. Proposed fencing will involve a combination of the following: 1.) construction of individual 6 foot fences around planted shrubs; 2.) construction of 10X40 foot cribs in which 10-15 plants will be planted; and 3.) use of 5-foot individual tree shelters. Selection for the type of protection will vary with the species of shrub selected, as well as by site. Some maintenance is required for any type of fence units. There are no adverse effects to wildlife anticipated as a result of proposed fencing.

No shrub planting or fencing is proposed under Alternatives 2 and 5 and anticipated benefits of shrub planting will not occur under these Alternatives.

Direct Mortality on Wildlife

Since many of the proposed timber harvest and reforestation treatments could occur during the breeding season, effects would include possible direct mortality of less mobile individuals, including migratory bird nests and/or eggs. Available habitat for wildlife within the project area is displayed in Table 82 and Table 83. Preliminary analysis on 22 breeding bird transects on 11 different habitats indicate that a diverse assemblage of songbirds exist in a variety of habitats throughout the ANF. Although habitat for migratory birds, sensitive species, and Pennsylvania species of special concern may be affected by proposed activities, implementation of Forest Plan standards and guidelines, site-specific mitigation measures (pp. III-15, III-24-27, III-41, III-46-47 and III-49-50), and protection of riparian, wetland, and specialized habitats will ensure that suitable habitat conditions for all wildlife that presently utilize the project area will continue to be available. The population viability of all management indicator species will be maintained. Based on recent court rulings that habitat modification does not constitute a "taking" under the Migratory Bird Treaty Act (MBTA) (Seattle Audubon Society v. Evans and Mahler v. Forest Service), all proposed activities are in compliance with the MBTA. Also the Biological Assessment (Appendix C) for this project addresses effects on threatened, endangered, and sensitive species, where population viability may be of concern.

Changes in Available Habitat within the Small Watersheds

Information presented in Table 86 can be used to compare the current diversity of wildlife habitats and the habitat diversity that would be expected with implementation of each of the alternatives over the short-term. This includes all Forest Service activities and anticipated oil and gas activities proposed within the small watersheds. The biggest difference between alternatives is in the availability of seedling habitat which will not develop under Alternatives 2 and 5 and which will increase under Alternatives 1, 3 and 4. While Alternative 4 will result in establishment of up to 80 acres of seedling habitat, due to the small size of the patches created, habitat for many early successional species would be reduced under this alternative. Over 150 wildlife species on the ANF utilize a combination of mature and seedling-aged forest for feeding and/or reproduction. Alternatives 1 through 4 would improve habitat for these species. Habitat for these species would remain unchanged under Alternative 5 by the end of the planning decade. The conifer and aspen component will not decrease and increases by planting will be displayed under the wildlife alternatives.

Over the long term, a forested condition in affected areas could not be sustained under Alternatives 2 and 5. Lack of regeneration harvest and associated reforestation treatments would result in a landscape with large areas devoid of live mature trees. A monoculture of ferns on the ground layer, and beech saplings and striped maple in the shrub layer would be the dominant vegetation over more than 11,000 acres. The 163 species of reptiles, amphibians, mammals and birds that utilize mature hardwood forests could not be sustained in these areas over the long term.

Table 86. Small Watersheds—Estimated Acres By Present Condition/Alternative

		ACRES BY PRESENT CONDITION/ALTERNATIVE					
	HABITAT COMPONENT	**Present Condition**	**ALT 1**	**ALT 2**	**ALT 3**	**ALT 4**	**ALT 5**
Salmon Creek Sub-watershed	Forested Size Class						
	· Seedling (0-10 yrs)	508	159	0	159	0	0
	· Sapling (11-20 yrs)	267	508	508	508	508	508
	· Sawtimber (51+ yrs)	8,041	7,882	8,041	7,882	8,041	8,041
	Non-Forested Cover Types						
	· Grass/Forb	595	595	595	595	595	595
	HABITAT COMPONENT	**Present Condition**	**ALT 1**	**ALT 2**	**ALT 3**	**ALT 4**	**ALT 5**
The Branch Sub-watershed	Forested Size Class						
	· Seedling (0-10 yrs)	484	109	0	109	0	0
	· Sapling (11-20 yrs)	536	484	484	484	484	484
	· Sawtimber (51+ yrs)	5,731	5,622	5,731	5,622	5,731	5,731
	Non-Forested Cover Types						
	· Grass/Forb	640	640	640	640	640	640

	HABITAT COMPONENT	Present Condition	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5
Spring Creek Watershed	Forested Size Class						
	· Seedling (0-10 yrs)	591	596	0	455	0	0
	· Sapling (11-20 yrs)	764	591	591	591	591	591
	· Sawtimber (51+ yrs)	10,680	10,084	10,680	10,225	10,680	10,680
	Non-Forested Cover Types						
	· Grass/Forb	443	443	443	443	443	443
	HABITAT COMPONENT	**Present Condition**	**ALT 1**	**ALT 2**	**ALT 3**	**ALT 4**	**ALT 5**
Bear Creek Watershed	Forested Size Class						
	· Seedling (0-10 yrs)	1155	921	0	880	0	0
	· Sapling (11-20 yrs)	635	1155	1155	1155	1155	1155
	· Sawtimber (51+ yrs)	12,766	11,845	12,766	11,886	12,766	12,766
	Non-Forested Cover Types						
	· Grass/Forb	414	414	414	414	414	414
	HABITAT COMPONENT	**Present Condition**	**ALT 1**	**ALT 2**	**ALT 3**	**ALT 4**	**ALT 5**
South Branch of Tionesta Creek Watershed	Forested Size Class						
	· Seedling (0-10 yrs)	684	392	0	292	0	0
	· Sapling (11-20 yrs)	2003	684	684	684	684	684
	· Sawtimber (51+ yrs)	13,830	13438	13,830	13,538	13,830	13,830
	Non-Forested Cover Types						
	· Grass/Forb	252	252	252	252	252	252
	HABITAT COMPONENT	**Present Condition**	**ALT 1**	**ALT 2**	**ALT 3**	**ALT 4**	**ALT 5**
Thomas Run Sub-watershed	Forested Size Class						
	· Seedling (0-10 yrs)	0	225	0	71	0	0
	· Sapling (11-20 yrs)	375	0	0	0	0	0
	· Sawtimber (51+ yrs)	2,476	2,251	2,476	2,405	2,476	2,476
	Non-Forested Cover Types						
	· Grass/Forb	83	83	83	83	83	83
	HABITAT COMPONENT	**Present Condition**	**ALT 1**	**ALT 2**	**ALT 3**	**ALT 4**	**ALT 5**
West Branch of Tionesta Creek Watershed	Forested Size Class						
	· Seedling (0-10 yrs)	92	519	0	163	9	0
	· Sapling (11-20 yrs)	268	92	92	92	92	92
	· Sawtimber (51+ yrs)	5,648	5,129	5,648	5,485	5,639	5,648
	Non-Forested Cover Types						
	· Grass/Forb	172	190	172	175	180	172

	HABITAT COMPONENT	Present Condition	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5
Buck Lick Sub-Watershed	Forested Size Class						
	· Seedling (0-10 yrs)	207	201	0	201	0	0
	· Sapling (11-20 yrs)	309	207	207	207	207	207
	· Sawtimber (51+ yrs)	3,399	3,198	3,399	3,198	3,399	3,399
	Non-Forested Cover Types						
	· Grass/Forb	23	23	23	23	23	23
	HABITAT COMPONENT	**Present Condition**	**ALT 1**	**ALT 2**	**ALT 3**	**ALT 4**	**ALT 5**
Kinzua Creek Watershed (upper)	Forested Size Class						
	· Seedling (0-10 yrs)	216	10	0	10	0	0
	· Sapling (11-20 yrs)	150	216	216	216	216	216
	· Sawtimber (51+ yrs)	4,230	4,220	4,230	4,220	4,230	4,230
	Non-Forested Cover Types						
	· Grass/Forb	342	342	342	342	342	342
	HABITAT COMPONENT	**Present Condition**	**ALT 1**	**ALT 2**	**ALT 3**	**ALT 4**	**ALT 5**
Kinzua Creek Watershed (middle)	Forested Size Class						
	· Seedling (0-10 yrs)	578	104	0	104	0	0
	· Sapling (11-20 yrs)	371	578	578	578	578	578
	· Sawtimber (51+ yrs)	6,979	6,875	6,979	6,875	6,979	6,979
	Non-Forested Cover Types						
	· Grass/Forb	303	303	303	303	303	303
	HABITAT COMPONENT	**Present Condition**	**ALT 1**	**ALT 2**	**ALT 3**	**ALT 4**	**ALT 5**
Tionesta Creek Watershed	Forested Size Class						
	· Seedling (0-10 yrs)	86	44	0	44	0	0
	· Sapling (11-20 yrs)	82	86	86	86	86	86
	· Sawtimber (51+ yrs)	2,399	2,355	2,399	2,355	2,399	2,399
	Non-Forested Cover Types						
	· Grass/Forb	63	63	63	63	63	63

Riparian/Specialized Habitat

Riparian and specialized habitats and their importance to wildlife are described under Affected Environment. The Forest Plan requires that preferential consideration be given to riparian dependent resources, including wildlife and fish (Forest Plan, p. 4-19). As discussed in the Ecological Landtype section, Physical Environment, computer mapping was utilized to help identify where the proposed activities lay in relation to areas that potentially contain riparian areas. Under Alternative 1 about 12 stands totaling 102 acres contain inclusions of riparian habitat. Alternatives 2, 3, and 4 contain 59, 65, and 66 acres with riparian inclusions. None of the timber harvest treatments or herbicide treatments would occur in areas with standing water and wetland plants or on the immediate stream bank. Timber sale administrators would monitor harvest operations to ensure that sensitive soils and riparian habitats are properly protected. As a result, there are no effects anticipated to any riparian habitat associated with perennial or intermittent streams. Habitats associated with depression ELTs, wetlands, seeps and springs, rock outcroppings and uncommon inclusions such as hemlock, den trees and snags, raptor nest sites and mast species are scattered and have been identified within each small watershed group and may occur in or near stands proposed for treatment. Many unique plant communities are associated with riparian areas

and wetlands, therefore, the mitigation measures listed in Appendix D will ensure unique plant communities associated with these areas will be protected under all alternatives.

Changes in Available Habitat for MIS

The following is a discussion of the expected changes in available habitat for management indicator species by alternative. For the purpose of this analysis, short-term changes are those that would occur within the next 20 years whereas long-term changes are those that go beyond 20 years. While many species will utilize a single forest or non-forest community, they may also have other specialized habitat requirements for feeding and/or reproduction. For example, grouse require openings for brood rearing in close proximity to regenerating forest, which is used for nesting and drumming. These will be discussed where these specialized habitats will be affected. Also some species appear more than once if they are an indicator of more than one habitat or specialized habitat feature. For example, the pileated woodpecker requires mature or late successional forest conditions for nesting. It also requires large cavity trees, so the possible effects on both of these habitats are displayed.

An evaluation of vegetation conditions and certain features has been completed on the 8,223 acres proposed for treatments. This data will be incorporated where applicable.

Early Successional Species

Due to increases in the amount and distribution of seedling sized trees, aspen regeneration and conifer planting scattered throughout the project area, habitat for early successional species such as grouse would be improved under Alternatives 1 and 3. Available habitat for early successional species such as grouse would remain the same under Alternatives 2, 4 and 5. Habitat for woodcock would be improved as a result of proposed release treatments under Alternatives 1, 3 and 4. This will result in the development of nesting cover in close proximity to singing and foraging areas. Under Alternatives 2 and 5, woodcock habitat would remain unchanged in the short term. In the long term, existing early successional habitats would develop into pole size stands and eventually into mature forests with no new early successional habitats being developed. Areas with dense fern would not develop tree seedlings and saplings resulting in a decline in the quality and quantity of early successional habitat. Most unfenced sites under Alternatives 2-4 are salvage/thin treatments, and there will be some short term (1-3 years) increases in available deer forage. Deer habitat would be reduced in the long-term under Alternatives 5, as present seedling-sized habitat matures.

The following information is based on data collected and analyzed on the 8,223 acres of East Side prescribed for treatment. Currently, there are 933 acres that have up to 30% density of regenerating understory. The largest decrease in this structure type would occur under Alternative 3 and would decrease to 498 acres.

Mature/Late Successional Forest Species (51 - 110 year age class)

Species utilizing this community would be affected most by the reduction in the amount of mature forest that would occur as a result of proposed timber harvest. Habitat for species requiring mature forest conditions would be reduced by 1% and <1% of the project area, under Alternatives 1 and 3. These sites would be accompanied by reforestation treatments that would improve the success of establishment of a new forest stand. Over the long term, this would provide the mosaic of forest successional stages to sustain a wide variety of wildlife over the long term. Alternatives 1 and 3 would result in a minor reduction in habitat for the pileated woodpecker, red-shouldered hawk and great blue heron. This

reduction in habitat may also result in increased competition and predation in and around areas of regeneration cutting. However, this would be expected to be a short-term effect since the openings created through regeneration cutting and disturbance associated with logging are temporary in nature.

Under Alternatives 2 and 5, without reforestation activities it is likely that no new tree seedlings would develop over large areas specifically where there is dense fern, grass or stripe maple. Overstory trees would continue to die over time with no replacement. Mature forest conditions would not be sustainable over the long term and habitat quality and quantity would decline for red-shouldered hawks, pileated woodpeckers, and great blue herons.

Regeneration cutting and wildlife habitat improvement might increase the prey base for the timber rattlesnake on a localized scale. However, there are only five potential rattlesnake dens in the project area and a change in habitat availability for this species would not be expected under any alternative.

From the 8,223-acre data set, there is currently 7,920 acres of 51 - 110 year vegetation. Under Alternative 1 this age class will decrease to 4,370 acres; 6,355 acres under Alternative 2; 4,896 acres under Alternative 3; 6,346 acres under Alternative 4; and will remain the same under Alternative 5.

Mature Mixed Conifer Species

Available habitat for species that are strongly associated with a mature mixed conifer and deciduous component (black-throated green warbler and hermit thrush) would be improved slightly in the long term under Alternatives 1, 3 and 4, due to proposed conifer underplanting and conifer release, with the greatest increase occurring under Alternative 1. Increases in temporary edges created under Alternatives 1, 3 and 4 would also result in a more immediate or short-term increase in habitat availability for species such as the hermit thrush, which nest in mature forest near clearings and/or temporary edges created by regeneration cutting. Barred owl habitat would not be expected to change under any alternative, since preferred nesting habitat would not be affected, and this species will continue to forage near regeneration cuts. Although barred owl can be displaced through competition by the great horned owl in areas interspersed with agriculture or in highly fragmented landscapes (Brauning 1992), based on the fragmentation analysis presented and the abundance of forested landscapes of the project area, displacement of the barred owl through increased competition is not expected to occur.

The conifer component listed in Table 82 and Table 83 are those stands with a conifer component of 50% and greater. Mixed mature conifer/hardwood stands below 50% exists within the project area and the 8,223 acres of project units. Currently, 621 acres of mature conifer exists within the mature hardwood stands. This will increase by 28 acres under Alternatives 1 through 5 as these acres move into the 51-110 year age class. All treatments proposed in these stands will retain existing overstory conifer and possibly improve the understory conifer component. As a result, no harvest treatments are proposed that would adversely affect this community.

Species Requiring Regenerating Conifer

Conifer underplanting and release proposed under Alternatives 1, 3 and 4 would improve the understory conifer component on the project area. This is expected to increase available habitat for species requiring understory conifer such as the magnolia warbler on a localized basis. Additionally, mitigation measures call for the retention of conifer in all harvest units and understory or midstory conifer will not be reduced as a result of proposed timber harvest under Alternatives 1 through 4. Habitat for magnolia warbler is expected to remain relatively unchanged under Alternatives 2 and 5.

Cavity-Nesting Species

Since mitigation measures call for the retention of snags during harvesting and more snags and cavity trees would be recruited over time, the amount and availability of snags and availability of habitat for cavity-nesting species is not expected to change under any alternative.

Species Preferring Aspen

There are 92 acres of aspen regeneration cutting proposed under Alternatives 1, 3 and 4 which will provide stands of regenerating aspen. Remaining mature aspen is being retained in order to provide a mature aspen component. The project area presently provides many sites for beaver habitat and this is not expected to decrease under any alternative.

Upper, Intermediate Canopy (3-20 ft) and Ground Nesting Species

A maximum of 2% of the project area would be affected by proposed uneven-age or even-age regeneration cutting. Proposed regeneration cutting and site preparation will affect habitat for species that feed and nest in the forest canopy (black-throated green warbler), as well as mature forest species that utilize the intermediate canopy. Habitat for these species would be reduced in the short and long term in the project area under Alternatives 1 through 4. Of the 8,223 acres prescribed for treatment, there is currently 8,100 acres of mature forest providing overstory canopy. The reduction under each alternative is discussed under the mature forest section. Intermediate canopy is available on 2,685 acres. This is expected to increase to 7,792 acres under Alternative 1; 7,890 acres under Alternatives 2 and 5; 7,756 acres under Alternative 3; and 7,950 acres under Alternative 4.

Ground nesting species may also be affected in the short term, but monitoring data on the ANF suggests that some ground nesting species will continue to utilize skid trails in regenerating stands and in stands where grass and fern do not exceed 80% of the area. Of the 8,223 acres, 4,480 acres currently have fern and grass cover below 80%. Under Alternative 1 this will increase to 4,979 acres; 4,819 under Alternative 3; 122 acres under Alternative 4; and decrease to 2,654 acres under Alternative 2. Fern and grass may increase with no treatment under Alternative 5.

Aquatic Species

Species could be affected if potentially suitable habitat, including wetlands or riparian areas, were disturbed or altered. Forest Plan direction requires that preferential consideration be given to riparian resources including spring seeps and wetlands (Forest Plan, p. 4-19 to 4-29, 4-31, USDA-FS 1986a, USDA-FS 1997b). This was a consideration during the planning and layout of activities in the East Side project area, and as a result, there were no treatments proposed within riparian areas or over wetlands that would directly affect these species. Additionally, a fisheries amendment was completed in 1997 that provides guidelines to reduce sedimentation and benefit species that are affected by water quality conditions, sedimentation and disturbance of the stream channel and streamside vegetation (USDA-FS 1997b). The ANF is meeting the Pennsylvania Department of Environmental Protection water quality standards based on several monitoring studies conducted on the ANF. These studies are summarized on pg. 50-54 of the Biological Assessment (USDA-FS 1998b). Forest Plan standards and guidelines

presently meet or exceed Pennsylvania's Best Management Practices for addressing the control on non-point source pollution (sedimentation) (USDA-FS 1997b).

Nine acres of fish and stream improvement work has been proposed for Alternatives 1, 3 and 4. The mitigations listed in Appendix D will continue to reduce sedimentation and erosion. No mitigations or corrections on roads would be implemented under Alternative 5, thus allowing current sedimentation problems to continue.

Effects on Unique Plant Communities

Unique plant communities were identified during field reconnaissance specifically in upland depression ELTs. These areas also display wet soil conditions and will be avoided during project implementation. Additionally, sites identified in the ANF Plant Model will be monitored to validate the model, as well as to identify unique plant communities. The majority of unique plant communities identified by the model occur in floodplains or upland depressions. These areas will be protected by the mitigations currently in affect for riparian zones and wetlands. If an area did not occur in a riparian site, it was surveyed and appropriate guidelines have been made to ensure the sustainability of these ecosystems. For these reasons, there are no significant effects anticipated to unique or sensitive plants under any alternative.

Fragmentation

For the purpose of this analysis, fragmentation was measured using: 1.) the presence and quantity of different habitat types, 2.) habitat position or isolation, 3.) the presence and location of unique features such as large trees, unusual plant communities or large boulders and 4.) the location of corridors of a natural or semi-natural matrix. Using the existing description of landscape patterns in each small watershed, the action alternatives were mapped and overlaid with the existing conditions to determine the effects of treatments on these patterns. The units considered that will create temporary openings include clearcuts, delayed harvest salvage clearcuts, shelterwood removals and shelterwood seed cuts.

Under Alternatives 1 and 3, there are 2 units of overstory removal and 7 units of shelterwood seed cuts prescribed in Salmon Creek Sub-watershed with all units located on the east side of the watershed. The majority of the watershed will not be directly affected. Two units are adjacent to 0-10 year old stands and a permanent opening. This will provide 3 age classes of vegetation and enhance habitat for ruffed grouse and other species that utilize these habitat components. Mature forest habitat will be reduced but no patches will be isolated and travel corridors will be retained. The conifer component and riparian zones will not be disturbed. No final harvests or shelterwood seed cuts are proposed under Alternatives 2, 4 and 5.

Under Alternatives 1 and 3, there are 5 units of shelterwood seed cuts prescribed in The Branch Sub-watershed. The existing mature forest patch is not large but is contiguous and interspersed with various age classes. The mature forest will be reduced but no isolation of forest community will occur, and travel corridors will remain available for dispersal. No final harvests or shelterwood seed cuts are proposed under Alternatives 2, 4 and 5.

Under Alternative 1, there are 11 units of overstory removal, 10 units of shelterwood seed cuts and 4 units of delayed harvest prescribed within the Spring Creek Watershed. The majority of this activity is proposed to occur in the west portion of the watershed. In general, units have been placed adjacent to stands of varying age classes such as openings, 0-10, 11-20 and 21-50. No riparian areas, mature conifer or oak stands will be affected. Mature forest will be reduced but no isolation will occur and corridors will

remain. Under Alternative 3, 6 units of overstory removal and 9 units of shelterwood seed cuts are proposed. Effects remain the same as under Alternative 1. No final harvests or shelterwood seed cuts are proposed under Alternatives 2, 4 and 5.

Under Alternatives 1 and 3, there are 38 units of shelterwood seed cuts, 6 overstory removals and 9 units of delayed harvest prescribed within the Bear Creek Watershed. The majority of this activity would occur in the northeast and southeast portion of the watershed. One stream corridor of Pine Run along Forest Road 297 would become narrower but not restricted. No isolation would occur. No final harvests or shelterwood seed cuts are proposed under Alternatives 2, 4 and 5.

Under Alternatives 1 and 3, 10 units of shelterwood seed, 4 overstory removals and 4 units of delayed harvest prescribed within the South Branch Tionesta Creek Watershed. Units have been placed to provide a complex of age classes and still retain corridors of mature forest. There is 1 small patch of mature forest that will be isolated because it will be surrounded by a younger age class. This unit lies adjacent to Forest Road 195.2. No final harvests or shelterwood seed cuts are proposed under Alternatives 2, 4 and 5.

Under Alternative 1, 14 units of shelterwood seed, no overstory removals and 6 units of delayed harvest prescribed within the Thomas Run Sub-watershed. The units are scattered across the sub-watershed and though forest patch size will be reduced, no isolation will be created and corridors will remain available for dispersal. Under Alternative 3, 6 units of shelterwood seed cuts are prescribed. This reduces the amount of forest habitat that will be changed to temporary opening; all other affects remain the same. No final harvests or shelterwood seed cuts are proposed under Alternatives 2, 4 and 5.

Under Alternative 1, 17 units of shelterwood seed cuts are prescribed within the West Branch of Tionesta Creek Watershed. If these actions are implemented large patches of mature forest will remain including 4 large patches of mature conifer. No isolation will occur and corridors will remain available. Under Alternative 3, 4 units of shelterwood seed cuts and 1 overstory removal are prescribed. This will result in a decrease of forest patch size; all other affects remain the same. No final harvests or shelterwood seed cuts are proposed under Alternatives 2, 4 and 5.

Under Alternatives 1 and 3, 4 units of shelterwood seed and 1 unit of delayed harvest are prescribed within the Bucklick Sub-watershed, one unit is within a 111+ year old stand which will reduce the amount of this community type. Mature forest patches will also be reduced, no isolation will occur and corridors will remain available for travel and dispersal. There is a significant presence and distribution of mature conifer specifically along Sugar Run and Bucklick Run with very few openings. These and the riparian zones will remain undisturbed. No final harvests or shelterwood seed cuts are proposed under Alternatives 2, 4 and 5.

Under Alternative 1, 5 units of shelterwood seed are prescribed within the Kinzua Creek Watershed (upper). This would create a slight decrease of mature forest patches, but continuous mature forest with a mature oak and mature conifer component would remain the dominant community type. No isolation should occur and corridors would continue to be provided. Under Alternative 3, 1 unit of shelterwood seed cut is prescribed; effects remain the same but less forested community would become temporary opening. No final harvests or shelterwood seed cuts are proposed under Alternatives 2, 4 and 5.

Under Alternatives 1 and 3, 2 units of shelterwood seed cuts are prescribed within the Kinzua Creek Watershed (middle). This would minimally reduce the amount of mature forest patch size. No isolation will occur and corridors will remain. No final harvests or shelterwood seed cuts are proposed under Alternatives 2, 4 and 5.

Under Alternatives 1 and 3, 5 units of overstory removal cuts are prescribed within the Tionesta Creek Watershed. They are located adjacent to openings, 0-10, 11-20, 51+ and 111+ year vegetation. This provides a complex of vegetation diversity and optimal habitat for species that utilize these habitats. None of the Tionesta Scenic and Natural Resource Area is affected, no mature forest patches will be isolated and corridors will remain available. No final harvests or shelterwood seed cuts are proposed under Alternatives 2, 4 and 5.

All four-action alternatives would result in a decrease of forest patch size. Alternative 1 would result in the largest increase in fragmentation of habitat, in the short term, due to the amount of removal cutting proposed. Alternative 5 would maintain the present amount of interior habitat in the short term. In the long term, small shifts in the distribution of some species may occur but quality habitat for all current species would remain intact under Alternatives 1, 3, and 4 where reforestation treatments would allow a new forested stand to develop. Under Alternatives 2 and 5 areas devoid of mature trees would persist for long periods of time since tree seedlings would not easily become established to provide a new forest.

Compared to the last 10 years, temporary openings created by regeneration cutting would increase under Alternatives 1 and 3, and would decrease under Alternatives 2, 4, and 5. While harvesting reduces the mature canopy block size, it does not result in a permanent brushy edge that supports a distinct edge community (DeGraaf et al 1992). For this reason, any openings created through proposed timber harvests would be considered temporary in nature and would not be expected to result in significant increases in nest predation and brood parasitism.

Although roads and rights-of-way less than 300 feet in width are not considered wide enough to fragment the forest and create edge conditions that would impact interior birds (USDA Biodiversity 1993), narrow roads may affect movement of some small mammals and amphibians. Considering the disturbance associated with new road construction, betterment, and realignment a total of 67.9 acres would be cleared under Alternative 1. Under Alternatives 2 and 4 the acreage cleared for all road activities totals 37.5 acres and 40.7 acres respectively. No road construction would occur under Alternatives 3 and 5. Road construction would not cause major fragmentation of habitat under any alternative because the disturbance is so small and large blocks of forest habitat would remain intact.

Cumulative Effects

The direct and indirect effects of activities on wildlife that are expected to occur within the watershed and include an analysis of National Forest System lands, as well as a discussion of the effects of timber harvest that have occurred for the last 20 years (current conditions) are addressed in the preceding pages. Cumulative effects related to wildlife are evaluated by looking at past, present and foreseeable future effects that are most likely to result in a change in wildlife habitat conditions and wildlife distribution and use within the project area. When considering effects to wildlife over time, the primary factors of change affecting the East Side project area and surrounding landscapes include timber harvest and oil and gas development.

Effects in Table 87 and Table 88 include past, present and foreseeable future timber and OGM that will occur under all alternatives. The cumulative effects on wildlife habitat conditions displayed in Table 88 are evaluated by using three points of reference including 1986 - 1999, future forest service activities to 2019 and activities proposed in East Side under each alternative. The future activities on private land were considered for effects related to oil and gas development. This not only summarizes cumulative effects through the year 2019, but also helps to display trends in management activities and the resultant rate of change in wildlife habitat conditions over three decades.

An estimated 687 acres of past final harvest on private land can be applied to all alternatives for each decade. This acreage was not incorporated into calculations to determine acreage in each community age class for existing conditions. Approximately 1,374 acres of final harvest on private land will be added to East Side treatments to determine the first decade size classes. Using information presented in Table 87 and Table 88, the following is a discussion of the cumulative effects of even-aged timber harvest and oil and gas development on wildlife within the East Side project area.

Oil and Gas Development

The location and extent of oil and gas related effects are discussed under the OGM Section. Potential effects of this development on wildlife will be related to increased levels of fragmentation and the physical disturbance associated with this type of intensive development. It is well documented that open roads and increased human activity will result in decreased wildlife use of an area such as nesting turkeys, denning black bears, and bobcats raising their young. As a result, oil and gas development is expected to affect wildlife use on approximately 3,558 acres. Potential effects of intensive oil and gas development on wildlife have been monitored on the ANF for the last five years, and two breeding bird transects have been established to document changes in the bird community in areas affected by intensive oil and gas development. This data indicates that as long as the area maintains a predominantly mature overstory, a full complement of breeding birds, including interior species can be expected to be present. Also, it has been observed that species such as turkey and bear frequently use these areas for brood rearing because berries are often associated with these small openings. This indicates that while this level of oil and gas development may reduce the suitability of the area for some species, it does not make habitat unsuitable. Finally, a large majority of the project area will continue to be unaffected by intensive oil and gas activity and will provide suitable habitat, if not optimum habitat conditions for potentially affected species. Based on breeding bird monitoring, field observations of potentially affected species and the availability of habitat unaffected by oil and gas activity, wildlife related effects associated with the physical disturbance of past, present and anticipated future level of oil and gas activity are not expected to be significant.

Table 87. Summary of Cumulative Effects Related to Oil and Gas Development

				CUMULATIVE ACTIVITY SUMMARY (roads, well sites, disturbed areas, pits)									
Activity	**Past & Present**	**Future FS**	**Future Private**	**Alt 1**	**Alt 1 CE**	**Alt 2**	**Alt 2 CE**	**Alt 3**	**Alt 3 CE**	**Alt 4**	**Alt 4 CE**	**Alt 5**	**Alt 5 CE**
OGM Development	1983-1997												
· Roads	911.9	0.3	41.25	15.8	969.25	8.3	961.75	0	953.45	9.97	963.42	0	953.45
· Well Sites	3519	0	165	0	3684	0	3684	0	3684	0	3684	0	3684
· OGM Disturbed Area	3502.9	0	54.75	0	3557.65	0	3557.65	0	3557.65	0	3557.65	0	3557.65
· Pits	196	0	3	7	206	5	204	4	203	7	206	0	199

Table 88. Changes in Wildlife Habitat Conditions Due to Timber Harvest Treatments

			TREATMENT BY ALTERNATIVES									
	PRESENT		**ALT 1**		**ALT 2**		**ALT 3**		**ALT 4**		**ALT 5**	
ACTIVITY	**acres**	**% of area**	**Acres[1]**	**Alt 1 CE[2]**	**Acres[1]**	**Alt 2 CE[2]**	**Acres[1]**	**Alt 3 CE[2]**	**Acres[1]**	**Alt 4 CE[2]**	**Acres[1]**	**Alt 5 CE[2]**
Acres Forested Habitats												
· Seedling	7,275	5	1366	15,250	0	13,499	1045	14,800	9	13,508	0	13,499
· Sapling	8,656	6	7275	1366	7275	0	7275	1045	7275	9	7275	0
· Pole	8,619	6	8656	7275	8656	7275	8656	7275	8656	7275	8656	7275
· Mature Forest[3]	110,506	79	117,759	111,165	119,125	114,282	118,080	111,936	119,116	114,264	119,125	114,282
Non-Forested Habitats												
· Grass/forb	3,160	2	3,186	3206	3,160	3160	3165	3,170	3,170	3180	3,160	3,160
· Tall forbs/ shrub/ orchard	568	<1	1,034	1,434	568	568	1034	1434	1034	1434	568	568

1. *changes in vegetation size class expected to occur within the next 10 years. Activities that were used to calculate the seedling acres are: East Side even-aged final harvest (clearcuts, shelterwood removals, delayed shelterwood removals), two-age prep and two-age cut.*
2. *changes in vegetation size class expected to occur within the 10 to 20 year period. Activities that were used to calculate the seedling acres are: East Side 0-10 age class, future forest service even-aged final harvest, future private land final harvest, two-age prep and two-age cut.*
3. *mature forest acres were calculated for East Side alternatives and cumulative effects alternatives using pole size acres plus mature forest acres minus seedlings acres.*

Timber Harvest

Table 88 displays vegetation age classes that are created by timber harvest that has occurred on the East Side project area for the last 14 years, as well as age classes that will develop from proposed East Side projects and anticipated management in the foreseeable future, or through the year 2019. The Cumulative Effects Analysis related to even-aged management spans a period of approximately 33 years (1986-2019).

Approximately 35% of the treatments from 1986 to the present involved thinnings and shelterwood seed cuts (intermediate treatments) where one-third of the trees were removed and a mature overstory was retained following harvest. Direct effects to wildlife from these types of treatments are generally short-term in nature and could involve some direct mortality if cutting occurred during the breeding season and avoidance by some species during logging. Conversely, some species are attracted to logging, due to the short-term increase in browse and cover provided by increased levels of slash. While this type of harvest maintains a mature overstory, it does alter stand structure and understory conditions by removing small diameter trees and by increasing light levels to the forest floor. This results in an increase in the establishment of woody (trees & shrubs) and herbaceous (grass/forbs/fern) vegetation. Potential effects to wildlife from intermediate treatments have been evaluated by monitoring amphibians, small mammals and birds on 35 sites across the ANF. Based on the level of harvest proposed, this data indicates that the diversity of wildlife would not change significantly under any of the alternatives in the East Side project area.

Effects of regeneration harvest on wildlife habitat differ from the intermediate treatments described above in that most of the mature overstory is removed. While partial treatments result in relatively minor changes in wildlife distribution and use, regeneration cutting results in a more dramatic change in wildlife habitat and it may take up to 50 years for some species to reoccupy the site, although most species would be expected to reoccupy the site in the first 15-20 years. While regeneration harvest eliminates or reduces habitat for some mature forest wildlife, it also creates habitat for early successional species, as well as a large number of mature forest wildlife that also utilize early successional habitat. Forested habitats identified in Table 88, display the amount and rate of change over time of past, present and anticipated vegetation communities based on age class. When evaluating cumulative effects, several factors are important. The level of regeneration harvest or available seedling/sapling forest is only one consideration. Equally important is the amount of unaffected mature forest habitat and rate of change over the analysis period. A maximum of 15,250 acres or 11% of the East Side project area will be affected by regeneration harvest during the analysis period (present-2019). Mature forest habitat will be maintained on over 79% of the area under all alternatives and available mature forest will be well distributed and interconnected across the project area. Finally, forest-wide wildlife monitoring of sites affected by this level of regeneration harvest indicates the amphibian, small mammal and bird communities would not be significantly affected (Dave deCalesta, pers. comm.). Based on the level of past and proposed harvest, there are no significant cumulative effects to the wildlife resource anticipated under Alternatives 1, 3, and 4. However under Alternatives 2 and 5 reforestation treatments would not occur on areas where significant tree mortality has occurred and where understory conditions will not allow new tree seedlings to become established. Under these the long-term result could be large areas with few (if any) live overstory trees and create a decline in quality and quantity of mature forest habitat.

There are 28,195 acres of private land within the East Side project boundary. Of this 16,982 acres are typed as forested and 11,213 acres are typed as non-forested, which includes agriculture, residential, water, 0-20 year vegetation and oil and gas areas. Non-forested habitat on private lands would not change appreciably under any alternative. Anticipated oil and gas development would increase non-forested habitat under all alternatives by an estimated 55 acres. Private land composition and structure will be considered as an influence to communities within the project area.

Genetic Diversity

The distribution of genetic diversity depends on population size, gene flow and the mode and intensity of natural selection (Allendorf et al, 1983). Habitat fragmentation has the potential to subdivide a single large population into sub-populations and genetic diversity can suffer if the linkages of dispersing individuals between subpopulations are totally or partially disrupted. The distance at which populations become disjunctive from one another depends upon the individual species' biology. For example, wind pollinated plants may have greater dispersal distances for pollen than insect-pollinated plants, and winged or tufted seeds will disperse much further than heavy seeds. Also less mobile wildlife species (e.g. salamanders) are more likely to be affected than highly mobile species (e.g. black bear). Thus, habitat fragmentation has the potential to indirectly affect genetic diversity by influencing both the population size and gene flow as a consequence of decreasing patch size and increasing patch insularity, respectively. Based on the fragmentation analysis presented, particularly: 1.) the interconnectiveness of available habitats, 2.) the connectiveness of similar habitats surrounding affected areas, 3.) protection of all unique, rare or uncommon habitats, and 4.) the small distances across the affected stands, there are no significant impacts anticipated under any alternative that would isolate sub-populations or alter gene flow of existing populations.

Fragmentation

Potentially significant cumulative effects were identified by looking at the predominant human-caused disturbances that have occurred within the watersheds over time and the potential for disturbance in the future. For the purpose of this analysis, the geographic scope or cumulative effects analysis boundary used to evaluate effects to the wildlife resource includes all private and National Forest System lands within the entire East Side project area. While expansion of the cumulative effects boundary will pick up additional areas of comparable timber harvest and oil and gas development, it will also pick up large areas where there has been little activity in the last decade, which will tend to dilute the effects of these activities.

Fragmentation is one of the potential effects of both timber harvest and oil and gas development. As additional projects are analyzed, the placement and distribution of temporary openings will be chosen as to maintain natural corridors between similar communities and to avoid isolation. Road Construction will be done at the lowest level (level D) and some roads may be closed or restricted. The placement will also consider the existing condition of private lands and an estimate of future management or use of the private land. Although some forested patches will be reduced, this community type dominates the landscape of the project area. Finally, the interconnectiveness of forested habitat, which also affects fragmentation within the East Side project area, is characteristic and typical of the surrounding landscape.

Based on the cumulative effects analysis presented above, as well as the effects of fragmentation, Alternatives 1, 3, and 4 are not expected to result in significant effects from fragmentation. With no efforts to re-forest areas where most of the trees have died under Alternatives 2 and 5, large areas devoid of most live trees would develop across the landscape. These areas devoid of forest would fragment wildlife habitat. Specific impacts to specific species would depend on the size and distribution of these non-forested areas across the landscape.

Threatened, Endangered, and Sensitive Species

The Biological Assessment (BA) in Appendix C addresses effects on threatened, endangered, and sensitive species in detail. Most species would not be adversely affected by the actions proposed under all of the alternatives. A few species such as the rattlesnake and northern long-eared bat could have impacts to individuals but would not likely cause a trend toward federal listing. A long-term cumulative impact could occur to the endangered Indiana bat under Alternatives 2 and 5. No reforestation treatments under these two alternatives would create large areas with few live trees across the landscapes. The quality and quantity of Indiana bat habitat would be diminished.

Summary of Determinations

Based on the analysis provided in the BA, including implementation of mitigation measures, the following determinations were made for each of the species.

Timber rattlesnake - Alternatives 1-4 - May impact individuals but not likely to cause a trend toward federal listing. Alternative 5 - no adverse impact.

Bald eagle - Alternatives 1-5 - No adverse effects beyond those set forth in the Biological Opinion (USDI-FWS 1999).

Yellow-bellied flycatcher - No adverse impact under any alternative.

Indiana bat - Alternatives 1, 3, and 4 - no adverse effects beyond those set forth in the Biological Opinion (USDI-FWS 1999). Alternatives 2 and 5 - may affect due to long term loss of optimal canopy conditions

Northern long-eared bat - Alternatives 1, 3, and 4 - no adverse impact. Alternatives 2 and 5 - may impact individuals and colonies due to loss of optimal canopy conditions, but would not cause a trend toward federal listing.

Northern water shew - Alternatives 1 through 4 - May impact individuals but not likely to cause a trend toward federal listing. Alternative 5 - no adverse impact.

Clubshell mussel - no adverse affect under any alternative

Northern riffleshell mussel - no adverse affect under any alternative

Green faced clubtail - no adverse impact under any alternative

Long-solid mussel - no adverse impact under any alternative

Harpoon clubtail - no adverse impact under any alternative

Rapids clubtail - no adverse impact under any alternative

Mustached clubtail - no adverse impact under any alternative

Midland clubtail - no adverse impact under any alternative

Ski-tailed emerald - no adverse impact under any alternative

Uhler's sundragon - no adverse impact under any alternative

Maine snaketail - no adverse impact under any alternative

Zebra clubtail - no adverse impact under any alternative

Small whorled pogonia - no adverse affect under any alternative

Wiegand's sedge - no adverse impact under any alternative

Butternut - no adverse impact under any alternative

Creeping snowberry - no adverse impact under any alternative

Thread rush - no adverse impact under any alternative

Rough cotton-grass - no adverse impact under any alternative

Spotted darter - no adverse impact under any alternative

Tippecanoe darter - no adverse impact under any alternative

Longhead darter - no adverse impact under any alternative

Mountain brook lamprey - no adverse impact under any alternative

Gravel chub - no adverse impact under any alternative

Channel darter - no adverse impact under any alternative

Gilt darter - no adverse impact under any alternative

Summary of Mitigation Measures and Effectiveness

Site-specific mitigations for individual stands can be found in Appendix D. Such measures are designed to protect/enhance rock outcroppings or boulder fields; ensure stabilization of landings and skid trails; retain all shagbark and shellback hickories; retain leave clumps; restrict the season of operation for some activities; protect spring seeps and water areas; retain adequate amount of snags and den trees; and buffer stick nests.

We have been implementing many of these mitigation measures for over a decade and have monitored their effectiveness during and after implementation. Based on experience and monitoring, these mitigation measures have proven effective at reducing or eliminating impacts to the intended resource. The ANF is meeting the Pennsylvania Department of Environmental Protection's water quality standards based on several monitoring studies conducted on the ANF. These studies are summarized on pages 50-51 of the BA for threatened and endangered species (USDA-FS 1998b). Forest Plan standards and guidelines presently meet or exceed Pennsylvania's Best Management Practices for addressing the control of non-point source pollution (sedimentation). (USDA-FS 1997b)

With implementation of the mitigation measures, there are no adverse effects anticipated to any rare, unique or sensitive habitats such as riparian areas, forested or non-forested wetlands, spring seeps, or areas of rock outcroppings. As a result, these habitats would be protected and wildlife that utilize these communities are not expected to be adversely affected with the implementation of any alternative.

SOCIO-ECONOMIC ENVIRONMENT

Heritage Resources

Affected Environment

The East Side project area contains a wide variety of heritage resources, both prehistoric and historic, representing thousands of years of human use of the area. For thousands of years, humans living in what is now the Allegheny National Forest have adapted to changing ecosystems by adjusting their settlement-subsistence systems and cultural adaptations through time in response to environmental changes. Not only did they respond to environmental change but in some cases were either directly or indirectly responsible for the changes.

Prehistoric Heritage Resource Sites

Prehistoric sites discovered include rockshelter sites, open-air campsites, village sites, and burial mounds. Although most researchers discuss human occupation of the western hemisphere beginning with the Paleo-Indian period, there is a growing body of widely scattered evidence that seems to suggest that there may have been people in North America preceding the Paleo-Indian Period (Adovasio et. al. 1977). Evidence of this is sketchy at best, consisting for the most part of crude tools, with some extinct fauna in scattered parts of the country. The best-documented dates for early occupation in North America are based on over 40 radiocarbon dates ranging from 14,000 to 17,000 B.P. (ca. 12,000 -15,000 B.C.) from the Meadowcroft Rockshelter in southwestern Pennsylvania (Boldurian and Adovasio 1986). The unglaciated Alleghenies within the ANF with their dry rockshelters and Pleistocene terraces have the greatest potential for yielding evidence of sites of this antiquity; yet investigations of this area have yet to yield any convincing evidence of this period.

With the exception of two sites, archaeological evidence for the **Paleo-Indian period (12,000 - 8,000 B.C.)** in Pennsylvania consists mainly of scattered surface finds of fluted points. The Paleo-Indian occupation of the ANF occurred during the latter stages of the Wisconsin glaciation, at about 9,000 B.C. The environment of this period reflected the proximity of the retreating ice mass that was located north of the St. Lawrence Valley. Miller (1973) defines this period on the basis of pollen samples from the Allenburg Bog, since the rapid advance of the early tundra vegetation was closely followed by an open spruce boreal woodland. The dispersal of early migrants through this region was dictated to a large extent by the residual effects of glaciers. Valleys of Brokenstraw Creek, the Allegheny River, and Conewango Creek provided a natural route of transportation that Lantz (1984; 1985) has coined "the Paleo-Indian Corridor." The northern part of the project area embraces part of the Kinzua Creek drainage that flows north into the Allegheny River. Several miles to the north of its former confluence and upstream along the Allegheny River were several important Paleo-Indian sites along this "Paleo-Indian Corridor." These sites are now under water as a result of the construction of Kinzua Dam and the Allegheny Reservoir.

Although no confirmed Paleo-Indian sites were identified within the East Side project areas, likelihood exists that elsewhere within the general area encompassing the East Side EIS area some landforms not in areas of potential effect may contain archaeological evidence of this period. No ground disturbing activities are proposed for these areas.

Following the Paleo-Indian period, archaeologists have defined the **Archaic period (ca. 8,000 B.C. - 500 B.C.)** to denote a culture based on hunting, fishing, and gathering of wild vegetable foods, and lacking pottery, the smoking pipe, and agriculture (Ritchie 1980:31). The Archaic period is generally divided into Early, Middle, and Late sub-stages based principally on differences in artifact styles and assemblages.

Not much is known about the Early and Middle Archaic Periods in this area. The climate during the Middle Archaic Period is thought to have been hotter and drier. The onset of warmer climatic conditions brought with it a migration of plants and animals associated with essentially modern climate. Although scattered finds of diagnostic artifacts associated with the Early and Middle Archaic have been recorded on the ANF, none have been found within the East Side project area. Some landforms within East Side may have the potential for deeply buried archaeological deposits associated with Early and Middle Archaic cultures, but no ground disturbing activities are planned under any of the alternatives for these areas.

The **Late Archaic period** on the ANF and in northwestern Pennsylvania is associated with the maximum spread of the Oak-Hickory forest association across much of the Unglaciated and Glaciated Allegheny Plateau. Although the Oak-Hickory association never dominated the Unglaciated Plateau on the ANF, it spread extensively up many runs and streams that had previously been dominated by hemlock and beech. The Hemlock-Beech association remained dominant on the slopes and plateaus throughout the rest of prehistory and into early historic times until much of it was logged off in the late nineteenth and early twentieth centuries. Occurring with the spread of the Oak-Hickory forest association is an increase in the human population density of northwestern Pennsylvania and in the ANF along the Allegheny River and its major tributaries. Extensive groves of harvestable nuts (acorns and hickory nuts) were available for exploitation by both deer and humans. It is postulated that Late Archaic peoples depended upon deer and nut harvests although they also utilized a variety of other floral resources in a seasonal cycle of food resource procurement. The appearance of ground stone tools and heavy-duty woodworking tools of the Late Archaic, Transitional and Early Woodland Periods (ca. 4,000 B.C. - A.D. 1), along with the presence of nut hull fragments in archaeological features at base camp sites of these time periods, suggests that prehistoric human manipulation of the forested landscape was a part of settlement-subsistence systems (Munson 1986; DeVivo 1990; Adovasio et. al. 1977; Delcourt and Delcourt 1997; and Ruffner et. al. 1997).

Although a number of Late Archaic sites have been identified and inventoried within the general area of the East Side project only a few sites of this period are located in or near the proposed project areas. All sites of this period will be protected.

During the **Woodland period (ca. 500 B.C. - A.D. 1650)**, horticulture became increasingly prominent within the settlement-subsistence systems among the cultural groups in the Eastern Woodlands (Cowin 1985). By about A.D. 135, horticulture was being extensively practiced by the Iroquois Confederacy to the north (Snow 1994). The Iroquois, in order to create open areas, cleared and burned the forests (Parker 1968). Cultigens including sunflowers (Helianthus annus), maize (Zea mays), squash (Curcubita spp.), and beans (Phaseolus vulgaris) were cultivated in cleared fields extending out from a central village (Snow 1994). Cultigens helped reduce the dependence on hunting and gathering and allowed for the development of a more sedentary existence as evidenced by the presence of large village sites (Cowin 1985; Snow 1994; Ruffner et. al. 1997). Most occupation sites were located on river or glacial outwash terraces (Ritchie and Funk 1973; Snow 1994; and Lantz 1982). The availability of arable land was no doubt a major consideration for site location, due to requirements of a horticultural economy (Aldenderfer and Dean 1981).

After a decade or so, villages would be moved because of depletion of soil and wood (Ritchie and Funk 1973; Snow 1994). Late Woodland villages in the area characteristically tend to be protected with a wooden palisade (Ritchie and Funk 1973; Snow 1994; and Lantz 1982). Construction and occupation of village sites would, therefore, have required the inhabitants to use and consume a considerable amount of timber and fuelwood (Ruffner et. al. 1997). Thus, the anthropogenic landscape in the Allegheny River Valley and its major tributaries during the Late Woodland period would have resembled a mosaic pattern of 1) crop lands near palisaded settlements, 2) abandoned clearings with early successional taxa, and 3) open forest stands dominated by fire-adapted species such as oak and hickory (Delcourt 1987; Ruffner et. al. 1997).

Beginning in the Middle Woodland and continuing throughout the Late Woodland period the Oak-Hickory forest along smaller runs and streams on the plateau is gradually replaced by an Oak-Hemlock assemblage which led to a reduction of the deer population in and around the ANF. This, in turn, suggests that the uplands may have been lightly utilized during the Middle Woodland period (Aldenderfer and Dean 1981). However, given the increased population density during the Late Woodland period when larger villages became common and when numerous campsites of the period were scattered throughout the forest, it is likely that much of the ANF was utilized by hunters and collectors who supplemented the maize diet with other resources. With an increased population density, even relatively poor environments, such as the uplands around intermittent streams, would have been exploited for game and other resources (Aldenderfer and Dean 1981).

The closest major Woodland village sites to the East Side project are located to the north of the project area and have been long been inundated as a result of the construction of Kinzua Dam and the Allegheny Reservoir. Several small, fortified village sites are located in the uplands and within the general area of the East Side project; however, none of these sites are located in the vicinity of any of the proposed areas. Several other Woodland sites including campsites and one burial mound are located in the project areas. The proposed project for all alternatives has been designed to protect each of these sites through avoidance.

Historic Heritage Resource Sites

The Historic sequence in the ANF begins with historical accounts written by European explorers in the area. The first of these is Celeron de Blainville, who traveled down Conewango Creek and the Allegheny River by canoe in 1749 to claim the Ohio Drainage for France. By the time this area was being explored by Europeans, the indigenous populations of the previous period were replaced (i.e., through displacement and/or assimilation) by Iroquoian groups from New York. Munsee/Delaware groups pressured by Euro Americans in the east also relocated in the area about this time. The Seneca Nation of the Iroquois Confederacy apparently allowed the Delaware to relocate to the Allegheny Valley and exercised control of the refugee Indians. The locations of the Seneca and Delaware/Munsee settlements probably shifted somewhat through time but lay along the Allegheny River. None of these settlements are located near the East Side project area.

The **Pioneer period (ca. 1795-1800)**, it can be argued, overlaps well into the early part of the 19th century. Best described as a frontier adaptation, the first Euro-American "settlers" in this area were drawn to the area by the abundance of game and veritable absence of civilization. The short growing season also contributed to early settlers bypassing the ANF to seek greener pastures downstream along the Ohio River Valley. Until the railroads penetrated the interior of the continent, Olean, New York, on the upper Allegheny River, served as a major departure point for families planning to seek their fortunes by settling the newly-opened lands in the Midwest. Demographically, the population density was very low at this time period in the ANF region. No heritage resource sites of this period have been identified in the East Side project area.

The **Early Logging period (ca. 1800 - 1860)**, refers to the slow, incremental influx into the region by American settlers attracted to the region by the great stands of white pine growing along the major stream valleys in the region. The fact that the area was located at the head of the Ohio valley, which was then just opening up to American settlers, made it economically feasible to transport the lumber to downstream markets. The water-powered sawmills were usually strung along the major streams, the larger mills serving as the economic heart of small communities. Swedes and Swedish-Americans, who at that time were among the most skilled woodsmen in the world, were among the first ethnic groups attracted to such an isolated existence in such a harsh environment.

The original forest cover reportedly was hemlock/beech/maple. Early settlers in the ANF focused on harvesting white pine, which occurred in pockets, perhaps the sites of abandoned Indian villages or where fires or windstorms had created openings. The white pine resources were exhausted as the Industrial Revolution accelerated, and hemlock became the focus of forest exploitation (Marquis 1975 1994).

The early logging in the hemlock/beech/maple types in the area, however, did not result in extensive clearcutting. Trees of the desired quality were scattered, and the technology required to move large volumes of logs was not well enough advanced to permit clearcutting of major portions of the virgin forest. Most of the clearcutting was still confined to areas where streams could be used to transport logs to the mill. The result was that early cuttings tended to be scattered and patchy, partial cuts that left considerable amounts of overstory trees in most places. Sunlight levels on the forest floor increased, but conditions still favored seedlings that had a high tolerance for shade. Sugar maple and beech prospered in these conditions, and forest understories were dense with seedlings and saplings of these species making these areas ideal sources for the chemical wood factories that came later (Marquis 1975; 1994). Very few heritage resource sites of this period are present in the East Side project area and none within the proposed project units.

The **Oil Boom period, 1859-1930**, is a time when a significant population increase occurred in the region. Most of the increase was the result of immigration into the area by New Englanders, Germans, and other European immigrants. The oil boom focused on oil exploration, transportation, refining, and speculation. Arguably, the discovery of oil had the greatest economic and environmental impact in the ANF (Ross 1996). Two important aspects that the demand for oil fueled in the region were urbanization and industrialization. Railroads were built in response to oil and timber industry needs; agricultural pursuits changed from subsistence farming to commercial enterprises; and urbanization and industrialization with its populations and structured leisure time created a class of recreational enthusiasts who found pleasure in hunting, fishing, hiking, camping, sight-seeing, and recreating in the Alleghenies.

Numerous heritage resource sites associated with the historic petroleum industry are present in the East Side project area including the Bradford, Guffey, Dew Drop, and Kane Oil Fields (Ross 1996). A number of these sites are within the proposed project areas; all of these will be protected by designing all alternatives to avoid adversely affecting the sites.

The **Railroad Logging Era, 1880-1940**, represents a time when the demand for wood products spurred the construction of railroads reaching deep into the hills and hollows to transport bark and logs to mills and off to market (Casler 1973; Taber 1974; 1975). Historic logging practices have left behind far-reaching effects on the ANF's ecosystem (Marquis 1975 1994). The "pre-settlement" forest of the ANF influenced economic development and settlement systems, which in turn, influenced the development of the ecological communities, found on the ANF today.

The Industrial Revolution simultaneously created high demand for the products of forest exploitation and the technology to increase the efficiency of the exploitation. Three industries dependent upon forest products were critically important at about the turn of the century: the wood products industry, the tanning industry, and the chemical wood industry. At about the same time, railroad technology designed especially for logging was developed. Railroads could reach almost everywhere for logs, and they did (Marquis 1975). The result was that between 1890 and 1920, the forests in the region were almost completely clearcut in "what must have been the highest degree of forest utilization that the world has ever seen in any commercial lumbering area" (Marquis 1975:11).

But economics and the patterns of industrial development may have had differential effects on the forest. A gross generalization of the effect of the Railroad Logging Era is that close to the railroads associated with chemical wood factories, where haul distances were short, trees of all sizes were cut, resulting in clearcuts as complete as modern commercial clearcuts can be. In these conditions, sun-loving species, especially black cherry, a minor component of the original forest, thrived. Stands that were not close to

chemical wood company railroads had a different fate. Here, only the larger, more valuable trees were removed, and the saplings of beech and sugar maple that had started after 19th century removals of hemlock and white pine survived and prospered. Throughout the ANF, this pattern was repeated. Where railroads serving chemical wood companies reached into the forest, the dominance of sun-loving black cherry may be a reflection of the railroad logging pattern. On the other hand, where today's forest canopy is composed of a mixture of species, this may reflect where the less complete cuts for sawtimber products only had occurred. If so, then it would suggest that human use of the ANF at the turn of the century had important effects on the distribution of vegetation types.

The present forest cover now hides the numerous archaeological remains of logging railroads, chemical wood factories, huge band sawmills, lumber camps, and old town sites. A number of such sites have been identified as being located in or near the proposed project areas. Within all alternatives, the proposed project has been designed to avoid aversely affecting any of these sites.

The **Conservation period, 1923-present**, relates to public responses to changes that occurred in the region as a result of exhaustion of timber resources, wildlife resources, and soil caused by timber, and oil and gas ventures. Throughout the country, national, state, regional and local initiatives were launched to address environmental problems. Public monies, public programs, and environmental laws and regulations are the hallmark of this period. The creation and development of the Allegheny National Forest reflects the subtle and not-so-subtle nuances of the history of this period. In the early part of this period, the Great Depression occurred. Such an event might very well have accelerated the exploitation of the remaining natural resources; however, direction that the Roosevelt Administration took was to put millions of unemployed workers to work on conservation projects not only on the ANF, but also in the region and throughout the country. The New Deal programs of the 1930's, especially the Works Progress Administration (WPA), brought new jobs into the region and were the driving force behind the construction of new roads, bridges, courthouses, and schools. The Civilian Conservation Corps (CCC) provided jobs to people willing to work towards reforestation of cut-over timber land and was the progenitor organization of the Allegheny National Forest.

A number of CCC camps and CCC associated property types are located within the East Side project area. Of these a few are located near proposed project areas. None of the sites will be affected by any of the proposed alternatives.

The Conservation period is also the period when the U.S. Army Corps of Engineers undertook the construction of a number of large scale impoundments which flooded some of the region's best farm land to provide flood control, produce electrical power, and encourage the development of a recreation and tourist industry. The damming of rivers also produced a backlash effect that spawned the creation of a new conservation concept: national and scenic rivers -- and the Allegheny River was added to the Wild and Scenic River system. On a state level, the state park system was inaugurated at this time as well as the State Forests and Game and Fish Commission.

Although on a national, regional, and local scale, the wood products industry is not as extensive as it was during the Railroad Logging period, during the Conservation period its mode of transportation shifted to trucks. Unlike a number of other areas of the country where there was a "cut out and get out" strategy, through sustainable forestry practices, the wood products industry continues to be an important part of the regional economy. The regional heritage of this industry began with the construction of a sawmill by a prominent Seneca Indian Chief in 1800 and two centuries later continues to the present day.

The petroleum industry on the ANF in the Conservation period has changed dramatically from its beginning in the Oil Boom period. In its heyday during the latter period, over 90 percent of the world's oil supply was being produced from the oil fields in the region (Ross 1996). During the Oil Boom period, thousands of wells in dozens of historic oil fields were drilled. Beyond the effect to the environment that the exploration, extraction and refining had to the landscape of the ANF, the thousands of people who

poured into the region to seek employment in the oil patch also had long-lasting effects. Boomtowns grew overnight and were gone as quickly. What with the exploration and exploitation of substantially larger oil fields elsewhere in the world, the focus of the industry shifted away from the region to richer fields elsewhere in the country and around the world. The regional oil and gas industry today produces a very small percent of the overall supply of this resource to the world. The manner with which they explore and extract the resource has also undergone change during the Conservation period. Waterflood projects have replaced central power systems.

The Conservation period, with regard to industrial archaeological remains of the historic petroleum industry, is a misnomer. The present period represents the time period when most of the tangible remains of the historic petroleum industry have been obliterated from the landscape. Beginning with scrap metal drives during World War II and continuing to the present day through the work of collector and vandals, as well as well-intentioned agencies and people concerned about "getting the junk out of the forest," the historic central power systems used during the Oil Boom period have been and continue to disappear at an alarming rate. Although remains of the historic petroleum industry still exists in the region, the destruction continues through neglect, natural forces, vandalism, and in environmental cleanup efforts undertaken without regard to the heritage resource values of the industrial remains.

Environmental Consequences

Direct/Indirect Effects

Heritage resource surveys were undertaken in the East Side project areas to determine if heritage resources would be adversely affected by proposed timbering operations including thinning, final harvest, and road building within selected stands of these compartments. Direct impacts of these activities will consider the movement of heavy machinery through the forest and the construction of access roads, resulting in the disturbance of the ground surface. Obvious indirect effects of this project include the possibility of erosion in areas of direct impact and the increase in public accessibility to these stands.

Fifty-seven heritage resource sites are identified in or adjacent to the East Side project areas. Heritage resources are protected under all alternatives. All sites eligible or potentially eligible for listing on the National Register of Historic Places will remain in protected status as stated in the Forest Plan.

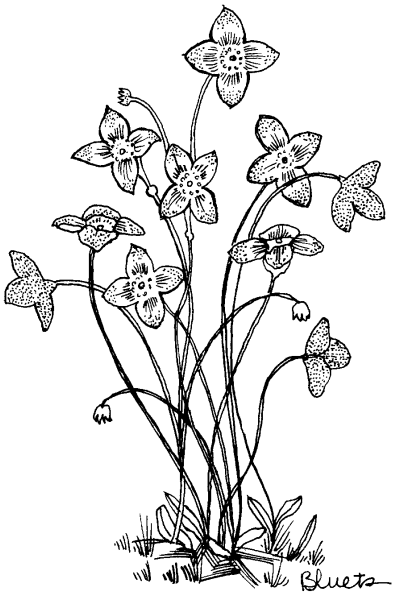
If the mitigation measures that are proposed are followed, there will be no direct or indirect effects to the sites in the project area under any of the proposed alternatives. The project has been designed to avoid adversely affecting any of the identified heritage resources.

Cumulative Effects

The cumulative effects of the proposed project on the heritage resources in the project will be minimal except where increased access provides looters and vandals with easier access to heritage resources. Elsewhere on the ANF, increased access either by the construction of new roads or opening of gated roads has led to increased incidents of looting, vandalism, or degradation to heritage resources. Potential for disturbance from the general public is possible, but the probability is low because site locations are not disclosed. The probability for disturbance increases with the closeness of a site to a road.

Summary of Mitigation Measures and Effectiveness

Mitigation measures include "flag and avoid" strategies that have been successfully and effectively employed in other ANF projects throughout the years. Each site is marked with colored flagging that identifies it as a heritage resource. Most sites will be protected by 30-meter buffer areas around heritage resource sites to protect them from being adversely affected by ground disturbing activities. In the case of the Tionesta Mound, a Woodland period burial mound, the buffer area is increased to 100 meters not only to ensure that ground disturbing activities will be conducted well away from the burial mound but will provide the site increased protection from windthrows occurring near or at the site location as a result of increased exposure of the remaining trees to high winds. A different site protection strategy will be employed at historic petroleum industrial sites such as "powerhouses" or central power sites. Mitigation measures at these sites will consist of directionally felling and skidding trees away from the powerhouse, rod lines, and pump jacks. Monitoring of a select number of the heritage resources during and after project implementation activities is also included as a mitigation measure.



Recreation

Affected Environment

The affected environment for recreation is described through the recreation opportunity spectrum and areas of concentrated use.

Recreation Opportunity Spectrum

Many recreation opportunities exist within the Allegheny National Forest. Users can participate in a wide range of experiences within a variety of settings. The Recreation Opportunity Spectrum (ROS) is used to classify the range of experiences and settings available on a given piece of land (USDA-FS 1986d). On the Allegheny National Forest, ROS classes range from Semi-primitive, Non-motorized *(where there are few or subtle modifications by humans with a large probability of isolation from human sights or sounds)* to Rural *(where sights and sounds of humans are prevalent and the landscape has been considerably altered by human works).* Table 89 identifies the existing condition for the percent of the project area that falls into the various ROS classes (USDA-FS 1986a, p. A23-25). Six setting indicators are used to evaluate the ROS class. When setting indicators move from meets to inconsistent or unacceptable, the existing conditions do not meet the ROS objectives.

Table 89. Existing Condition of ROS Classes

			Setting Indicators					
MA	**ROS Class**	**% of Project Area**	**Access**	**Remote-ness**	**Site Mgmt**	**Visitor Mgmt**	**Social Encounters**	**Visitor Impacts**
7	Rural	<1	Meets	Meets	Meets	Meets	Meets	Meets
3.0 & 2.0	Roaded Natural	84	Meets	Exceeds	Meets	Meets	Meets	Inconsistent
6.1 & 8	Semi-primitive Motorized	11	Meets	Exceeds	Meets	Meets	Meets	Meets
6.2	Semi-primitive Non-motorized	4	Meets	Exceeds	Exceeds	Meets	Meets	Meets

Two discrepancies were known and accepted when the Forest Plan was approved. First, MA's 6.1 and 8.0 contain developed roads (TSL B and C). ROS guidelines state that the Semi-primitive Motorized class should contain primitive road (TSL D) and motorized trails. Secondly, the Twin Lakes Recreation Area is a development level four campground, and is located in MA's 3.0 and 6.1. In the Roaded Natural and Semi-primitive Motorized classes, the usual level of development is three or less. Since these discrepancies were known and accepted when the Forest Plan was approved, the setting indicators are considered to meet ROS objectives as established in the Forest Plan. For MA's 3 and 2, "Visitor Impacts" are considered *inconsistent* for the Roaded Natural ROS class. This is due to the Marienville ATV/Bike and Timberline ATV Trails having areas of site hardening that is inconsistent with ROS guidelines. All other indicators are met or exceeded for each of the ROS classes, as noted in Table 89.

Areas of Concentrated Recreation Use

Every acre of National Forest does not support the same amount of recreation. Most acres within the project area support a low amount of recreation use. Areas near campgrounds and trails receive the highest amount of recreational use. The larger stream corridors support a moderate amount of dispersed recreation such as camping, fishing and hunting. Driving for pleasure is the most popular recreational pursuit on the ANF, especially during the spring, fall color, and hunting seasons (USDA –FS, 1998d).

Facilities

Twin Lakes, Red Bridge, and Kiasutha Recreation Areas are located in the north, northwestern part of the East Side project area. These recreation areas feature developed campsites and picnicking areas.

Within the East Side project area, five designated forest trails are located entirely within the project boundary, and six designated forest trails are located partially within the project boundary. Table 90 identifies the trails and provides details on the mileage within the project area, total mileage, and use characteristics. The project area also overlaps portions of the Marshburg-Stickney, Westline, Highland-Owls Nest-Twin Lakes, and Bluejay-Duhring Intensive Use Areas (IUA). These IUA's (plus the Grunderville-Chapman IUA) were established in the Forest Plan. All new off-road vehicle (ORV) trail construction is limited to these IUA's on the ANF.

Several recreational special events related to facilities found within the project, such as dog sled races, ATV trail rides, and cross-country ski and mountain bike competitions, also attract additional people to the area on an annual basis.

Table 90. Trails in the Project Area

Trail Name	Miles in Project Area	Total Trail Length (mi)	Amount Of Use	Season Of Use	Primary Use
Allegheny Snowmobile Loop (ASL)	74.1	156.1	Moderate	Winter	Snowmobile
Black Cherry Interpretive	1.4	1.4	High	Spring-Fall	Interpretive
Brush Hollow X-C Ski/Hiking	7.7	7.7	Moderate	All Year	Cross Country Skiing/ Hiking
Longhouse Interpretive	1.1	1.1	Moderate	Spring-Fall	Interpretive
Marienville ATV/Bike	27.1	37.3	High	All Year	Trail bike, ATV
Mill Creek Hiking	5.6	5.6	Low	Spring-Fall	Hiking
North Country Trail (NCT)	29.0	96.6	Moderate	Spring-Fall	Hiking
Snowmobile Connectors	52.3	141.9	Moderate-High	Winter	Snowmobile
Timberline ATV	18.5	37.9	High	All Year	Trail bike, ATV, Snowmobile
Tionesta Scenic Area Interpretive	1.0	1.0	Moderate	Spring-Fall	Interpretive
Twin Lakes Hiking	16.5	16.5	Low	Spring-Fall	Hiking
Westline X-C Ski/Hiking	5.5	9.8	Low	Winter	Cross Country Skiing

Sensitivity Levels

Although Sensitivity Levels are primarily used in developing visual quality objectives, they are also useful in identifying high recreational use areas. Level 1 areas are defined as all major highways, roads with heavy recreational traffic, entrances to developed recreation sites and scenic roads. Several Sensitivity Level 1 roads and areas occur in the project area. Such areas include: State Routes 59, 66, 321, 948, 1003 (Bluejay Road), 3006 (Westline Road); US 6; Forest Roads 122, 128, 133, 145, 148, 149, 225, 262, 321, and 497; Brush Hollow Trailhead; and the Kiasutha, Red Bridge and Twin Lakes Recreation Areas.

Unique Features

Tionesta Scenic and Natural Areas, Marsh Ponds (FR 150), Allegheny Reservoir, Fish Hatcheries at Pigeon and Pigs Ear, Watson Branch Rocks, and Olivio Rocks (FR 182) have been identified as unique features –within the project area that draw recreationists into the area. The scenic and natural areas are located adjacent to each other and feature some of the oldest and largest tracts of virgin beech-hemlock climax forest. There are rock cities (groupings of large house-sized rocks) along Watson Branch and FR 182 (known as Olivio Rocks). The Marsh Ponds are constructed ponds along FR 150 and are maintained by the PA Game Commission. There are no designated wilderness areas within the project area.

Dispersed Camping

In considering the project area in total, most of the project area supports a small amount of dispersed camping. Areas of concentrated dispersed camping occur across the project area, but sites near water bodies are the most popular. The following places are recognized as concentrated dispersed camping areas: FR 395 Trailhead, Fox's Dam, Pigs Ear, Red Mill, Forest Roads 110, 120, 122, 123, 133 (north of Tionesta Scenic Area), 141, 143, 145, 148, 150, 232, 321 and 457.

Hunting and Fishing

Hunting for all game occurs across the project area with concentrations along roads and near seasonal and year-round residences. However, some areas such as Twin Lakes and the Tionesta Scenic Area~~s~~ are heavily hunted for bear. Parking along Forest System Roads is often a problem during hunting seasons due to increase in vehicles, narrow corridors, and minimal number of turnouts. Forest Roads 226, 332a, 458, and 458a are designated as disabled hunter roads. This designation allows permitted hunters with disabilities to use their vehicle as a blind.

Big Mill Creek, Bluejay Creek, Kinzua Creek, South Branch Kinzua Creek, Meade Run, East Branch Tionesta Creek, South Branch Tionesta Creek, Salmon Creek, Allegheny Reservoir, Twin Lakes, and the Marsh Ponds (FR 150) are heavily fished waters within the project area. Crane Run and South Branch Kinzua Creek (which are located either partially or wholly within the project area) are designated Wilderness Trout Streams.

Environmental Consequences

Direct/Indirect Effects

Recreation Opportunity Spectrum

Under Alternative 5 (no action), there would be no change in the existing condition for any of the ROS classes.

There are no proposed actions in the East Side project within the Rural or ~~within the~~ Semi-primitive~~,~~ Non-motorized ROS classes. Therefore, there will be no change from the existing condition due to East Side project proposals.

In the Roaded Natural ROS class, the proposed actions meet ROS objectives. The setting indicator of remoteness will change from exceeds to meets due to the road and harvest activity within the project area.

Within Semi-primitive Motorized ROS class (MA 6.1), there are three reforestation treatments in Compartments 492 and 493 that will affect the remoteness setting in Alternatives 1, 3, and 4. These treatments do not occur in Alternative 2. These proposals will reduce the feeling of *remoteness* within close proximity of the treatments. The remoteness setting indicator will change from exceeds to meets. The other setting indicators will not change as a result of the project proposals in the action alternatives.

Areas of Concentrated Recreation Use

In Alternative 5 (No Action), mortality areas will have a higher than normal percentage of standing dead trees and a thick growth of shrubs, fern, and/or grasses that could make passage unsafe and difficult. Mortality areas may be less desirable for recreation because of the increased shrub growth and risk of falling limbs which may displace use for up to 30 years or until the stand grows past the sapling stage. Young forests are difficult to use because of the thick growth. No displacement of recreationists due to logging will occur. Additionally, no transporation activities are associated with this alternative. Overall, no loss of recreation use is expected under Alternative 5.

Within the East Side project, most timber management occurs in MA 3.0 and in areas of low recreational use. There has been no indication that the tree mortality has affected where visitors choose to recreate. Some recreationists will be turned off by the logging (Alternatives 1-4) and will choose to recreate elsewhere. Often a suitable site is found within a few miles of the original site. Recreation dependent on a natural appearing setting (see glossary) and some feeling of isolation is lost for a period of 10-15 years during and after the final harvest. Recreation experiences associated with sawtimber-sized stands are lost for approximately 50 years following a final harvest. Some recreation opportunities may actually increase as a result of final harvest cutting such as bird watching or hunting for species that are dependent on early successional habitat (USDA-FS 1986, p. 4-23). Fencing has a short-term impact on recreation as it impedes the mobility of recreationists. The effect of herbicide on recreation use may be a displacement to adjacent areas of all forms of recreation for one or two months after treatment, depending upon a person's personal preference.

The new construction and improvements to roads will permit better access to the National Forest across the project area for pedestrian traffic, mountain biking, or cross-country skiing. Alternatives 1, 2, and 4 feature road betterment, new road construction, and restoration. Alternative 3 features only road restoration. Alternative 5 features no new road activities, but maintenance on all existing roads will continue. ~~Please r~~Refer to Chapter 2 and the transportation section in Chapter 3 for proposed mileages of

each type of activity. ~~Improvements to FR 243 will permit this road to be opened during hunting seasons.~~

Harvesting that adjoins areas of concentrated recreational use has received additional attention to ensure the recreational investment is protected. The effects of timber management on recreational facilities are managed in a number of ways. This includes mitigation, alteration of the treatment, or occasionally dropping the activity.

Facilities

There are no proposed treatment units adjacent to Kiasutha, Red Bridge or Twin Lakes Recreation Areas. No harvesting is planned near Tionesta Scenic and Research Natural Areas. Therefore, no affects are anticipated.

Trail users will be the most affected recreationists in the East Side project. Timber management will be more evident to trail users. Table 91 identifies the amount of trail mileage within harvest units. The Marienville ATV/Bike Trail, Allegheny Snowmobile Loop, Snowmobile Connectors, Twin Lakes Trail and North Country Trail have harvest treatments bordering the trail. For most trails, the amount of adjacent harvesting is less than four percent of the trail mileage within the project area. Approximately 21% of the Marienville ATV/Bike Trail miles within the East Side project would be affected in Alternative 1; 5% in Alternative 2, 9% in Alternative 3, and 11% in Alternative 4. The ATV Trails are a Sensitivity Level 3 corridor because trail users generally are not interested in a high degree of scenic integrity but do enjoy the forest environment as opposed to a more developed atmosphere. There are no harvest units adjacent to the Black Cherry, Brush Hollow, Longhouse, Mill Creek, Timberline, Tionesta Scenic Area, or the Westline Trails. No harvest activities are proposed in Alternative 5 and will not impact the trails. Refer to Table 91 for more information.

Table 91. Trail Miles Within Harvest Units

	Miles in Harvest Units					
Trail Name	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Miles in Project Area	Total Trail Length (miles)
Allegheny Snowmobile Loop (ASL)	2.6 (4%)	1.9 (3%)	2.3 (3%)	2.2 (3%)	74.1	156.1
Black Cherry Interpretive	0	0	0	0	1.4	1.4
Brush Hollow X-C Ski/Hiking	0	0	0	0	7.7	7.7
Longhouse Interpretive	0	0	0	0	1.1	1.1
Marienville ATV/Bike	5.6 (21%)	1.4 (5%)	2.4 (9%)	3.1 (11%)	27.1	37.3
Mill Creek Hiking	0	0	0	0	5.6	5.6
North Country Trail	0.7 (2%)	0.3 (1%)	0.3 (1%)	0.3 (1%)	29.0	96.6
Snowmobile Connectors	2.1 (4%)	1.8 (3%)	1.8 (3%)	1.8 (3%)	52.3	141.9
Timberline ATV	0	0	0	0	18.5	37.9
Tionesta Scenic Area Interpretive	0	0	0	0	1.0	1.0
Twin Lakes Hiking	0.4 (2%)	0.4 (2%)	0.4 (2%)	0.4 (2%)	16.5	16.5
Westline X-C Ski/Hiking	0	0	0	0	5.5	9.8

(%) Percent of trail within project area

In all alternatives (including no action), additional trail maintenance will be necessary for 5-10 years to keep trails brushed out due to the additional sunlight stimulating fern, seedling, and briar growth. Since this state of tree mortality has existed for several years, many trails have already seen an increase in brushy growth. This is expected to increase and expand if trees are harvested under Alternatives 1-4. Mortality units, because they differ in vegetative composition and structure, will offer the recreationist an opportunity to see different wildlife species. The dead and dying trees harvested will reduce the amount of fallen trees on the trail. (See Human Health and Safety Section for additional information). Trail riders will be displaced while the Marienville ATV Trail is closed in the winter months for harvesting operations.

A variety of harvest treatments are employed adjacent to the trails. In Alternatives 1 and 3, approximately 73% of the trailside treatments will leave a mature canopy of trees. Alternatives 2 and 4 will leave a mature canopy of trees. Alternative 5 does not involve any harvest of trees but in areas affected with severe tree mortality, remaining live trees could be few and far between.

Some harvest treatments along hiking trails were modified not only to preserve the trail experience and character but also to minimize the amount of sunlight reaching the forest floor and minimize maintenance needs. In Alternative 1, harvest treatments along the North Country Trail in Compartment 801, Stands 31 and 33 were changed from shelterwood treatments to two-age treatments to maintain a mature canopy of trees. In Alternatives 2 and 4, these treatments will only salvage the dead and dying trees which is smaller percentage of the trees. Alternative 3 features no harvest units along the NCT. In Alternatives 1-4, harvest treatments along the Twin Lakes Trail in Compartment 841, Stands 33 and 35 were pushed 100 feet back from the edge of the trail. In Alternative 5 there will be no harvesting along these trails.

Table 92 identifies the road activity on trails. Road construction activities on trails will not occur during the primary use season. However, it is likely that some trail users will be inconvenienced by the construction activities during the low use seasons. Mitigation measures are prescribed to ensure the safety of trail users during construction activities. Overall, the construction activities are not expected to change the character of the trails since they are already located on roads. The new road construction near the Marienville ATV/Bike Trail will permit easier access for maintenance activities. The road decommissioning that would occur on a trail is a section of FR 126 (Allegheny Snowmobile Loop) that is being realigned to a better location. In Alternatives 1, 2 and 4, a new road will be built across the North Country Trail in Compartment 801, which will reduce a sense of solitude and remoteness.

Table 92. Road Activities on Trails

Road Activity	Alt. 1 (Miles)	Alt. 2 (Miles)	Alt. 3 (Miles)	Alt. 4 (Miles)	Trails Affected
New Construction	0.8	0.0	0.0	0.0	Marienville ATV/Bike
Betterment	1.7	1.1	0.0	1.6	Marienville ATV/Bike & Snowmobile
Decommissioning	0.2	0.2	0.0	0.2	Snowmobile
Restoration	17.2	15.8	16.0	16.2	Marienville ATV/Bike & Snowmobile
Long Skid	0.0	0.0	0.7	0.0	Snowmobile

New stone pits will be developed, and existing pits will be expanded to supply stone for road activities. Alternative 1 features the construction of 10 new pits and expanding 33 existing pits. Alternative 2 features the construction of 8 new pits and expanding 28 existing pits. Alternative 3 features the

construction of 7 new pits and expanding 26 existing pits. Alternative 4 features the construction of 10 new pits and expanding 33 existing pits. No new pits would be expanded or developed under Alternative 5 as a result of this project. Recreationists often use ~~G~~stone pits for camping, target shooting and parking. They are especially useful to dispersed campers with large Recreational Vehicle (RV) units and equestrian campers. Pits adjacent to the ATV/Bike trails are used as skill-testing areas by trail riders. Occasionally, pits are used as trailheads. The pit along FR 401 serves as an ATV trailhead. This~~e~~ pit will be expanded and once closed will offer more trailhead parking space. Road building activities in the Marienville ATV/Bike Trail area are~~is~~ limited to the closed season, so this pit will not be active during the summer use season.

Sensitivity Levels

In Alternatives 1-4, 5 – 7% of the harvest acreage occurs along Sensitivity Level 1 roads. In Alternatives 1 and 3, 94% of those treatments will not remove the overstory. The other 6% is one shelterwood removal along SR 948, which will remove the overstory. Alternatives 2 and 4 feature salvage thinning and uneven-aged management respectively, which will leave an overstory. Alternative 5 (no action) also will leave an overstory.

Dispersed Camping

In Alternatives 1 and 3, there is one thinning unit adjacent to the Marienville ATV/Bike Trailhead on FR 395, a popular dispersed camping site. Campers are generally trail riders. The unit will be harvested when the trail is closed. This thinning will not change the character of the landscape adjacent to the trailhead. The slash will provide firewood for campers. There are no other harvest units adjacent (within 100 feet) of the other areas of concentrated dispersed camping use identified in the affected environment.

Unique Features

Olivio Rocks, identified in the Affected Environment section as a unique feature, is near Compartment 439, Stand 13. This stand is proposed as a shelterwood treatment in Alternatives 1 and 3 and as a salvage thinning treatment in Alternatives 2 and 4. Alternatives 1, 3 and 4 also propose fencing the stand. Neither the harvest nor fencing treatment is within 100 feet of the rocks. There are no treatments within 100 feet of the other identified unique features within the project area. Therefore, no affects are anticipated.

Hunting and Fishing

Across the project area, the new harvest areas associated with the action alternatives will attract hunters. Where area fencing is proposed, recreation use primarily related to hunting in those areas would be displaced to adjacent areas until the fences are taken down in 5-10 years. There is a small but growing group of users who do hunt within fences, but most will move to another location.

Along FR 458, a disabled hunter road, three harvest treatments are proposed. In Alternatives 1 and 3, the treatments are one shelterwood (with a fence), and two salvage thinnings. There are no roadside treatments in Alternative 2, and in Alternative 4, there is one reforestation treatment that includes a fence. The treatments will add some variety to the habitats found along the road, which will attract more game species. The resulting slash may make it more difficult for persons with limited mobility to move through these stands to hunt or retrieve their game. Parking along Forest System Roads is often a problem during

hunting seasons. Small parking areas (3-5 car) will be constructed at the gate on FR 243 in all the alternatives; at the gate on FR 476 in all alternatives; and at the gate on FR 742 in Alternative 1.

Harvesting occurs along the headwaters of Crane Run, identified as a unique or high use stream within the project area. However, Forest Plan standards and guidelines specify a filter strip of at least 50 feet along intermittent and perennial streams and no effects are anticipated.

Under Alternative 5, no additional fencing or harvesting would occur. New 0-20 year vegetation would not be created except through natural processes.

Cumulative Effects

The cumulative effects area is the project area and the cumulative effects period is from 1986 to 2019.

Within the last 10 years, the following recreation projects were completed within the project boundary: Kane Snowmobile Connector relocation, Twin Lakes Recreation Area rehab, Timberline ATV Trail construction, Brush Hollow Trail construction, Red Mill site improvements and vault toilet installation, bridge replacement on North Country Trail, and Westline Trail construction.

Within the next 10 years the following recreation facilities are scheduled for rehabilitation: Kiasutha Recreation Area, Marienville ATV/Bike Trail, Timberline ATV Trail, Red Bridge Recreation Area, and vault toilet replacement at Twin Lakes Recreation Area. Maintenance of all recreation facilities constitutes a majority of the effort devoted to the recreation program. Maintenance does not require NEPA analysis.

Recreation Opportunity Spectrum

Marienville ATV/Bike and Timberline ATV Trails are scheduled for major trail rehabilitation within the next five to three years. Current and future trail rehabilitation activities will strive to meet the ROS setting indicator for visitor impacts. In general, all future activities would strive to meet ROS class objectives on Federal Land.

Areas of Concentrated Recreation Use

Our experience, based on feedback from our field personnel, demonstrates that recreationists generally move to another location if harvesting affects a primary activity. Most areas~~ and facilities~~ on the ANF receive low to moderate recreation use indicating that supply exceeds demand. The nature of dispersed recreation is that it is flexible and based on the needs of the user and the resources of a piece of land at a given time. The recreationist has an opportunity to choose and enjoy a wide variety of recreation experiences on the National Forest. This opportunity is not duplicated on many other public lands.

Future harvesting that would adjoin areas of concentrated recreational use would receive additional attention to ensure the recreational investment is protected. The effects of timber management on recreational facilities are managed in a number of ways, including the use of mitigation, alteration of the treatment, or occasionally dropping the activity.

The Comprehensive Plan for Management and Use for the North Country Trail (USDI-NPS. 1982, p. 26), states, “It is not the intent of this plan to completely isolate the user from land use practices surrounding the trail, but rather to allow the traveler to enjoy the mosaic of resources and land uses through which the

trail passes while taking special advantage of the natural and scenic elements along the way. Thus resource management activities such as timber cutting, even occasional clearcutting, are not out of harmony with the management of the NCT." Additionally, there are no standards or guidelines on the amount of timber harvest that is appropriate along the NCT. For this reason, the cumulative effects area for the NCT will encompass what is within the East Side project area, and not the entire length of the NCT on the ANF.

Timber harvest, and oil and gas development has been prevalent along the Marienville and Timberline ATV Trails, and yet trail use continues to increase very year.

The age of the stands within the entire project area (Table 93) was compiled to illustrate how much timber management is apparent. Claims are often made that timber harvest has reduced the amount of recreation opportunities on the ANF. However, the effects of timber management on recreation do not accumulate over time. As years pass, older harvest treatments will grow and develop a more natural appearing setting, as new harvest treatments assume a more managed appearance.

Table 93. Age Classes by Alternative

Age Class	Present (1999)	Alt. 1 (2019)	Alt. 2 (2019)	Alt. 3 (2019)	Alt. 4 (2019)	Alt. 5 (2019)
No Age	3%	3%	3%	3%	3%	3%
0-20 years	11%	12%	10%	11%	10%	10%
21-50 years	6%	16%	16%	16%	16%	16%
51+ years	79%	68%	70%	69%	70%	70%
Unknown	1%	1%	1%	1%	1%	1%

No age stands are composed of meadow and shrubby type landscapes. Stands in the 0-20 year age class have had the overstory removed (harvested) within the last 20 years. At this age, stands are difficult to use as slash is abundant and the sapling growth is thick. Twenty-one to 50 year-old stands appear as young forest, and 51+ year-old stands appear as mature forest. Timber management that does not result in an overstory removal is not represented, as it would not change the stand age. In these stands, slash would be evident from 3-5 years following the harvest. After that, the stand would be natural appearing (see glossary).

Timber management that results in an overstory removal has a long-term effect on the appearance of the area and the amount of recreational use. In the East Side project, Alternatives 1 and 3 will have treatments that result in an overstory removal. These treatments constitute 1-2% of the entire project area. Recreationists may be displaced from these areas for 10-50 years depending on their personal preference. As demonstrated in the above table, the age class shows little variance between the action alternatives (Alternatives 1-4) and the no action alternative (Alternative 5). Over 69% of the project area is natural appearing forest that supports a wide variety of recreational uses.

During cumulative effects period (1986-2019), the percentage of the project area that has been and will be treated for timber harvest is: Alternative 1 is 46%; Alternative 2 is 43%; Alternatives 3 and 4 are 44%; and Alternative 5 is 41%. Harvesting that results in overstory removals constitute about 20% of the project area if Alternative 1 or 3 is chosen, and 18% in Alternatives 2, 4, and 5. Harvest treatments that result in the greatest change to the landscape and thereby have the greatest effect on recreation constitute less than half of the harvest activity over the long term. Sixty-three and six tenths of a mile of road restoration, 0.3 miles of new construction, and 0.6 miles of betterment are anticipated to occur for future

timber treatments in the East Side project area. Recreationists should expect to see evidence of timber harvest along roads and trails. All management proposals are analyzed to ensure they meet Forest Plan standards and guidelines in all resource areas.

An additional cumulative effect to recreation is OGM development. Most of the subsurface rights on the ANF are not owned by the government and are available for private development. The effect on recreation is a loss of remoteness and visual quality, and an increase in road access. The effect does accumulate over time. Within the project area, OGM development is expected to increase about 2% during the cumulative effects period. Additional roads and stone pits are a part of the OGM development.

Summary of Mitigation Measures and Effectiveness

Site specific mitigation measures are identified in Appendix D and are specified as VE1, VS3, and R1 through R11.

Slash treatment is proposed along all trails and most open roads. This primarily serves to lessen the visual impact of harvesting but also serves a safety purpose. Slash is pulled back 15-25 feet from the road or trail edge to provide a cleared corridor. Slash is also cleared from major skid roads, pipelines, and other corridors to permit easier passage through harvest areas.

Seasonal restrictions are used for a variety of purposes and have been effective in minimizing effects. In Compartments 684, 700 and 701, harvesting along the Marienville ATV/Bike Trail is permitted only from October 1 to May 20. Usually, trails are not closed during harvesting operations but are signed to warn users. In this case, the intensity of the resource management and the high level of use on the trail prompted us to take additional measures. Permitting both to occur at the same time would put both parties at risk. Rather than disrupt trail use during the heaviest season of use, we decided to close the trails in the winter and only permit harvesting operations at that time. A few units in Compartment 700 can be harvested during the summer use season from Monday to noon Friday. These units are on the periphery of the trail system and will have minimal impact on trail use. This measure was applied to limit seasonal harvest and hauling restrictions, therefore, giving harvest operators more flexibility.

Seasonal restrictions have also been used along the North Country Trail. Harvesting and road building activities in the trail vicinity will occur only during frozen ground conditions (January to mid March). Based on our experience, this measure will effectively reduce impact to soils and will preserve the hiking experience during the fair weather seasons. Along the Allegheny Snowmobile Loop, hauling is restricted on weekends when conditions are favorable for snowmobiling. This measure was reached through the agreement of the snowmobilers, Forest Service and harvest operators. Along FR 458 and 458a, which are disabled hunter roads, harvesting and road building activities will occur outside of hunting seasons.

Other miscellaneous measures are used along trails to protect recreation facilities and opportunities. Signs identifying herbicide treatments are posted along the perimeter where people are likely to access the area. No herbicide treatment is permitted on weekends in units adjacent to trails (except snowmobile trails on roads). Snowplowing of designated snowmobile routes will be done as to leave an adequate path of snow for grooming and snowmobile operation. Road construction and reconstruction that occurs on trails (some trails are located on roads) are seasonally restricted to ensure the safety of the trail users and harvest operators. Fences are kept to a minimum of 50 feet from the edge of trails to provide a corridor for safety. Skidding on trails is permitted in some circumstances where it will not change the character of the trail or pose a threat to trail users. It is beneficial to permit skidders to use trails rather than create new skid trails through the general forest environment. In all cases, harvest operators are required to return the trail to its original condition when used for skidding.

Visual/Scenic Resources

Affected Environment

The topography in the East Side project area includes a forested plateau, with steep side slopes that are dissected with rivers and streams. A variety of vegetation including Upland (black cherry, red maple), Northern (beech, sugar maple, hemlock, yellow birch), and Allegheny hardwoods (black cherry, yellow poplar, white ash) is found in the project area. This landscape has a history of human disturbance yet is a natural forest after years of growth and management.

Although East Side encompasses parts of several MA's, the management areas of primary concern that potentially could be affected with this project are MA's 2.0, 3.0, and 6.1. As described by the Forest Plan, MA 2.0 areas will generally have a continuous crown canopy consisting primarily of uneven-aged Northern hardwood stands of a variety of ages and size classes. For areas having MA 3.0 objectives, trees will be in a variety of sizes and ages as seen like a mosaic of hardwood stands along the various travel ways. MA 6.1 emphasizes a land condition with vegetation predominately made up of mature or over mature hardwood forests. In this MA, one of the primary purposes is to maintain or enhance scenic quality. Please refer to the Forest Plan description of each of these management areas for more information.

Two approaches will be used to describe the visual resources of this area. These are the Visual Management System (VMS), (USDA-FS 1974), and the Scenery Management System (SMS), (USDA-FS 1995c). Our focus will be the VMS and the unit of monitoring called Visual Quality Objectives (VQO). Several concepts from SMS such as Scenic Integrity will be used to help define the affected environment.

Visual Quality Objectives

Visual Quality Objectives, as discussed in the Forest Plan, refer to the degree of acceptable alteration of the characteristic landscape. In East Side, most of the area is considered either Modification or Maximum Modification VQO. Maximum Modification allows the vegetative alterations to dominate the landscape. Modification allows vegetative alterations to dominate but must borrow from naturally established features. Along major and secondary roads and trails, the VQO is Retention or Partial Retention. Human activities may be evident but must remain visually subordinate to the characteristic landscape.

Visual Quality Objectives (VQOs) are determined from three basic components:

1. Variety and uniqueness of a landscape relative to what is common.
2. Sensitivity or concern level of the travel way based on the expectation of viewing scenery and the amount of use (SL1, SL2, or SL3).
3. Distance and visibility from a given travelway.

Maintaining and improving the visual quality of the scenic travelways on the ANF is one goal of the multiple use concept that guides our forest management. All travelways within the East Side project area were evaluated including roads, trails, use areas, rivers, and streams. Sensitivity Levels (SL) are the degrees or measures of viewer interest in the scenic qualities of the landscape. Three levels of sensitivity, ranging from most sensitive (SL1) to least sensitive (SL3), were assigned to specific travelways on the

forest. Views along major and secondary corridors within the East Side project area were the primary focus and concern.

In East Side, SL 1 areas include 24 miles of the North Country Trail and 30 miles of roads such as SR948, SR321, FR133, and FR262. The project area also includes a portion of 11 watersheds that flow into three major water bodies that are classed as Sensitivity Level 1 Travelways. These include the Clarion River, Tionesta Creek, and the Allegheny Reservoir including Kinzua Creek.

Sensitivity Level 2 (SL2) trails, such as Twin Lakes and Brush Hollow, total 24 miles within the project area. Roads considered SL2 account for 53 miles and are traveled for scenic viewing and dispersed recreation activities. The Knox-Kane Railroad is a 48-mile track that operates during the summer and fall months. The 20-mile section that transects the ANF is also considered SL2. Mitigation along this right-of-way may appear different from a typical road corridor. The variation allows for openings in the forest canopy to allow a viewer to see into the forest. These openings create scenic variety and interest on a long day's ride through the forest. Also considered SL2 are eleven tributary streams (South Branch Kinzua Creek, Kinzua Creek, Crane Run, Big Mill Creek, East Branch Tionesta Creek, Two Mile Run, East Fork Run, Bear Creek, Salmon Creek, Meade Run, and Spring Creek) within the East Side boundary. They are classified as such based on the amount of use and scenic variety. Two of these streams are also characterized as wilderness trout streams (South Branch Kinzua Creek and Crane Run) and possess a "wilderness character" that people desire and seek to protect.

Sensitivity Level 3 (SL3) areas have the least concern for scenery based on low use, seasonal use, or the perception that viewing scenery is not the primary objective for traveling these corridors. Travelways in the project area with a low sensitivity or concern level include the ATV and snowmobile trails.

Scenic Integrity

Scenic Integrity is defined as a measure of the degree in which the existing visual condition of a landscape is perceived to be complete. For the East Side project, scenic integrity refers to the degree of deviation from a natural appearing, forested condition. A higher rating is given to those landscapes in which there is little or no deviation from its valued aesthetic character. A lower rating is given to landscapes where the deviation dominates the character of the landscape.

In recent years, tree mortality has affected the existing natural appearance of the forest along certain travel corridors within the project area. Approximately 50 percent of the project area has light to moderate mortality, and at least 25 percent of the project area has severe mortality. The degrees of deviation from a natural appearance of the forest in the East Side project area range from a healthy, lush forest with some dead and dying branches to a forest having little to no canopy. In extreme cases, the remains of what was once a healthy stand of trees has become hillsides of standing dead trees. These landscapes are dominated by dead and dying trees that impact the natural appearance of the forested landscape. The contrast between the dead, gray/brown material and the live, green material is viewed most often during the spring, summer, and fall. These are seasons of high visitor use of the forest and when foliage is on the trees. Mortality, when seen in the foreground, has the greatest impact. In conditions of light to moderate mortality, green trees provide some screening of dead and dying trees. The viewer may occasionally notice tree mortality, but it does not dominate the natural appearing landscape. Mortality, when viewed as middle or background, is generally less critical. However, if the foreground is open and large areas of severe mortality can be viewed to the middle ground and background, impacts will dominate and visual contrasts will affect the visual quality.

Because of the mortality, some areas within the East Side project have experienced a loss of Scenic Integrity. Severe mortality has lowered the Scenic Integrity and has caused some sensitive travelways to

fall below visual quality standards. In most cases, visual mitigation can be applied and Visual Quality Objectives can be met. However, there are a few cases with this project that impacts from the mortality have affected Scenic Integrity to the point where VQO cannot be met. This condition is most noticeable where there is extensive, catastrophic mortality expanding beyond 40 acres in size. When the individual stands do not meet visual objectives because of mortality, the joining of stands in a similar condition adds to the impact.

Environmental Consequences

Direct/Indirect Effects

The primary goals in the planning process for the East Side project were to maintain Visual Quality Objectives and improve Scenic Integrity by minimizing visual contrast created by the mortality. Views along Sensitivity Levels 1 and 2 corridors were considered in conjunction with proposed treatments for impacts to VQOs. (USDA-FS 1986a) These corridors were also evaluated for Scenic Integrity.

In most cases, management activities associated with this project are proposed on the plateau tops and away from travelways. However, some activities are proposed along travel corridors and side slopes. Of greatest concern are treatments in the foreground or within 300' of a road corridor considered a primary or secondary travelway. Unless the natural foreground vegetation sufficiently screens or buffers the treated areas, treatments within these areas of concern require a vegetative buffer or their boundaries adjusted to mitigate effects of mortality and decline. In some cases, mortality is difficult to buffer. Impacts of extreme mortality near areas of recent harvest (0-10 year vegetation) can create visual impacts on areas totaling over 40 acres. Generally, regeneration harvests will not exceed 40 acres in size (CFR 219.27 (d)(2)). However, an exception is made if the size of harvest areas is the result of natural catastrophic conditions such as fire, insect and disease attack or windstorms (Forest Plan, p. 4-87; CFR 219.27 (d)(2)(iii)). Mitigation continues to be required to minimize visual impacts and to maintain the Visual Quality Objectives.

As noted above, some areas are difficult to buffer. There are 22 areas in MA 3.0 where proposed harvesting of mortality lies adjacent to recent harvests (0-10 year vegetation) areas, creating the greater than 40 acre situation. Six of these areas lie along sensitive road corridors (SL1/SL2) with a high Visual Quality Objective. Of the six areas, five will meet Visual Quality Objectives with mitigation applied. One area (Block 2) has a lower Scenic Integrity Level and will not meet VQOs even with mitigation. (See Table 94. Visual Mitigation in Blocks Exceeding 40 Acres) When VQO cannot be met through mitigation, regenerating the foreground as quickly as possible is considered the best alternative. The short-term effects of regeneration will speed the cycle of greening up an otherwise devastated area (Hoffman and Palmer 1996, pp. 8-10).

Based upon past experience, one of the most effective practices for the restoration or regeneration of forests on the Allegheny Plateau is even-aged treatment. Some examples include clear-cut, salvage clear-cut, and shelterwood seed/removal cuts. These treatments create visual contrast and openings that are considered "temporary" in the Forest Plan (Forest Plan, p. 4-12). An opening is no longer considered "temporary" when the height of its vegetation is at least 20 percent of the height of the surrounding vegetation. This usually occurs in 12 to 15 years following a final harvest in even-aged treatments.

As noted in the Affected Environment section, the East Side project area contains both MA 2.0 and 3.0. Whereas MA 2.0 areas focus on uneven-aged management, MA 3.0 focuses on even-aged management with uneven-aged management an option on inclusions, riparian areas, wet soil, or visually sensitive areas. For visuals, 446 acres, 245 acres, 365 acres and 298 acres (Alternatives 1, 2, 3, and 4 respectively) were considered in the development of uneven-aged management options. For more discussion on

visually sensitive areas relating to the development of uneven-aged management options, please consult the vegetation section discussion and Table 58 through Table 65.

Thinnings (even-aged management) and selection cuts (uneven-aged management) reduce crowding, remove dead and dying trees, and lessen visual contrast. However, with thinnings and selection harvests, an overstory is maintained in the stand, and therefore, generally do not require vegetative buffers to meet VQOs.

As a consequence of harvesting, the volume of the dead and downed wood will increase and will affect the scenic integrity as will the number and height of slash piles. Mitigation measures are included to reduce the height of slash piles or pull back or scatter slash in the foreground along sensitive trails and roads. Leaf-off harvest also reduces the visual contrast of dried, dead leaves. Please refer to the Mitigation Appendix for stands having these measures.

Table 94. Visual Mitigation in Blocks Exceeding 40 Acres

Block ID	East Side Treatment Acres (Alt 1& 3)	Existing Acres 0-10 yrs old	Total Acres	VQO met without Mitigation		
				Alt 1/3	Alt 2	Alt 4
1	41	0	41	No	No	No
2	114	38	152	No**	No**	No**
3	96	15	111	Yes	Yes	Yes
4	45	0	45	Yes	Yes	Yes
5	46	40	94	Yes	Yes	Yes
6	22	63*	85	Yes	Yes	Yes
7	66	0	66	No	No	No
8	11	50*	61	Yes	Yes	Yes
9	18	32	50	Yes	Yes	Yes
10	16	31	47	Yes	Yes	Yes
11	34	38	72	No	No	No
12	47	23	70	Yes	Yes	Yes
13	40	9	49	Yes	Yes	Yes
14	49	0	49	Yes	Yes	Yes
15	27	21	48	No	Yes	No
16	32	14	46	Yes	Yes	Yes
17	41	7	48	Yes	Yes	Yes
18	67	8	75	Yes	Yes	Yes
19	52	32	84	Yes	Yes	Yes
20	56	45*	101	Yes	Yes	Yes
21	80	32	112	Yes	Yes	Yes
22	41	0	41	No	No	No

* ***Acres shown represent a total of several stands less than 40 acres in size, and not adjoining each other. The East Side harvest unit creates a temporary opening of the size indicated in Total Acres.***

** ***Area would not meet VQO with mitigation.***

Additional measures that assist reforestation and the natural regeneration of trees include herbicide, fencing, fertilization, site preparation, and planting. The visual impact of herbicide is short-term, becoming less noticeable after each season and lasting no longer than three years (Forest Plan, p.15). Fencing minimizes deer browse, impacts the area for 7 to 10 years, and is removed when no longer needed. The woven, aluminum wire fence with a clearing around the perimeter is noticeable only in a limited number of foreground conditions. The long term benefit of fencing is a more quickly, re-established, natural appearing forest with healthy green trees of varied species. Site preparation involves the removal of beech and striped maple that occur in the understory and hinder seedling development. These species provide some screening but rarely reach the dominate or co-dominate status in a forest. Planting occurs in existing open areas where insufficient seedlings are present. When plants become established, this vegetation provides additional variety and screening.

Alternative 1

This alternative represents a combination of salvage and green harvest treatments. Salvage harvesting removes most of the visual contrast of the dead and dying timber. Some dead and dying trees are left as snags for wildlife habitat. The Visual Quality Objective is maximum modification in most areas and standard mitigation is adequate to meet visual quality along the corridors that require it. In other locations where the VQO is more restrictive, mitigation will include the layout of a vegetative buffer or designing the boundaries so that the openings (new 0-10 year vegetation) are more natural in appearance and blend with the surrounding forest canopy.

Approximately 489 acres of activity are located along SL1 and 2 roads and trails. These require mitigation measures such as the application of slash disposal guidelines, seasonal restrictions for harvesting trees, and location of landings away from the view facility. Many of the 126 acres that are adjacent to SL1 roads will also require a vegetative buffer or boundary adjustments. Some of these acres have extensive mortality and currently do not meet Visual Quality Objectives; some are not expected to meet VQOs even with mitigation. However, long term, regeneration and reforestation measures are included with this alternative which will establish canopy for these areas to eventually meet VQOs.

This alternative provides the opportunity to reforest an area that has been altered by mortality using even-aged, regeneration harvests. After a final harvest, initially, the low scenic value of the stand would improve within a year as the ground "greened up" with additional small seedlings. As the seedling stage transitioned and grew to sapling stage, the scenic value would decrease again. This is due to the fact that vegetation in this stage of development is dense and thick, thus obstructing visual penetration into the stand. As the stand transitioned to pole-size (after 15 years), the scenic value will begin to recover as a canopy begins to develop. Over time, as the stand matures and visual penetration increases, the scenic value will also increase. (Hoffman & Palmer, 1996, p. 21)

Reforestation measures included with this alternative provide for the growth of a new forest by incorporating planting, site preparation, fencing, and herbicide. The benefits from these reforestation activities include an improved scenic integrity and a restored visual condition.

Alternative 2

Fifty percent of the stands proposed for treatment in this alternative would receive a salvage only thinning treatment. There are no "temporary" openings (new 0-10 year vegetation) created from timber harvesting in this alternative. Most areas fall within the VQO of maximum modification. Thinning removes the visual contrast of the dead and dying timber. Mitigation, such as slash treatment and leaf-off harvest, minimize the short term effects of harvesting along SL1 and 2 roads and trails. The remaining fifty

percent of the stands not treated have light to moderate mortality. In these light mortality areas, the visual contrast of the dead and dying trees will remain.

This alternative proposes no reforestation activities. Without reforestation activities, the appearance of the treated area will be that of a savanna which includes a carpet of fern and grass and few trees. These areas may eventually become reforested but over a much longer period of time. In areas where the understory is fern and grass, it is possible that reforestation would not occur. Therefore, areas with the most severe mortality may not meet VQOs even in the long term, especially areas exceeding 40 acres.

Alternative 3

This alternative is similar to Alternative 1, except that Alternative 3 contains no new road construction or reconstruction-betterment activities. Consequently, it represents a lower combination of salvage/green harvesting and/or reforestation treatments as displayed in Alternative 1. In the areas of low stocking and no transportation access, there is no harvesting. However, reforestation occurs on 242 of these acres. Salvage harvesting, which removes the visual contrast of the dead and dying timber, will occur on 4,219 acres in areas of the most severe mortality. Snags will remain for wildlife habitat.

The Visual Quality Objective is maximum modification in most areas, and standard mitigation is adequate to meet visual quality along the corridors where it is required. Approximately 463 acres in total are located along SL1 and 2 roads and trails and require mitigation measures. These include the application of slash disposal guidelines, seasonal restrictions for harvesting trees, and the location of landings away from the view facility. Many of the 126 acres that are adjacent to SL 1 roads will require a vegetative buffer or boundary adjustments to reflect a more natural appearance to blend with the surrounding forest canopy. Some of these acres have extensive mortality and currently do not meet VQOs; some are not expected to meet VQOs even with mitigation.

This alternative provides the opportunity to reforest the area that has been altered by mortality. The same effects regarding scenic value as discussed under Alternative 1 are also applicable for Alternative 3. Regeneration and reforestation measures are included so that long term, a canopy is established to meet VQO in the future.

Alternative 4

Alternative 4 considers mostly uneven-aged management proposals. The goal of uneven age treatment is to maintain a continuous forest canopy with trees of varying sizes. Uneven-age management occurs on 2,863 acres, salvage thinning on 2,473 acres, and reforestation on 630 acres. There are no “temporary” openings (new 0-10 year vegetation) created from harvesting with this alternative. Some small openings in the canopy are present where mortality is light to moderate. Larger openings would occur where mortality is severe (1,986 acres). Salvage thinning removes the visual contrast of the dead and dying timber. Reforestation methods such as planting and herbicide application are prescribed to provide for new forest growth. However, experience has indicated that the reforestation success rate would be lower than what would typically be found with even-aged regeneration techniques.

In areas where mortality is most severe (1,986 acres), the result of uneven-aged management on these areas may be a sparse overstory with fresh, lush growth of fern and grass, beech brush, or slowly developing tree seedlings that will give a savanna-like appearance in the years that follow. Where mortality is lower, it will appear savanna-like but with more trees. These areas may eventually become reforested but over a much longer period of time. It is likely that the standing dead trees will continue to

impact and lessen the scenic integrity. Some of these areas have difficulty meeting the visual quality standards as noted previously.

Alternative 5 - No Action

Approximately 25 percent of the project area has severe mortality, 50 percent has light to moderate mortality, and 25 percent falls into the realm of what would normally be expected in terms of dead and dying trees in a forested stand. In mortality areas, the visual contrast of the dead and dying trees will remain and a loss of scenic integrity will occur progressively over time. In some cases, this condition may lower the standard of the visual quality on the forest and cause some sensitive travelways to fall below visual quality standards.

At least 126 acres along Sensitivity Level 1 corridors have extensive mortality. These acres may eventually appear savanna-like and may eventually become reforested but over a much longer period of time. It is also likely that the standing dead trees will continue to impact and lessen the scenic integrity. Some of these areas have difficulty meeting visual quality standards since they expand areas greater than 40 acres either alone or in combination with recent harvests (existing 0-10 year vegetation) in adjacent stands. Where this occurs, there is no mitigation applied. Scenic Integrity will remain lowered causing some sensitive travelways to fall below visual quality standards.

Cumulative Effects

The area of analysis includes the sensitive travel corridors within the project area and the areas immediately adjacent to them. A travelway is viewed as it is traveled in sections, yet it remains part of the whole. Impacts in one section of a corridor will impact the quality of the experience of those who travel the whole corridor. Scenic Integrity has been and will continue to be impacted by a number of factors; some of them are within our control and some are not. These factors include actions of the past such as the 1986-1998 ANF treatments, existing conditions of the present along sensitive travel ways, and treatments proposed in the future. Among future effects are those represented in the East Side alternatives, as well as those proposed during the timeframe considered in cumulative effects (2019). These generally are all within our control and responsibility.

The standard practice is to maintain Visual Quality Objectives on the ANF. The Forest Plan has outlined the desired future condition that maintains visual quality on Forest Service land. This knowledge of the desired condition guides the choices that are made and protects the land from the cumulative effects as projects are proposed in the future. In addition, visual monitoring is conducted on a random basis every five years to insure our practices are in line with our Forest Plan. In 99% of the cases, monitoring has demonstrated that the visual standards have equaled or exceeded desired future conditions (USDA-FS 1998a).

The Forest Plan and CFRs generally place size limits on final harvests (i.e., restricts acres of harvest), allowing a maximum of 40 acres (Forest Plan, p. 4-87). Mitigation measures such as buffers are designed to protect views into the forested landscape. In other cases, time is spent naturalizing an opening by thinning areas adjacent to a dense forest to create a more natural appearing opening that better blends into the forest canopy. Naturalizing the edges with thinning and/or grouping plantings in the foreground are some techniques applied along sensitive corridors. These techniques give a natural appearing, forested condition to an otherwise second growth or previously cut forest.

Visual quality of private lands is not within our control, however, some predictions can be made. It is predicted that 4% (687 acres) of the 16,982 acres of private forest land will have a final harvest and 10%

(1,779 acres) will have thinning over the next 20 years. Development can be interspersed with Forest Service land and can interrupt a sensitive (SL1 or SL2) forested travelway. Impacts of OGM development, because of their subsurface rights, can affect a sensitive visual corridor even on federal lands. Impacts can be in the form of roads that intersect travelways and are designed for the maximum sight distance of large tank trucks or the placement of tank batteries adjacent to roads with little or no vegetative buffer. Future Forest Service projects within the cumulative effects timeframe (2019) would strive to meet the Visual Quality Objectives by design, modification, or mitigation measures.

Summary of Mitigation Measures and Effectiveness

Mitigation measures by stand for each alternative are found within Appendix D.

The most common mitigation to achieve the VQO in a travelway that is of high concern is in the use of vegetative buffer treatments. These "special treatment areas" can range from 1/4 acre leave areas along a travelway, to a 100-or 200-foot "no cut" zone along a corridor, to a buffer designed by a landscape architect who incorporates leave areas and openings that are location specific. These treatments can maintain the VQO in normal circumstances when the existing condition is one of dealing with healthy trees. In cases where the existing condition is one of extreme mortality and the VQO is currently not met, the goal changes to minimizing the impacts in a way that appears natural. This can be accomplished by using buffer treatments in combination with reforestation. This accelerates the process of bringing healthy trees back into the landscape and fits MA 3.0 objectives.

Mitigation measures to reduce visual contrast include locating landings off travel ways, slash disposal, and leaf-off harvest. **Location of landings** is important due to the visual contrast between a large clearing and the forest and the degree of activity and disturbance this activity creates. **Slash disposal** guidelines reduce visual contrast in the foreground along roads and trails with a sensitivity level of 1 or 2. This is achieved by pulling back slash 25 feet and lopping and scattering the slash to a 3 foot depth for an additional 75 feet. Along trails opened seasonally (Snowmobile, Allegheny Snowmobile Loop-ASL, ATV and the Knox-Kane Railroad), slash will be pulled back 15 feet from the edge of open roads and trails and will be lopped and scattered to a 3 foot depth for an additional 35 feet. **Leaf-off harvest,** when practiced, reduces the visual contrast of dried, dead leaves attached to branches with only the branches remaining to break down and decompose on their own.

Other mitigation that is standard practice along sensitive roads and trails include facing the marking paint away from the travel way and clearing, seeding, and mulching landings. These measures also reduce contrast in visually sensitive foreground situations.

Previous monitoring has demonstrated that applying mitigation measures in visually sensitive corridors on the ANF is effective in dealing with short-term effects (USDA-FS 1998a, p 58-60). Measures such as leaf-off harvest and slash treatment are helpful to reduce the visual impact of slash and other ground disturbance. They provide a level of visual quality during the 1 to 3 years it takes for slash to decompose and other ground disturbance to be reseeded or heal over naturally (Hoffman and Palmer, 1996, p 8-10). This mitigation is very effective in the climate of NW Pennsylvania which is characterized by rain and high humidity. These natural agents act as a catalyst to break down remains of the harvest and provide nutrients to the soil.

Mitigation can also help with long-term effects that might be evident for 3 to 20 years. A vegetative buffer with ¼-acre clumps left in the foreground will naturalize an opening by creating variety in the landscape. This natural appearing landscape character may be effective for as many as 20 years, the time it takes for young trees to begin a new forest. In some cases, altering the treatment type, the size and shape, or leaving the area alone may be another form of mitigation.

Economics

Jobs and income in Warren, Forest, Elk, and McKean Counties are affected by activities on the ANF through direct employment as well as products and services that are generated from activities on National Forest system lands. Priced commodities (revenues) from the East Side project would be timber sale receipts. The impact of oil and gas development with the project area to the local economy is through private employment/income since subsurface rights are reserved and outstanding. The main non-priced services include dispersed recreation opportunities such as hunting, fishing, hiking, wildlife viewing, etc. Twenty-five percent (25%) of the actual revenues generated forest-wide on National Forest system lands are retuned to the four counties to be used to support roads and schools.

Recreation is a major activity on the ANF. A wide range of settings is available for recreation from areas that are semi-primitive to those that are motorized and highly developed. Many areas across the ANF receive very low use indicating that the supply of places to recreate exceeds the demand. Most recreation use across the ANF occurs at developed recreation sites such as campgrounds and boat launches. The nature of dispersed recreation is that it is flexible and is based on the needs of the user and the resources of a piece of land at a given time. The recreationist has an opportunity to choose and enjoy a wide variety of recreation experiences on the ANF – an opportunity not duplicated on many other public lands. Non-local recreation users of the project area contribute to the local economy as they pass through or stay overnight in the area.

Affected Environment

This section establishes baseline information for those elements of the existing environment that have been or will be affected economically by the mortality and the proposed treatments.

Chapter 1 of this document identified seven "needs for action" to move the existing condition of the East Side project area towards the desired future condition as described in the Forest Plan. As described in the background section of Chapter 1, the East Side project area has many stands that are no longer in a healthy and productive state and are not capable of meeting long-term Forest Plan objectives. The opportunity and need exists to initiate reforestation prescriptions that will restore these stands to a healthy condition and to salvage dead and dying trees within many of these stands.

The length of time dead trees hold their value or merchantability varies by tree species. Also, larger diameter trees retain their merchantability longer than smaller diameter trees. Black cherry must be harvested within three to four years of its death to be appraised and sold as sawtimber. White woods (ash, maple, birch, and beech) must be harvested within 8 to 12 months of their death to be appraised and sold as sawtimber. If salvaged within three to six months of their death, white woods should retain about 70 percent of their value. After six months and up to one year, ash will retain about 60 percent of its value while the remaining white wood species will most likely retain only 25-30 percent of their original value due to quality losses from stain and boring insects. After one year from their death, but before two years, white woods are marketable as pulpwood, or perhaps as construction grade lumber. Beyond two years, they can be considered only for firewood salvage.

In addition, while the sugar maple borer will cause little direct mortality, it will have an adverse impact on the grade of the tree causing a direct reduction in value. There will also be a significant grade loss from trees experiencing dieback (where limbs or branches have died as the result of stresses). If dieback involves only the major branches of a tree, then decay will take longer to reach the bole and any grade loss may be due largely to fungal staining. The vegetation section in this document and the vegetation

report (Appendix B) provide additional details regarding salvage sale merchantability standards, marketability, and products.

The average 1996 to 1999 values for green and recently dead volume from the various species are as follows:

Black Cherry Sawtimber	$1,614.53/MBF
Dead Black Cherry	$500.00/MBF
Ash Sawtimber	$278.89/MBF
Sugar Maple Sawtimber	$224.54/MBF
Red Maple Sawtimber	$159.98/MBF
Yellow Poplar Sawtimber	$139.72/MBF
Beech Sawtimber	$28.78/MBF
Other Hardwood Sawtimber	$46.23/MBF
Conifer Sawtimber	$25.45/MBF
Hardwood Pulpwood (live & recently dead)	$4.74/cord or $9.48/MBF
Conifer pulpwood	$3.07/cord or $6.13/MBF

Management proposed affects the flow of timber products (sawtimber and pulpwood) into the marketplace. All of the dead and dying (high risk) trees evaluated in this analysis are part of the growing stock volume used to calculate the allowable sale quantity (ASQ) for the Forest Plan. The ANF continues to experience the strong demand for sawtimber volume described in the Forest Plan Appendix B (USDA-FS 1986c, p. B-80). The demand for pulpwood has increased since 1986 when the Forest Plan was approved. Several new industries have been built that utilize this type of raw material.

Reforestation costs, road costs, wildlife habitat improvement costs, and other miscellaneous management costs have been considered during this analysis. The following are the average FY 99 costs for some of these activities on the ANF:

Fencing	$307.60/acre
Site Preparation	$130.95/acre
Fertilization	$221.01/acre
Herbicide	$197.05/acre
Release	$150.88/acre
Planting/Tree Shelters	$710.92/acre
Sale Preparation/Planning	$108.09/MBF *
Sale Administration	$24.01/MBF
Road Support	$5.60/MBF
Road Construction	$46,795/mile
Road Reconstruction	$32,089/mile
Wildlife Habitat Improvement	$301.35/acre

**** includes costs for planning, inventory, preparation, common services, and appeals/litigation.***

Table 95 and Table 96 present detailed species composition information for the "green" areas and for the "salvage" areas (where mortality is higher, as expected). This information provides a summary of data which 1.) serves as the basis for the economic calculations for volume harvested and volume lost for each alternative and 2.) supplements the forest type/dead tree discussion in the Vegetation section of this chapter. The average values shown were calculated from a large subsample of the stand data.

Information about potential harvest volume from dead and high-risk trees is shown in Table 95. Note that data in this table covers only the "salvage" areas and shows average basal area across all stand conditions for three categories of trees….dead trees, all trees currently projected to be alive, and all trees which are

expected to die. It includes a wide range of individual stand conditions since it includes close to 2,200 acres of stands where stocking of live healthy trees is at or below 40% relative density and close to 2,800 acres (those proposed for salvage thinning) which are moderately to well-stocked with live, healthy trees. As shown in Table 95, black cherry, sugar maple, red maple and beech compose the majority of dead and high-risk (dying) trees in the areas proposed for salvage. The last line in the table summarizes the species composition and basal area of the dead trees that could have been salvaged if the salvage had been more timely, and the second line summarizes the high-risk trees that would be harvested in the current proposal.

Table 95. Live, High-Risk, and Dead Trees in Salvage Areas (4,995 acres) - Average Basal Area by Species

Tree Category	Sugar Maple	Red Maple	American Beech	White Ash	Black Cherry	Other	Total BA
All Live Trees	14	32	10	2	41	11	110
High-Risk Trees	6	6	2	0	4	1	19
Dead Trees	6	3	2	1	2	1	15

The average species composition of the healthy trees on the 8,223 acres proposed for treatment is shown in Table 96. Average basal areas for "green" and "salvage" categories are displayed separately. Note the higher total basal area of healthy trees in the "green" areas than in "salvage" areas, as expected. Salvage areas reflect slightly lower average stocking in red maple, sugar maple, and black cherry. Healthy tree basal areas are much lower than average for these species in stands proposed for final harvest. Black cherry is a major component of both categories, meaning that average stand values are fairly high. Shifts in species composition caused by tree mortality and decline affect future economic values.

Table 96 also represents the average species composition that would remain in twenty years (or over the long-term) after trees die, barring any additional major natural catastrophic events (severe defoliation, drought, windstorm). As such, it presents the cumulative effect on tree species composition, of implementing Alternative 5 (where there is no harvesting or reforestation) or Alternative 2 (where there is salvage thinning of dead and declining trees but no final harvest or reforestation activities). The basal area value for the other species column in the green category is high, in part, because it contains a substantial amount of red pine.

Table 96. Current Average Species Composition (Basal Area) of Healthy Hardwood Trees Within the Areas Proposed for Treatment (8,223 acres)

Harvest Area Category	Sugar Maple	Red Maple	American Beech	White Ash	Black Cherry	Other	Total
Salvage (4,995acres)	8	27	9	1	37	9	91
Green (3,228 acres)	11	36	8	1	41	44	141

Environmental Consequences

Direct/Indirect Effects

Many of the actions proposed in this analysis are in reaction to natural events. They are driven by tree mortality and decline. Other actions are standard practices proposed under normal (green) conditions. Both are designed to help achieve Forest Plan objectives and outcomes to the extent possible given the circumstances. The economic factors dealt with in this analysis relate to 1.) the value of timber harvested and foregone and 2.) the costs associated with sale preparation/harvest, reforestation, wildlife habitat improvement, and other resource improvements. These issues are best dealt with in a simple cash flow analysis. Table 97 displays the key economic values included in this cash flow analysis and are items which can readily be measured. Many of the values generated by the various alternatives involve goods and services that are not priced in the market place, such as the value of a hunting experience or watching wildlife, and thus, are not represented in this comparison. The figures used are planning numbers and use the best "averages" available. The actual value of the selected alternative will not be known until the project is implemented. Actual market conditions will determine the real value or cost at the time of the sale. Because of the two to three-year delay in implementing this project, most of the dead trees no longer have salvageable harvest volume. For purposes of this economic analysis, we have assumed any dead trees originally inventoried, with the exception of black cherry, no longer have any salvageable economic value.

Any time resource management practices are performed, there are direct benefits and costs associated with them. A review of the data indicates that the differences in cash flow between alternatives are primarily dependent on the volume of sawtimber harvested, project planning costs, the amount of reforestation work (as indicated by reforestation costs), road costs, and the value of the timber foregone from harvest. Of these, the first two economic variables play the largest role in defining cash flow differences between alternatives.

Alternative 1 has the highest volume of sawtimber harvested, followed by Alternative 3 that harvests about 68% of that in Alternative 1. Alternative 4 harvests about 25 percent of the Alternative 1 sawtimber amount, followed by Alternative 2 harvest at only 13 percent. This same relative ranking between alternatives holds true for project planning costs, which are tied directly to harvest volumes.

Concerning reforestation costs, Alternative 1 has the highest costs, followed closely by Alternative 3. Alternative 4 reforestation costs are 53% of those in Alternative 1, but it yields only 20% of the Alternative 1 sawtimber volume, contributing to the strongly negative cash flow. There are no reforestation costs associated with Alternatives 2 and 5 since they both call for letting nature take its course in reforesting the landscape.

Road construction and reconstruction work are scheduled in all alternatives, except Alternative 5, to facilitate removal of forest products. These activities have some environmental effects associated with them as well as economic costs. (Road activity amounts by alternative are displayed in Chapter 2). The economic costs have been included in this economic analysis (Table 97), and the effects are explained in the various resource sections. Alternatives 1 and 4 have the highest transportation costs ($4.6 million and $3.8 million respectively) in terms of road support, construction, and reconstruction costs. In Alternative 4, road costs are 83% of those in Alternative 1, but Alternative 4 yields only 25% of the Alternative 1 sawtimber volume; roads are another contributor to the strongly negative cash flow in Alternative 4. Alternative 2 focuses only on salvaging timber, therefore, transportation needs and associated costs ($3.3 million) are less than in Alternatives 1 and 4. Alternative 3, in response to the issues, proposes no new construction or reconstruction (betterment) activities. This alternative has the least cost ($3.0 million) associated with the transportation needs of any of the action alternatives (Alternatives 1 through 4).

Table 97. Summary of Key Economic Values

Key Economic Variables	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Cash Flow					
Costs					
Sale Planning, Prep, Harvest Admin.	$8,480,688	$749,668	$5,641,991	$1,650,457	$521,192[1]
Road Construction	$711,284	$388,399	0	$467,950	0
Wildlife Habitat Improvement	$327,444	0	$327,444	$327,444	0
Road Decommissioning	$18,000	$13,000	$5,000	$13,000	0
Road Support/Reconstruction	$3,873,260	$2,948,670	$3,021,292	$3,278,866	0
Reforestation costs	$2,762,409	0	$2,386,640	$1,455,433	0
Longer Skidding	0	0	$5,001	0	0
Total Costs	$16,173,085	$4,099,737	$11,387,368	$7,193,150	$521,192
Total Revenues	$18,473,086	$1,880,088	$13,106,122	$3,784,738	$ 0
Net Cash Flow (Total Revenue-Total Cost)	**$ 2,300,001**	**$-2,219,648**	**$1,718,754**	**$-3,408,412**	**$-521,192**
Volumes By Time Of Harvest [2]					
Sawtimber "NOW" volume (MBF)	13,364	3,565	8,237	6,990	0
Sawtimber "LATER" volume (MBF)	14,589	0	10,903	0	0
Total Sawtimber Volume (MBF)	27,953	3,565	19,140	6,990	0
Pulpwood "NOW" volume (MBF) [3]	20,414	2,110	11,801	5,504	0
Pulpwood "LATER" volume (MBF) [3]	15,589	0	11,769	0	0
Total Pulpwood Volume (MBF) [3]	36,246	2,110	23,570	5,504	0
Total Harvest Volume (MBF) (Total Sawtimber + Total Pulpwood)	**64,199**	**5,675**	**42,710**	**12,494**	**0**
Timber Foregone					
Sawtimber Volume Foregone (MBF)	-3,216	-3,943	-4,226	-2,699	-7,514
Pulpwood Volume Foregone (MBF) [3]	-6,402	-6,997	-7,693	-4,600	-9,105
Total Volume Foregone (MBF)	-9,618	-10,940	-11,919	-7,299	-16,619
Value Of Timber Foregone	**$-970,271**	**$-1,299,887**	**$-1,479,618**	**$-1,251,828**	**$-3,186,872**

[1] *Includes only costs for planning, vegetation examination, appeals & litigation, common services, etc.*

[2] *"Now" harvests occur within the next year or two. "Later" harvests occur approximately three to ten years from now.*

[3] *Volumes shown for pulpwood are MBF equivalents. There are approximately two cords of pulpwood per one MBF.*

Table 97 shows the value and volume of timber foregone in each alternative. This term (foregone) refers to the amount of additional timber that could have been harvested but was not. The primary reason for foregoing timber harvest volume or value in this project relates to whether dead or dying trees are harvested. Timber values foregone are highest in Alternative 5 ($3.2 million), since there is no harvest, followed by Alternative 3 (1.5 million), then Alternatives 2 and 4 ($1.3 million). Timber values foregone are lowest in Alternative 1 ($1.0 million). Basically this analysis tells us that the cost of the long delay between the time the trees died and the time they would be salvaged results in close to a $1 million loss, consisting of close to 6.4 million board feet of pulpwood volume and 3.2 million board feet of sawtimber volume. As the delay time increases, or if no harvest occurs, volumes and value lost move closer to the

$3.1 million (9.1 million board feet of pulpwood and 7.5 million board feet of sawtimber) reflected in Alternative 5.

Alternatives 1 and 3 are the only alternatives with positive net cash flows ($2.3 million and $1.7 million, respectively), and they rank highest for net cash flow because the high sawtimber values offset the costs of key activities, including reforestation, road work, and project planning/administration. Alternative 1 has a slightly higher cash flow than Alternative 3 primarily because harvest activity occurs on almost all areas where reforestation investments are made and increased harvest returns more than offset increased road costs. In Alternative 3, some areas are deferred from harvest because neither new road construction nor reconstruction (betterment) are permitted.

Alternatives 2, 4, and 5 all have negative net cash flows. Alternative 5 (no action), with a negative $0.5 million cash flow, has little activity except project planning, appeals/litigation, and common services. From a cash flow standpoint, this alternative loses much less money than Alternatives 2 and 4. Alternative 2, with a negative $2.2 million cash flow, has high planning costs and relatively low sawtimber volume harvested. Alternative 4 (uneven-aged management) has the highest negative cash flow (-$3.4 million) of all the alternatives due to high reforestation costs and low sawtimber harvest volumes. This is typical for uneven-aged management on the Allegheny Plateau due to the high investment required and relatively low returns. Local managers must pay particular attention to deer browsing pressure on developing tree seedlings and to the stocking of ground vegetation which interferes with tree seedling and other herbaceous plant development and growth (Stout in Marquis 1994b, p 334). Over the long term, cash flows for uneven-aged management would become even more negative, as lower value, shade-tolerant tree species replace high value species (black cherry) which thrive under the current even-aged conditions.

In addition to affecting the timber resource, the current mortality situation will have a negative economic effect on recreation by virtue of the additional costs associated with felling hazardous trees along roads, trails, and near dispersed and developed recreation sites. These costs have not been calculated nor included in this analysis. The main economic effect on wildlife of the current mortality is the cost of re-establishing suitable habitat conditions through plantings (mainly conifers and shrubs) and other re-vegetation treatments. Costs for these activities have been included in this analysis.

Cumulative Effects

Cumulative effects on economics for the East Side project area will be evaluated by considering both ANF land and private land. ANF considerations will include the 8,223 acres of treatments proposed in the East Side project as well as other past, present, and reasonably foreseeable future actions within the 139,990 acres of National Forest land within the project area. Activities projected to occur on 28,195 acres of private land will also be considered. Additional details can be found in the cumulative effects discussion for vegetation. Table 78 summarizes treatments that have occurred or are anticipated to occur. Projections cover the period from 1986 through 2019 and are based on the assumption that future projects would implement Forest Plan objectives to the extent authorized by the most recent Biological Opinion (USDI-FWS 1999).

Timber harvesting likely in the project area during the 1986-2019 time period ranges from 18% to 19% for final harvest, 4% to 6% for selection harvest, 26% to 27% for green thinnings, and 5% to 6% for salvage thinnings (Table 78). On a proportional basis (according to land area), these projections for final harvest and thinning are well below those projected for the ANF in the Forest Plan EIS (USDA-FS 1986, Table 4-9 Ch 4 p 18, Tables 4-10 and 4-11 Ch 4 p 28). The Forest Plan did not forecast the amount of salvage thinning which might occur, since salvage thinning is a response to unforeseen natural events. However, adding both salvage thinning and green thinning together (31% to 33%) still results in

substantially less total thinning than anticipated in the Forest Plan. The projection for selection harvest exceeds the amount anticipated in the Forest Plan. In summary, projected harvest levels through 2019 for the East Side project area are well below Forest Plan levels for all alternatives, consistent with trends reported in the ANF FY 1998 Monitoring and Evaluation Report (USDA-FS 2000a, pp 2-3 & 6). This indicates cumulative economic returns from harvesting, including returns to the treasury and payments to local government, would be lower than anticipated in the Forest Plan (USDA-FS 1986c, Table B-64), adjusting for inflation, unless the decrease in harvest volume would be offset by increased economic efficiency or higher stumpage values (which may be occurring as indicated by the discussion in the following paragraph).

According to the FY 1997 Timber Sale Information Reporting System Report, the present net value of the ANF timber sale program (57.6 MMBF harvested) is about $11.2 million (that is $19.9 million in benefits, at a cost of about $8.3 million). The program also generated about 779 jobs in the local economy (exceeds the 485 jobs projected in the Forest Plan Appendix B, Table B-22 on p B-108), provided about $48.5 million in total income to area residents, and supplied about $7.3 million in tax revenues to local government through the Twenty-five Percent Fund and payments in lieu of taxes. Timber values continue to increase on the ANF. A timber sale offered in 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 $1,491.65 per tree. The previous high of $2,225 had occurred in 1997.

For a variety of reasons, including the generally poorer condition and distribution of the seed source and the higher density and size/abundance of interfering plants, reforesting areas affected by substantial mortality and decline can be much more expensive than reforesting areas not affected. Under more normal conditions, forest managers generally would have more options or would need fewer activities to help ensure reforestation success. Cash flows, therefore, are generally lower in “salvage” than in “green” situations. The cumulative effect of all of the activities anticipated in Alternatives 1, 3, and 4 yields a lower cash flow than would be realized under more normal conditions. For the period 1986 through 2019, considering harvest levels indicated above, the total cash flow realized from the project area would be similarly reduced. Further reductions in cumulative returns would occur if substantial additional tree mortality/decline develops between now and 2019. Reforestation practices in Alternatives 1 and 3, since they are designed to maintain moderately to well stocked forest cover, help limit cash flow reduction over the long-term, but are less successful at limiting this reduction in Alternative 4. Since reforestation practices are not part of Alternatives 2 and 5 management, the cumulative effect would be a larger reduction in long-term cash flow than would be experienced with Alternatives 1 or 3.

Management prescribed in each alternative can be expected to impact the local economy, including local jobs…contractors who purchase timber and primary and secondary wood processors hire local people who harvest, haul, and process timber and who spend money in local businesses. Local employment also supports the needs of people coming into the area to hunt, fish, and to enjoy other recreation activities. These impacts were assessed in the Forest Plan EIS for each of the alternatives (Alternatives A through E) analyzed in detail (USDA-FS 1986, Ch 4 p120-122; USDA-FS 1986c, pp B-106 to B-112). On a proportional basis (according to land area), the cumulative effect on the local economy of East Side Alternatives 2, 4, and 5 management over time would come closest to that of Forest Plan Alternative A (which was not selected), whereas Alternatives 1 and 3 management would most closely approach the effects shown from Forest Plan Alternative D (the selected alternative).

Summary of Mitigation Measures and Effectiveness

No Mitigation measures have been identified for economics.

Human Health And Safety

Affected Environment

Humans use most of the forested areas covered in this analysis. Most of that use is scattered, very intermittent and of short duration. The types of human uses or activity include camping, hiking, hunting, fishing, wildlife observation, timber harvesting, reforestation activities, and oil and gas extraction activity. The following discussion summarizes from a human health and safety standpoint the existing condition of the areas proposed for treatment.

A number of the areas affected by severe tree mortality and decline border roads, recreation trails, or other dispersed recreation sites. Over time, those dead and dying trees will deteriorate and become vulnerable to wind stress or other natural forces that could cause them to fall over. Dead, dying, and falling trees are a natural part of the life cycle of the forest. ANF users should be aware of and expect an increasing level of risk associated with this natural phenomenon. Naturally, there is a hazard to people when trees fall if people happen to be in the vicinity. In some areas, concentrations of dead trees are already beginning to pose a substantial safety risk to forest users. Dead trees along roadways may lean toward the road opening and fall in that direction; may fall after vibration or turbulent air resulting from passing traffic; or may fall toward roadways during windstorms, depending upon the direction of the prevailing wind at the time. Once on the road surface, fallen trees can also be a hazard to fast-moving traffic. Workers or volunteers who stop to remove them are also at risk.

There are other inherent risks people will encounter when using the ANF. The dense understories of herbaceous woody plants that develop under partial canopies can also create safety hazards. The vegetation section of this document describes the condition of the understory vegetation within the treatment areas. The dense herbaceous cover in many areas conceals downed logs, rocks, holes and other tripping and bruising risks. Blackberry bushes can scratch, tear clothing, and cause an allergic reaction in some people. Dense beech saplings have small dead twigs and sharp buds that can cause eye injury.

A number of sites proposed for logging, reforestation, and herbicide treatment are within the Ridgway watershed. Surface water runoff from this watershed flows into Big Mill Creek, the main stream flowing into the Ridgway Reservoir (located five miles downstream from the closest treatment area), which is a source of domestic water for the town of Ridgway. A map showing the sites proposed for treatment within the Ridgway Watershed can be found in the East Side EIS Map Set on the Section H map for each Alternative. The Index Map for Section H contains Map ID numbers which correspond with the Map ID numbers for each stand in Appendix B, Table 23. The project file contains a more detailed map showing the location of the herbicide treatments within the watershed.

Numerous dispersed recreation sites and trails exist within the project area as noted in the recreation discussion. During the summer months, recreation use is especially heavy on the weekends.

Some privately-owned lands adjoin areas where herbicide treatment is proposed. Recreation residences (at Seldom Seen and Camp 9, for example) exist within the project area and are used on a seasonal basis. These are under long-term permit from the Forest Service. No East Side project herbicide treatments are proposed adjacent to or nearby recreational residences. There are approximately 30 areas proposed for herbicide treatment where there is a private seasonal-use cabin or residence within 1,000 feet.

Oil, gas, and mineral (OGM) development and extraction activity is occurring at numerous locations within the project area. Developers range from large companies to independent operators, various subcontractors, and field workers engaged in drilling, construction, well completion, and well tending.

Almost all of the OGM developments within the project area are privately owned and operated under reserved or outstanding rights where the U. S. Government owns only the surface rights. These areas contain access roads, electric lines and oil or gas pipelines that are either buried or above ground, pump jacks, collection tanks, and other miscellaneous equipment. People working at or traveling to these facilities and the associated equipment are exposed to the hazards from falling dead or declining trees.

Environmental Consequences

Direct/Indirect Effects

The risk falling live and dead trees pose to human safety always exists in a forest setting. High winds and wet shallow soils often cause healthy, live trees to topple. Furthermore, some dead trees are purposely left standing for wildlife (woodpeckers, Indiana bat roosting, kestrels, etc.), and additional trees will no doubt die after salvage operations are completed.

For the project area, overall risks to human safety associated with standing dead trees and falling trees are reduced as the acreage of trees harvested increases. Alternative 1 proposes 7,987 acres of harvest; Alternative 2 proposes 4,219 acres; Alternative 3 proposes 5,321 acres; and Alternative 4 proposes 5,336 acres. Alternative 5, No Action, proposes no harvest associated with this project. There are two categories of hazard: 1.) standing dead trees along trails and roads and near heavily used dispersed recreation areas pose the greatest safety risk, and 2.) dead trees in the general forest area pose a risk mainly to hunters, oil and gas developers, and loggers in those areas where a harvest treatment is implemented.

For category 1, Alternative 5 poses the most risk to human safety by allowing all dead trees to remain standing, particularly from those along roads and in areas frequently used by the public. Alternatives 1, 2, 3, and 4 pose much lower risks than Alternative 5, and they are very similar to each other. Each of these would include non-commercial cutting of hazardous trees in selected high use areas, as the need arises, in order to reduce risks from them.

For category 2, the risk to human safety for those people using the general forest area increases as the amount of cutting decreases. The risk to the public from the actual harvest activity is considered to be low in all alternatives. Harvest areas will be marked, loggers will be present at the site when activity is occurring, and the activity is noisy, all of which provide ample warning to anyone who happens to venture nearby. For loggers, the risk to them increases as the level of harvest increases.

Herbicides have been used to control interfering vegetation on selected sites within the project area since 1987. No adverse effects on human health and safety have been noted. Most of the areas proposed for treatment in the current project would be treated with a combination of glyphosate and sulfometuron methyl.

Potential impacts from using glyphosate or sulfometuron methyl to control interfering plants have been examined in detail in the Understory Vegetation Management EIS (USDA-FS 1991) (see Chapter 4 and the human health risk analysis in Appendix A of that document). That information was considered in the site specific analysis completed for this project. Numerous mitigation measures included with this project plus additional measures outlined in the USDA-FS 1991 (Chapter 5) help ensure that potential effects of this project on human health and safety will be minimal. They are equally effective in all alternatives.

Public contact with the pesticides or residues is expected to be minimal. Spraying notification signs will be posted along roads or trails or at other locations where there is easy access to a treatment area (mitigation measure VE1). They will alert people that these areas have been or will be treated so they can stay out of the area if they choose to do so. Areas adjoining trails would not be treated from Friday through Sunday when trail use is highest (Mitigation Measure R11). However, even if someone does contact pesticide residue or the spray mist in a treatment area, the risk to human health is negligible (USDA-FS 1991, pp. 4-8 to 4-12).

Alternatives 2 and 5 have no planned herbicide spraying, and the amounts treated in Alternatives 1, 3, and 4 range from 3,487 acres (Alt. 1) to 2,983 acres (Alt. 4). Vegetation and environmental conditions on the areas proposed for treatment are within the range of conditions considered in the ANF FEIS for Understory Vegetation Management. Adjacent landowners and owners of recreation residences will be notified of the proposed spray activity in all alternatives, and signs would be posted so people have the opportunity to stay out of the areas if they choose to do so (see Mitigation Measure # VE2 and the Mitigation Appendix section). However, no effects are expected even if they enter the areas soon after or during treatment (USDA-FS 1991, pp. 4-8 to p. 4-10, Appendix A, pp. 5-4 to 5-17). During the past ten years, this mitigation has been effective.

Table 98 summarizes, by alternative, the acres proposed for activity within the Ridgway Watershed (Big Mill Creek watershed). Within the areas proposed for treatment in the Ridgway Watershed, the minimum distance from herbicide treatment area boundaries to perennial flowing water is 75 feet, pursuant to the Forest Plan (Forest Plan, p. 4-25). Many areas, due to their location, actually exceed 75 feet. There are six locations where the herbicide blocks total more than 40 acres. The treatment areas represent 3% of the portion of the watershed that is within the ANF boundary.

Table 98. Acres Proposed for Treatment within the Ridgway Watershed

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Final Harvest	463	0	463	0	0
Herbicide Treatment	435	0	435	421	0
Thinning/Selection Harvest	22	409	22	410	0

This type of potential impact was evaluated in the ANF Understory Vegetation Management EIS (USDA-FS 1991; Chapter 4, pp. 6-10; Appendix A, pp. 4-8 to 4-12 and 5-5 to 5-8). Conditions on the Ridgway Watershed sites are within the range of conditions evaluated. Standard operating practices for the herbicide program (USDA-FS 1991, pp. 5-2 to 5-4), particularly the buffer strip requirements in the Forest Plan (Forest Plan, p. 4-25), would adequately protect water quality. Local monitoring has shown these buffer strips to be effective. As a conservative measure, application will be staggered to avoid treating any more than 40 contiguous acres in one year (Mitigation Measure VE6, Appendix D).

Water testing conducted in 1987 and 1988 outside of the Ridgway Watershed showed no detectable levels of herbicide downstream from treatment areas (USDA-FS 1991, p. 4-4). More recent monitoring work in 1998 and 1999 of treatments conducted on powerline rights-of-way has shown the same results. In 1999, for example, water samples collected downstream from a right-of-way treatment contained no detectable herbicide with buffer strips as narrow as 13 feet for cut stem treatment (with glyphosate) or 58 feet for low volume foliar treatment (unpublished). In 1998, monitoring of herbicide treatment on a powerline right-of-way within the Ridgway Watershed showed that with a 600-foot buffer strip there were no detectable levels of herbicide in water samples collected downstream (Norris, 1998).

No other areas proposed for herbicide treatment are within watersheds used to provide potable water supplies for human consumption. None of the proposed herbicide treatment sites are close to (i.e., within 100 feet) water wells or springs used for domestic consumption. In summary, no impacts are expected to water quality of domestic or public water supplies within the project area or near sites proposed for herbicide treatment. The risk is negligible for herbicides to contaminate ground water or surface water that is used as a public water supply.

One effect of logging and herbicide treatment on mineral resources or to the people involved in such activities arises from the potential for associated equipment to rupture oil and gas pipelines; this is caused by operating the skidders or the vehicle containing the spray equipment in areas where pipelines and powerlines occur. Another potential effect would be from the potential exposure of mineral development personnel to herbicides. Alternatives 1 through 4 propose varying amounts of treatment in these kinds of areas.

Loggers and mineral developers will be notified of planned activities (Mitigation Measure VE2, Appendix D). Close coordination with them, careful operation of logging and spraying equipment, and identification of facilities to be protected (Mitigation Measure VE5, Appendix D) has historically produced and will continue to yield minimal impacts on mineral developments and negligible risks to associated employees. Vegetation and environmental conditions on the areas proposed for treatment are within the range of conditions considered in the ANF Environmental Impact Statement for Understory Vegetation Management. Therefore, the risks to mineral development workers from the proposed use of glyphosate and sulfometuron methyl are negligible (USDA-FS 1991, pp. 4-8 to p. 4-10, Appendix A, pp. 5-4 to 5-17).

Falling dead trees can severely disrupt oil and gas production by damaging storage tanks or control valves, rupturing surface pipelines, interrupting electric service, or damaging pump jacks. The potential for this to occur decreases as the amount of harvesting increases. Alternative 1 harvests the most (7,978 acres) and Alternative 2 the least (4,219 acres), except for Alternative 5 where there is no harvesting.

Cumulative Effects

Cumulative effects on human health and safety will be evaluated for the entire project area by considering both ANF land (139,990 acres) and private land (28,195 acres). ANF considerations will include the 8,223 acres of treatments proposed in the East Side project as well as other past, present, and reasonably foreseeable future actions. Activities on private land will also be considered to the extent they can be predicted. Additional details can be found in the cumulative effects discussion for vegetation. Table 78 summarizes treatments that have occurred or are anticipated to occur. Projections cover the period from 1986 through 2019.

Much of the private land within the project area is owned by individuals, although some large areas are owned and managed by private companies for timber production, oil and gas production, or other commercial ventures. Vegetation management activities occur on a substantial portion of this private land. Small, scattered communities, permanent residences and seasonal-use cabins are located on some of these private landholdings. People use many of the seasonal-use cabins during the Fall when hunting and during the Spring when fishing.

The cumulative risk to the public from all of the harvest activity likely to occur within the project area is expected to be low. The cumulative effect of salvage harvesting conducted in response to periodic occurrences of tree mortality/decline is a decrease in the risk of someone being hit by a falling tree in the general forest area. Similarly, there would be a cumulative reduction in risk from falling trees for oil and

gas developers and their equipment/facilities. For loggers, the cumulative risks to them increase as they conduct more harvest activity.

Herbicide treatment likely during the 1986-2019 time period ranges from 18% to 21% of the ANF portion of the project area (Table 78). The amount of treatment anticipated on private land is difficult to predict, but we expect it would be less than the 1,374 acres of expected final harvest (less than 5% of the total amount of private land). On a proportional basis, projected herbicide treatment is less than projected in the Forest Plan EIS (USDA-FS 1986, Table 4-14 Ch 4 p. 38). Conditions within the East Side project area are within the range of conditions considered in the ANF FEIS for Understory Vegetation Management (USDA-FS 1991). Cumulative effects to human health are not likely to occur because none of the herbicides are persistent in the environment or in the human body (USDA-FS 1991, Ch 4 p. 21 and Appendix A Section 5 p. 15, Ch 2 pp 6-8, Ch 4 pp 1-5).

Since 1998, herbicides have also been used selectively within the project area on powerline rights-of-way to control tall growing vegetation which has the potential to interfere with safe, efficient, and effective operation of these facilities. Treatment is scattered throughout and is limited to the rights-of-way (USDA-FS 1997c, Ch 4 p. 103). None of the herbicides are persistent in the environment or the human body (USDA-FS 1997c, Summary p. 10 and Appendix A p. 108). The human health risk analysis for that project showed risks to human health would be minimal to non-existent (USDA-FS 1997c, Ch 4 p. 101). These rights-of-way would not be treated as part of the East Side project. There would be no cumulative effect on human health and safety from these treatments and the treatments proposed as part of the East Side project.

Summary of Mitigation Measures and Effectiveness

Seven specific herbicide mitigation measures (R11, VE1 through VE6 in Appendix D) plus additional measures outlined in the UVM FEIS (USDA-FS 1991), particularly those listed in the Health and Safety subsection (Chapter 5 p 3), help ensure the potential effects of this project on human health and safety would be minimal. Measures include when herbicide application will be permitted, notification as to where application will occur, and the use of buffer strips to protect water quality. Substantial discussion regarding these measures has been included in the preceeding discussion of direct and indirect effects. Site-specific analysis prompted application of them to individual stands (Appendix D).

The ANF has been implementing these mitigation measures for the last 12 years. Based on experience and site-specific monitoring, these measures have maintained water quality and, therefore, no significant adverse effects are expected from the proposed herbicide application under any action alternative. For additional information regarding effectiveness and monitoring results, see the discussion which follows Table 98.

CHAPTER 4 INDEX

A

Abandoned Wells....129
Access 7, 38, 49, 50, 72, 106, 108, 110, 120, 121, 235, 246, 263
Acid Levels....75
Adaptive Management ..7, 15, 23, 26, 155, 156, 157, 163, 176
Aesthetics....52
Age Class .4, 63, 133, 140, 142, 143, 147, 152, 156, 161, 173, 174, 176, 180, 183, 184, 245
Allegheny Hardwood....4, 6, 31, 140, 141, 143, 145, 147, 153, 154, 163, 166, 171, 172, 247
Allegheny River 75, 81, 230, 231, 232, 234
Allowable Sale Quantity....256
Alternative 1…13, 19, 20, 21, 22, 23, 26, 30, 33, 34, 45, 49, 50, 52, 53, 65, 66, 67, 69, 70, 89, 90, 91, 100, 120, 122, 152, 153, 154, 155, 157, 160, 163, 168, 171, 172, 173, 174, 175, 183, 206, 208, 209, 210, 211, 212, 217, 219, 220, 221, 222, 223, 241, 242, 244, 245, 251, 252, 258, 260, 263, 265
Alternative 2...22, 23, 45, 47, 50, 65, 66, 67, 69, 70, 88, 98, 149, 155, 157, 172, 206, 209, 210, 211, 213, 214, 215, 218, 219, 220, 221, 222, 223, 240, 241, 242, 243, 245, 251, 257, 258, 260, 263, 265
Alternative 3...23, 24, 25, 38, 45, 50, 52, 65, 66, 68, 69, 70, 85, 121, 122, 152, 153, 154, 155, 160, 163, 168, 172, 173, 174, 175, 176, 206, 208, 209, 210, 211, 212, 218, 219, 220, 222, 240, 241, 242, 252, 258, 259, 260, 263
Alternative 4 .26, 27, 28, 45, 49, 50, 65, 66, 70, 123, 148, 154, 155, 156, 159, 160, 163, 165, 167, 168, 172, 174, 175, 177, 178, 206, 208, 209, 210, 211, 212, 215, 220, 241, 243, 245, 252, 258, 259, 260, 261, 263
Alternative 5...13, 28, 33, 35, 45, 49, 50, 51, 64, 65, 84, 87, 88, 89, 90, 91, 92, 93, 102, 120, 122, 128, 149, 154, 167, 168, 169, 172, 183, 185, 206, 215, 219, 220, 221, 223, 228, 240, 241, 242, 243, 244, 245, 253, 257, 258, 259, 260, 263, 265
Alternatives.....13, 18, 64, 65, 66, 67, 68, 69, 70, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 104, 105, 106, 109, 120, 121, 122, 126, 129, 240, 242, 243, 245, 249, 253, 258, 259, 260, 261, 263, 264, 265
American Woodcock....194
Aquatic... ..59, 74, 75, 76, 78, 79, 80, 81, 82, 84, 85, 105, 164, 200, 210, 220
Archaeology....230
Archaic Period....230
Artifacts....231
Aspen ...…8, 21, 25, 28, 44, 58, 132, 141, 187, 188, 189, 193, 194, 195, 200, 204, 213, 220

B

Bacillus Thuringiensis....133
Background....248
Bald Eagle....228
Barred Owl 193, 198, 219
Basal Area....26, 256, 257
Beaver 200, 220
Beech Scale....35, 36, 139, 151, 170
Best Management Practices....105
Betterment 17, 21, 22, 27, 38, 43, 50, 67, 68, 69, 71, 72, 85, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 121, 122, 123, 124, 125, 126, 127, 240, 242, 245, 252, 258, 260
Biodiversity....138, 140, 149, 203
Biological Assessment 51, 148, 187, 199, 220
Biological Environment 50, 130
Biological Opinion....12, 56, 126, 228, 260
Black-Throated Blue Warbler 198
Black-Throated Green Warbler ...190, 198, 199, 208, 219, 220
Brook Trout 201
Browsing 6, 50, 64, 65, 66, 130, 131, 133, 138, 144, 152, 153, 154, 156, 161, 164, 166, 167, 169, 185, 187, 210, 214, 260
Buffer Areas....236
Buffer Strips 83, 264, 266
Buffering Capability....75
Buffers....83, 249, 253

C

Camping 78, 233, 238, 239, 243, 262
Canopy .50, 52, 59, 79, 83, 138, 139, 140, 144, 146, 152, 154, 160, 161, 162, 170, 175, 176, 178, 191, 192, 198, 199, 209, 211, 213, 220, 223, 228, 234, 242, 248, 251, 252, 253
Carbon....63, 64, 65, 66, 70
Cash Flow Analysis....44, 47, 52, 258, 260
Catch Basins 21, 25, 28, 44
Cavity Nesting....193, 199
Certification Of Regeneration In Final Harvest Areas 132
Civilian Conservation Corps 234
Clearcut 20, 43, 150, 154, 158, 179, 180
Coarse Woody Debris 187, 191
Comments 8, 9, 10, 13, 32
Commercial Thinning 16, 20, 24
Comparison Of Alternatives....40, 42, 48

Composition.....2, 6, 13, 55, 63, 131, 135, 138, 139, 140, 143, 149, 151, 153, 155, 163, 164, 166, 171, 180, 186, 187, 195, 202, 203, 211, 212, 226
Conifer .3, 4, 5, 21, 25, 28, 36, 40, 41, 44, 130, 139, 141, 147, 153, 164, 187, 188, 189, 190, 192, 193, 194, 195, 197, 198, 203, 204, 210, 211, 212, 213, 214, 215, 218, 219, 221, 222, 256
Connected Actions 122
Connectivity..... 203
Conservation Period..... 234
Conservative Measure..... 264
Continuous Crown Canopy..... 247
Costs.....256, 258, 259, 260
Create/Manage Upland Opening..... 132

D

Dead And Dying Trees . 6, 13, 22, 26, 29, 47, 50, 64, 65, 242, 248, 250, 251, 252, 253, 255, 259, 262
Decline ..…1, 2, 6, 7, 8, 9, 13, 14, 15, 16, 18, 19, 23, 29, 50, 51, 249, 257, 258, 261, 262, 265
Decommissioning. 10, 17, 21, 22, 25, 27, 33, 35, 37, 43, 48, 49, 67, 69, 71, 84, 85, 89, 109, 120, 121, 242, 259
Deer 4, 6, 50, 130, 131, 138, 144, 148, 152, 156, 159, 161, 162, 166, 167, 169, 170, 192, 214, 218, 231, 232, 251
Defoliation.. .1, 6, 63, 133, 137, 151, 171, 177, 185, 257
Delayed Shelterwood Removal Cut 150
Desired Future Condition...1, 2, 3, 4, 5, 6, 8, 40, 253, 255
Developed Recreation.....239, 255, 260
Disabled Hunter Roads 239, 243, 246
Dispersed Camping 78, 239, 243
Dispersed Recreation.... ..4, 5, 78, 79, 238, 244, 248, 255, 260, 262, 263
Disturbance 2, 34, 130
Diversity.....170, 187, 191, 192, 193, 198, 199, 205, 211, 215, 223, 226
Drought .1, 6, 51, 130, 131, 133, 169, 171, 185, 257

E

Early Logging 233
Early Logging Period..... 232
Early Successional.. ... 147, 187, 190, 194, 195, 203, 205, 207, 208, 209, 215, 218, 226, 231, 240
Ecological Health..... 74
Ecological Landtypes..... 48, 57, 73
Ecological Mapping Units 57, 59
Economics.....70, 232, 255, 258
Ecosystem Health..... 164
Ecosystem/Landscape Diversity..... 139
Eliminated From Detailed Study.....13, 29, 35, 38
Even-Aged Final Harvest..... 132
Even-Aged Management 3, 4, 6, 47, 50, 140, 147, 151, 156, 159, 161, 163, 172, 175, 249
Even-Aged Regeneration Harvests 14, 20, 24, 33, 56, 252
Existing Condition...1, 2, 3, 4, 5, 8, 40, 41, 171, 227, 237, 240, 253, 254
Existing Roads.....84, 85, 86, 90, 106, 108, 120, 240

F

Fencing. …17, 21, 25, 28, 44, 46, 48, 64, 67, 69, 70, 71, 132, 150, 163, 166, 168, 179, 182, 207, 209, 210, 211, 213, 214, 240, 243, 244, 251, 256
Fertilization17, 43, 46, 48, 63, 64, 66, 67, 69, 70, 71, 132, 150, 165, 168, 179, 182, 207, 210, 211, 251, 256
Filter Strips 76, 83, 244
Fish..... 75, 78, 79, 80, 81, 82, 105
Fish Habitat.....79, 85
Fish Structures 21, 25, 28, 44
Fishing78, 79, 82, 233, 238, 239, 243, 255, 262, 265
Foreground..... 248, 249, 250, 251, 253, 254
Forest Plan .. 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 19, 23, 30, 31, 32, 33, 34, 37, 38, 39, 52, 55, 59, 62, 66, 72, 83, 84, 85, 106, 107, 108, 109, 121, 122, 123, 124, 125, 126, 127, 140, 142, 146, 147, 149, 151, 156, 157, 160, 164, 166, 172, 173, 175, 178, 180, 181, 183, 185, 190, 191, 193, 196, 202, 206, 210, 212, 214, 217, 220, 229, 235, 237, 238, 244, 246, 247, 249, 251, 253, 255, 256, 258, 260, 261, 264, 266
Forest Service Road System.....106, 108, 120, 122
Forest System Roads 239, 243
Forest Type .. 58, 140, 141, 146, 148, 170, 171, 172, 173, 185
Fragmentation.....106, 205, 219, 221, 223, 224, 227

G

Genetic Diversity..... 139, 227
Glyphosate..... 16, 66, 83, 263, 264, 265
Great Blue Heron.....192, 197, 218
Group Selection.20, 24, 42, 150, 158, 160, 162, 209

H

Habitat Diversity.....4
Harvest ..…131, 132, 150, 151, 155, 158, 162, 168, 179, 180, 182, 183
Harvest Treatments 241, 242, 243, 245
Harvest Volume..22, 23, 25, 28, 154, 256, 258, 259, 260, 261
Harvesting…...62, 64, 65, 66, 67, 70, 72, 73, 78, 79, 81, 106, 122, 244, 245

Healthy Trees.....65, 66
Hemlock-Beech Forest.....231
Herbicide.....9, 16, 20, 22, 24, 27, 32, 43, 46, 48, 64, 66, 67, 71, 83, 94, 132, 150, 163, 164, 165, 168, 179, 182, 183, 207, 209, 210, 217, 240, 246, 251, 252, 256, 262, 263, 264, 265, 266
Heritage Resource Sites.....233, 235, 236
Heritage Resources.....52, 230, 233, 235
High-Risk Trees.....256, 257
Human Health And Safety.....53, 262, 263, 265, 266
Human Occupation.....230
Hunting ..78, 79, 122, 233, 238, 239, 240, 241, 243, 244, 246, 255, 258, 262, 265

I

Indiana Bat.....228
Individual Tree Selection.....50, 150, 158, 160, 179
Insect Suppression.....132
Intensive Use Areas.....238
Interfering Plants133, 135, 138, 144, 145, 147, 155, 160, 161, 166, 174, 177, 178, 185, 261, 263
Intermediate Harvests.....16, 50
Intermediate Thinning.....132, 150, 158, 182
Intermittent Streams.....75, 84
Issues.....8, 12, 13, 164, 171, 205, 227

K

Kane Experimental Forest Treatments.....18, 43
Key Economic Variables.....259

L

Land Management Activities.....81, 86, 88, 90, 93
Landforms.....48, 58, 59, 62, 68, 72
Landscape 58, 59, 75, 139, 140, 152, 161, 183, 243, 245, 247, 248, 253, 254
Landscape Patterns.....202, 208, 221
Late Archaic Sites.....231
Late Successional Forest140, 180, 190, 191, 212, 218
Late Successional Forest/Old Growth.....146, 179
Limestone.35, 49, 68, 76, 78, 79, 80, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 110, 111, 112, 116, 119
Litigation.....2, 10, 256, 259, 260
Logging.....262, 265
Logging Railroads.....234
Long Skids.....21, 67, 68

M

Magnolia Warbler.....190, 198, 199, 219
Management Activities.....245, 249, 265
Management Areas... 2, 31, 106, 141, 143, 147, 148, 163, 165, 237, 240, 247, 249, 254
Management Indicator Species.....193, 199, 218
Mature Forest.....133, 245
MBF.....256, 259, 261
Merchantability.....255
Middle Ground.....248
Midstory.....138, 140, 146, 165, 167, 170, 171, 176, 177, 178, 185
Mineral Estates.....128
Mitigation Measures....56, 72, 83, 90, 105, 127, 129, 153, 176, 228, 235, 236, 242, 246, 248, 250, 251, 253, 254, 263, 266
Monitoring.55, 56, 70, 72, 73, 76, 83, 84, 105, 123, 247, 253, 254, 264, 266
Motorized Trail Riding.....81

N

National Register Of Historic Places.....235
Natural Regeneration.....251
Need For Action.....6
Need For The Proposal.....5, 35, 38
Needs And Opportunities.....5, 13
Nest Boxes.....21, 25, 28, 44
New Road Construction....10, 17, 21, 45, 47, 50, 67, 68, 69, 71, 85, 87, 88, 90, 91, 92, 93, 95, 96, 97, 98, 100, 101, 102, 103, 104, 105, 108, 109, 120, 121, 122, 123, 126, 240, 242, 246, 252, 258, 260
Nitrate.....63, 64, 67
No Action.28, 35, 38, 48, 49, 50, 51, 62, 64, 70, 71, 72, 84, 121, 128, 129, 169, 170, 240, 243, 245, 253, 263
No Logging.....34
Non-Commercial Cutting.....263
Non-Forested Habitat.....192, 195, 196, 214, 226
North Country Trail12, 238, 241, 242, 244, 246, 248
Northeastern Research Station.....3, 5, 18, 176
Northern Hardwood.....58, 247
Northern Long-Eared Bat.....228
Nutrient Cycling.....48, 63, 64, 66
Nutrients.....63, 64, 67, 70, 75

O

Oak-Hickory Forest.....231, 232
OGM.106, 107, 110, 111, 113, 114, 115, 116, 117, 118, 120, 121, 122, 126
Oil And Gas 58, 70, 72, 78, 79, 80, 81, 82, 128, 129
Oil Boom Period.....233
Oil, Gas, And Mineral.....49, 246, 254, 262
Old Growth……..4, 5, 32, 33, 34, 35, 40, 41, 51, 146, 147, 152, 170, 180, 190, 191, 196, 197, 204, 205, 212

Opportunities..3, 4, 6, 7, 33, 52, 169, 190, 212, 237, 240, 245, 246
Overstory Removal 245

P

Paleo-Indian Sites.....230
Payments In Lieu Of Taxes 261
Perennial 66, 75, 84, 264
Permanent Openings 3, 4, 5, 40, 41
Pesticides 264
PH.....75, 78, 81
Pileated Woodpecker 191, 196, 199, 218, 219
Pioneer Period 232
Pit Development... 21, 22, 25, 27, 43, 64, 69, 70, 71, 72, 128
Pit Expansion..... 21, 22, 25, 27, 43, 48, 69
Planting ..21, 25, 28, 36, 43, 44, 129, 132, 163, 164, 168, 179, 182, 195, 210, 211, 212, 213, 214, 215, 218, 251, 252, 253, 256
Potential Sediment Sources 78
Prehistoric Sites.....230
Prep Cut/Two-Aged 20, 24
Present Net Value 261
Productivity.....58, 64, 66, 67, 69, 108
Proposed Action.....1, 3, 8, 9, 10, 13, 19, 37
Proposed Activities12, 14, 19, 22, 23, 26, 35, 42, 49
Proposed Treatments.....74, 86, 87, 90, 105
Pruning.....132
Pulpwood.....255, 256, 259, 260
Purpose Of The Proposal 2

R

Railroad Logging Era.....233
Realignment….17, 21, 22, 27, 35, 37, 43, 45, 47, 68, 72, 109, 111, 112, 116, 117, 119, 120, 121, 123, 124, 125, 127
Reconstruction.....67, 69, 121, 122, 123, 124, 125, 126, 127
Recreation 33, 52, 54, 58, 78, 80, 82, 106, 107, 121, 237, 238, 245, 262
Recreation Areas 238, 239, 241
Recreation Facilities.....241, 244, 246
Recreation Opportunity Spectrum.....237, 240, 244
Red-Shouldered Hawks 196, 219
Reforestation.....54, 56, 65, 66, 67, 70, 71, 207, 208, 209, 212, 214, 215, 218, 223, 226, 228, 251, 252, 254, 258, 261, 262
Reforestation Activities....6, 52, 152, 172, 181, 252, 257
Reforestation Treatments...6, 7, 9, 16, 22, 23, 26, 29, 35, 46, 50, 132, 150, 168, 172, 240, 243
Reforestation Treatments Only..... 20, 24, 42
Regenerate 193, 249
Regeneration.....54, 63, 64, 65, 67, 68, 70, 249, 252
Regeneration Harvests.....7, 42, 50, 165, 207, 208, 249, 251
Relative Density.140, 144, 151, 152, 153, 154, 155, 156, 158, 161, 162, 167, 168, 171, 175, 185, 257
Release....17, 20, 21, 22, 24, 25, 27, 28, 43, 44, 132
Research Natural Area.....34, 142, 147, 204
Restoration.....17, 21, 25, 27, 37, 38, 39, 43, 45, 47, 68, 69, 71, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 121, 122, 123, 124, 125, 240, 245
Rights-Of-Way 128, 129, 264, 266
Riparian 10, 59, 62, 66, 72, 75, 80, 82, 84, 145, 147, 157, 158, 159, 187, 192, 193, 194, 196, 197, 198, 199, 200, 202, 203, 204, 210, 214, 217, 220, 221, 222, 229, 249
Risk 262, 263, 264, 265
Road Activity.....74, 86, 92, 95, 96, 108, 109, 122
Road Construction 37, 48, 49, 52, 56, 62, 64, 67, 68, 69, 70, 72, 85, 94, 120, 121, 122, 123, 124, 125, 126, 127, 128, 242
Road Density.....10, 46, 106, 121, 122, 126
Road Management.. ... 106, 108, 120, 121, 122, 123, 126, 127
Road Reconstruction 17, 84, 85, 107, 109, 123, 126, 127, 128, 246, 256, 258
Road Work..... 78, 94, 98
Roads 2, 7, 28, 35, 36, 37, 38, 49, 50, 68, 72, 76, 84, 106, 107, 108, 109, 120, 121, 122, 126, 127
Ruffed Grouse 192, 193, 194, 200, 221

S

Salvage . 6, 13, 20, 22, 23, 24, 26, 29, 30, 35, 36, 42, 50, 132, 138, 144, 149, 150, 151, 152, 153, 154, 155, 158, 160, 161, 162, 168, 170, 172, 175, 179, 182, 206, 207, 209, 218, 221, 243, 249, 251, 252, 255, 256, 257, 263
Salvage Brushing.....35, 36
Salvage Shelterwood Removal Cut 153
Salvage Thinning 16, 19, 20, 47, 132, 154, 155, 168, 179, 182, 243, 257, 260
Savanna 81, 252, 253
Sawtimber.....234, 240, 255, 256, 258, 259, 260
Scenic Integrity.....241, 248, 250, 251, 253
Scenic Variety 248
Screening 248, 251
Seasonal Restrictions 127, 246
Second- Growth.....133
Sediment . .75, 76, 78, 79, 80, 81, 83, 84, 85, 86, 87, 88, 89, 90, 92, 93, 94, 95, 96, 97, 98, 99, 100, 104, 105
Sediment Control..... 75
Seeding.....21, 25, 28, 44, 67, 132, 213, 254
Selection Cutting 20, 30, 66, 132, 250

Sensitivity Level.239, 241, 243, 247, 248, 249, 251, 253
Shade-Tolerant Species..... 148, 162
Shelterwood Removal Cut 20, 24, 42, 150, 152, 153, 158, 243
Shelterwood Removal Cut (Delay) 15, 20
Shelterwood Seed Cut..... 15, 20, 24, 42, 64, 66, 122, 132, 150, 152, 153, 158, 181, 182, 249
Site Preparation.....210, 211, 220, 251, 256
Site Preparation (Striped Maple Cutting) 132, 150
Site Preparation For Natural Regeneration.. 132, 150, 163, 167, 168, 179
Slash.....243, 246, 251, 254
Small-Mouth Bass.....201
Social Environment..... 52
Soils...48, 57, 58, 59, 61, 62, 64, 66, 67, 72, 73, 159
Species Composition.....140, 256, 257
Species Diversity.....138
Standards And Guidelines .. 62, 64, 75, 83, 123, 244, 246
Standing Dead Trees/Snags 176
State Water Quality Standards..... 75
Stone Pits10, 21, 22, 68, 69, 128, 129, 242, 243, 246
Stream Morphology 105
Streams..58, 59, 64, 66, 74, 75, 76, 78, 79, 80, 81, 82, 84, 85, 87, 88, 89, 90, 94, 97, 98
Structure.....132, 171, 184
Subsurface Rights.....128, 246, 254, 255
Sulfometuron Methyl.....16, 66, 83, 263, 265
Surface Disturbance..... 48, 62, 67, 69, 70
System Roads 89, 92, 106, 120, 121, 122, 126

T

Temporary Openings.....251, 252, 253
Temporary Road.....17, 68
Temporary Road/Long Skid.....21, 22, 25, 27
Thinning.....235, 243, 250, 251, 252, 253, 254
Third Party Rights.....128
Threatened, Endangered, And Sensitive Species.187, 205, 214, 228
Timber Management 240, 241, 244, 245
Timber Rattlesnake 197, 219, 228
Timber Sale Information Reporting System Report 261
Timber Values.....255, 258, 259, 260, 261
Traffic Service Level..... 17, 67, 106, 109
Trail Construction.....238
Trail Maintenance 242
Trails62, 66, 67, 68, 72, 73, 75, 106, 107, 108, 237, 238, 241, 242, 243, 245, 246, 247, 248, 250, 251, 252, 254, 260, 262, 263, 264
Transition Cutting 20, 24, 42, 150, 158, 160, 162
Transportation System.....1, 7, 49, 72, 106, 126
Treatment Areas 143, 144, 145, 146, 165, 167
Tree Composition.....140
Tree Mortality.....258
Tree Planting.....150
Turbidity 84
Twenty-Five Percent Fund 261
Two-Age Prep 132, 150, 158, 182
Two-Aged 20, 24, 42, 132, 150, 155, 156, 158, 179, 182

U

UEAM 147, 148, 156, 157, 159, 160, 163
Understory.130, 135, 137, 138, 140, 142, 144, 146, 147, 148, 149, 152, 153, 155, 161, 164, 165, 169, 170, 171, 174, 176, 177, 180, 185, 251, 252
Uneven-Aged Management.....10, 11, 15, 20, 26, 28, 30, 31, 32, 47, 50, 66, 132, 140, 147, 148, 156, 157, 159, 160, 161, 163, 166, 167, 168, 172, 174, 175, 176, 243, 252, 260
Unique Plant Communities..... 140, 202

V

Vegetation.. 4, 29, 48, 50, 53, 55, 74, 130, 134, 135, 137, 145, 146, 149, 150, 164, 165, 176, 177, 178, 179, 182, 185, 206, 210, 263, 264, 265
Vegetation Management.....74, 122
Vegetation Restoration Treatments.....164
Vegetative Buffer.....249, 250, 251, 252, 254
Vegetative Composition.....242
Vegetative Treatments.19, 22, 23, 26, 87, 89, 92, 94
Visual Impact.....165, 246, 249, 254
Visual Quality.....246, 247, 248, 249, 254
Visual Quality Objectives...239, 247, 249, 250, 251, 252, 253, 254
Visually Sensitive.....10, 29, 147, 157, 158, 159

W

Walleye 201
Water..... 49
Water Holes.....21, 25, 28, 44, 213
Water Quality.53, 75, 78, 79, 80, 81, 82, 83, 85, 87, 105, 108, 200, 201, 220, 264, 265
Watershed 57, 58, 74, 75, 76, 78, 79, 80, 81, 82, 83, 84, 86, 87, 88, 89, 90, 91, 92, 93, 94, 97, 99, 100, 103, 105, 108, 248, 262, 264
Watershed Protection..... 34
Weeks Act.....128
Wet Soil 157, 158, 159
Wetlands 58, 59, 72
White-Tailed Deer..... 192, 195
Wild And Scenic River System.....234
Wilderness 239
Wildlife 1, 3, 5, 7, 10, 13, 20, 23, 24, 33, 41, 51, 58, 131, 132, 133, 139, 140, 142, 149, 152, 154, 155,

164, 166, 169, 171, 176, 178, 187, 188, 190, 191, 192, 193, 194, 195, 200, 202, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 217, 218, 219, 223, 224, 226, 227, 229, 234, 242, 256, 258, 260, 262, 263
Wildlife Habitat 1, 7, 13, 23, 58, 131, 133, 149, 154, 171, 205, 206, 211, 212, 219, 223, 224, 226, 227, 256, 258
Wildlife Habitat Community Types 189
Wildlife Habitat Improvement 132, 212
Wildlife Treatments 17, 21, 25, 28, 44, 213
Woodland Period 231
Woody Debris 75, 83

Y

Yellow-Bellied Sapsucker 199

Z

Zone Of Mortality 1, 18, 19, 22, 23, 26, 49, 75

CHAPTER 5 - REFERENCES

Adovasio, J.M, J.D. Gunn, J. Donahue, and R. Stuckenrath. 1977. Meadowcroft Rockshelter 1973-74: A Progress Report. Pennsylvania Archaeologist 45(3): 1-93.

Aldenderfer, M.S. and R. Dean. 1981. Cultural Resources Investigations of Compartments 45, 47, 72, 75, 137, 138, and 147 Allegheny National Forest Warren and Forest Counties, Pennsylvania. Contract NO. 53-56A1-0-00402. USDA Forest Service, Milwaukee, WI.

Alerich, C.L. 1993. Forest statistics for Pennsylvania -- 1978 and 1989. Resource Bull. NE-126. Radnor, PA. USDA-Forest Service. Northeastern Forest Experiment Station. 244 p.

Alexander, Earl B. and Roger Poff. 1985. Soil Disturbance and Compaction in Wildland Management; USDA-USFS Region 5, Earth Resources Monograph 8, January 1985; 159 p.

Allendorf, F.W. et al. 1983. *in* Hunter, Malcolm L. 1996. Fundamentals of Conservation Biology. Blackwell Science, Inc. Cambridge, MA.

Auchmoody, L.R. and Steele, S. S. 1974. *Unpublished*. Establishment Report - Affect of Aerial Fertilization on Regeneration Stocking and Development. Unpublished progress report on file at ANF Forest Headquarters, Warren, PA.

Barrett, John W. ed. 1995. Regional Silviculture of the United States. 3rd ed. John Wiley and Sons, Inc., New York, NY. 643 p.

Birdsey, R. A. 1996. Carbon storage for major forest types and regions in the conterminous United States. *In*: Sampson, R. N. and Hair, D., Eds. Forests and Global Change: Forest Management Opportunities for Mitigating Carbon Emissions (Vol. 2). Washington, DC: American Forests: 1-26.

Boldurian, A.T. and J.M. Adovasio. 1986. Who are Those Guys? An Examination of the Pre-Clovis Flintworking Complex From Meadowcroft Rockshelter and the Cross Creek Drainage. A Paper Presented at the Fifty-First Annual Meeting of the Society for American Archaeology, New Orleans, Louisiana.

Brais, Suzanne and C. Camire. 1997. Soil Compaction induced by careful logging in the claybelt region of northwestern Quebec (Canada); Canadian Journal of Soil Science; accepted 18 August 1997; pp. 197-206.

Brauning, D.W. 1992. Atlas of Breeding Birds in Pennsylvania. Univ. Pittsburgh Press. Pittsburgh, PA. 484 pp.

Casler, W.C. 1973. Logging Railroad Era of Lumbering in Pennsylvania, Vol. 11. Allegheny Valley Railroads. Lycoming Printing Company, Williamsport, PA.

Chambers, Carol L. et. al. 1995. Linking Reserve Areas: Using Animal Responses to Silvicultural Systems as Models for Management for Management. Corvallis, OR. pp. 9-17 *in* Sustainable Society and Protected Areas in Proceedings of the 8th Conference on Research and Resource Management in Parks and on Public Lands. April 17-21, 1995.

Christy, B.H. 1939. *In* Brauning, D.W. 1992. Atlas of Breeding Birds in Pennsylvania. Univ. Pittsburgh Press. Pittsburgh, PA.

Cowin, V.L. 1985. Western Pennsylvania: Appalachian Plateau and Lake Erie Shore The Woodland Periods pp 185-193, *in* A Comprehensive State Plan for the Conservation of Archaeological Resources Volume I. Pennsylvania Historical and Museum Commission. Historic Preservation Planning Series, Number 1.

Cummins, K. W., C.E. Cushing and G.W. Minshall. 1995. Introduction: An Overview of Stream Ecosystems. Ecosystems of the World-River and Stream Ecosystems. ELSEVIER. pp.1 - 8.

Curry, S., J. Kleissler, A. Clark, and Heartwood, Inc. v. U.S. Forest Service, M. P. Dombeck, R. T. Jacobs, and J. Palmer. 1997. Civil Action No. 97-1081. Memorandum and Order; October 15, 1997. Filed in the United States District Court for the Western District of Pennsylvania.

Dale, Martin E., H.C. Smith, J.N. Pearcy. 1995. Size of clearcut opening affects species composition, growth rate, and stand characteristics. USDA-FS. Research Paper NE-698. Radnor, PA: Northeastern Forest Experiment Station.

Davidson, Carlos. 1998. Issues in Measuring Landscape Fragmentation. Wildlife Society Bulletin, 26 (1): 32-37.

deCalesta, D.S. 1994. Effect of White-tailed Deer on Songbirds within Managed Forests in Pennsylvania. J. Wildl. Manage. 58: 711-718.

deCalesta, D.S. 1998. Affidavit of David S. deCalesta Regarding Civil Action No. 97-2187.

deCalesta, D.S. and L.D. Ordiway. 1999. Relative density and basal area: 3-dimensional estimators of forest canopy cover. Unpublished paper, 3/5/99. Forestry Sciences Laboratory, Northeastern Research Station, USDA Forest Service, Irvine, PA.

DeGraaf, R. M. 1987. Managing northern hardwoods for breeding birds. In: Nyland, Ralph D., ed. Managing northern hardwoods: Proceedings of a silviculture symposium: Misc. Pub. No. 13: Syracuse, NY. 1986 June 23-25; Syracuse, NY. State University of New York: 348-362.

DeGraaf, R.M., M.Y. Yamasaki, W.B. Leak, and J.W. Lanier. 1992. New England Wildlife: Management of Forested Habitats. NE Forest Experiment Station. Gen. Tech. Rpt. NE-144. Radnor, PA. 271 pp.

Delcourt, H.R. 1987. The Impact of Prehistoric Agriculture and Land Occupation on Natural Vegetation. Tree 2:39-44.

Delcourt, P.A. and H.R. Delcourt. 1997. Report of Paleoecological Investigations Cliff Palace Pond, Jackson County, Kentucky, in the Daniel Boone National Forest. 47 p. USDA Forest Service, Daniel Boone National Forest. Winchester, Kentucky.

DeVivo, M.S. 1990. Indian Use of Fire and Land Clearance in the Southern Appalachians. in Fire and the Environment: Ecological and Cultural Perspectives, 306-309. Southeastern Forest Experiment Station GTR-SE-69.

Drohan, Patrick, S. Stout, and G. Peterson. 1999. Spatial relationships between sugar maple (*Acer saccharum* Marsh), sugar maple decline, slope, aspect, and atmospheric deposition in Pennsylvania. In Horsley, Steven B.; Long, Robert P. Sugar Maple Ecology and Health: Proceedings of an International Symposium. Warren, PA: June 2-4, 1998. Radnor, PA: USDA-Forest Service, Northeastern Research Station, Gen. Tech. Rep. NE-261: 46-50.

Federal Register. 1996 (December 9). Water Quality Standards for Pennsylvania. Volume 61, Number 237, Rules and Regulations. pp. 64816-64822.

Froehlich, H. A., D.E. Aulerich and R. Curtis. 1981. Designing Skid Trail Systems to Reduce Soil Impacts from Tractive Logging Machines; Forest Research Lam, School of Forestry, Oregon State University; Research Paper 44, November 1981; 15 p.

Hallett, R.A; Bailey, S.W; Horsley, S.B; Long, R.P; Hall, T.J. 1999a. Foliar Chemistry of Sugar Maple: A Regional View *in* Sugar Maple Ecology and Health: Proceedings of an International Symposium, June 2-4, 1998, Warren, PA. Edited by SB Horsley and RP Long USDA For. Serv. Gen. Tech. Rep. NE-261 p. 66.

Hallett, R.A; Bailey, S.W; Horsely, S.B; Long, R.P; Hall, T.J. 1999b. Sugar Maple Nutrition and Health in the Northeastern United States. Ann. Meet. Abstr. Soil Sci. Soc. Am., p. 307.

Harmon, M. E; Ferrell, W. K; and Franklin, J. F. Effects on Carbon Storage of Conversion of Old-Growth Forests to Young Forests. *In:* Science; Volume 247, 9 February 1990, pp 699-702.

Hasse, R. 1984. Aquatic Biology Investigation, Windfall Run, McKean County. Pennsylvania Department of Environmental Protection, Meadville, PA. 8 pp.

Headwaters Charitable Trust. 1999. Crane Run Timbering Operations Proposed Best Management Practices, Aquatic Biological Survey-Preliminary Assessment, Crane Run, McKean Co., PA. Report on file at the Pennsylvania Fish and Boat Commission in Bellefonte, PA. 5 pp. (with appendices).

Hoffman, R. and J.F. Palmer. 1996. Silviculture and Forest Aesthetics within Stands. SUNY-ESF, Syracuse, NY.

Hoover, C. M., Birdsey, R. A., Heath, L. S., and Stout, S. L. 2000. How to estimate carbon sequestration on small forest tracts. Journal of Forestry 98(9): 13-19.

Horsley, S.B., and R.P. Long, eds. 1999. Sugar maple ecology and health: proceedings of an international symposium. 1998 June 204. Warren, PA. USDA-FS, Northeastern Research Station. Radnor, PA. Gen. Tech. Rep. NE-261. 120 p.

Horsley, S.B., R.P. Long, S.W. Bailey, R.A. Hallett, T.J. Hall. In press. Factors associated with the decline-disease of sugar maple on the Allegheny Plateau. Canadian Journal of Forest Research 30.

Horsley, S.B. and D.A. Marquis. 1983. Interference by Weeds and Deer with Allegheny Hardwood Reproduction. Can. J. of For. Res. 13:61-69.

Hoyt, S.F. 1957 *in* Brauning, D.W. 1992. Atlas of Breeding Birds in Pennsylvania. Univ. Pittsburgh Press. Pittsburgh, PA. 484 p.

Hunter, Malcolm L. 1990. Wildlife, Forests, and Forestry. Englewood Cliffs, NJ.

Hunter, Malcolm L. 1996. Fundamentals of Conservation Biology. Blackwell Science, Inc. Cambridge, MA.

Jones, S.B., deCalesta, D. and S.E. Chunko. 1993. Whitetails are Changing our Woodlands. Amer. For. Nov./Dec.: 20-25, 53-54.

Killham, Ken. 1996. Soil Ecology. Cambridge University Press. p. 89.

Kochenderfer, J.N., G.W. Wendel, and H.C. Smith. 1984. Cost of and Soil Loss on "Minimum-Standard Forest Truck Roads Constructed in the Central Appalachians. Res. Pap. NE-544, Broomall, PA. U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 8 pp.

Lantz, S.W. 1982. A Cultural Resource Survey of L.R. 93 (T.R. 62), Irvine Bridge, located near the town of Irvine, Warren County, Pennsylvania. Report submitted to Kozel Engineering Co., Inc. by the Division of Anthropology, The Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, 196 p.

Lantz, S.W. 1984. The Distribution of Paleo-Indian Projectile Points and Tools form Western Pennsylvania: Implications for Regional Distributions. pp 210-230, *in* Archaeology of Eastern North America, Vol. 12, 301 p.

Lantz, S.W. 1985. Western Pennsylvania: Appalachian Plateau and Lake Erie Shore Paleo-Indian Period pp 164-181, *in* A Comprehensive State Plan for the Conservation of Archaeological Resources Volume I. Pennsylvania Historical and Museum Commission. Historic Preservation Planning Series, Number 1.

Laurance, W.F., and Yensen. 1991. *In* Davidson, Carlos. 1998. Issues in Measuring Landscape Fragmentation. Wildlife Society Bulletin, 26 (1): 32-37.

Lehmkuhl, J.F., and L.F. Ruggiero. 1991. *In* Davidson, Carlos. 1998. Issues in Measuring Landscape Fragmentation. Wildlife Society Bulletin, 26 (1): 32-37.

Likens, G.E., C.T. Driscoll, D.C. Buso, T.G. Siccama, C.E. Johnson, G.M. Lovett, T.J. Fahey, W.A. Reiners, D.F. Ryan, C.W. Martin, S.W. Bailey. 1998. The biogeochemistry of calcium at Hubbard Brook. Biogeochemistry 41: 89-173.

Long, R.P., S.B. Horsley, and P.R. Lilja. 1997. Impact of forest liming on growth and crown vigor of sugar maple and associated hardwoods. Can. J. For. Res. 27:1560-1573.

Lynch, J.A., J.W. Grimm, K.S. Horner. 1998. Atmospheric deposition: spatial and temporal variations in Pennsylvania - 1997. University Park, PA: Environmental Resources Research Institute Publication ER9811.

Mackenzie, Martin and Robert Acciavatti. 1995. Another Perspective Towards Understanding the Forest Health Issue of Maple Decline and Mortality in the Allegheny National Forest. 13 p.

Manley, Patricia N. et al. 1995a. Sustaining Ecosystems - A Conceptual Framework, Version 1.0; USDA-FS Pacific Southwest Region and Station (R5), R5-EM-TP-001, April 1995; 216 pages; mainly pp. 8 - 32, 95 - 213.

Marcot, Bruce G. et al. 1992. Wildlife-Habitat Relationships; Concepts and Applications. Madison, WI. pp. 41-92.

Marks, P.L. 1974. The Role of Pin Cherry (Prunus pensylvanica L.) in the Maintenance of Stability in Northern Hardwood Ecosystems. *In*: Ecological Monographs (Winter 1974) Vol 44, No 1, pp 73-88.

Marquis, D.A. 1975. The Allegheny Hardwood Forests of Pennsylvania: Their Bounty of Timber and Deer are the Results of Events that Occurred Many Years Ago. USDA Forest Service General technical Report NE-15. 32 p.

Marquis, D.A. 1994. History and Origin of Allegheny Forests. *In* Quantitative Silviculture for Hardwood Forests of the Alleghenies. pp. 5-40 USDA Forest Service, Northern Forest Experiment Station. General Technical Report NE-183.

Marquis, D.A. ed. 1994b. Quantitative Silviculture for Hardwood Forests of the Alleghenies. Gen. Tech. Rep. NE-183. Radnor, PA: USDA Forest Service, NE Forest Experiment Station. 376 p.

Marquis, D.A., R.L. Ernst, S.L. Stout. 1992. Prescribing Silvicultural Treatments in Hardwood Stands of the Allegheny (Revised). Gen. Tech. Rep. NE-96. Radnor, PA: USDA-Forest Service. Northeastern Forest Experiment Station. 101 p.

Marquis, D.A. and R.L. Johnson. 1989. Silviculture of Eastern hardwoods. *In* The Scientific Basis for Silviculture and Management Decisions in the National Forest System. *Edited by* Russel M. Burns. USDA For. Serv. Gen Tech. Rep. WO-55. pp. 9-17.

Mcgarigal, K. 1993. *In* Davidson, Carlos. 1998. Issues in Measuring Landscape Fragmentation. Wildlife Society Bulletin, 26 (1): 32-37.

McNabb, W. H. and H. A. Froehlich. (after 1983). Conceptual Model For Predicting Forest Productivity Losses From Soil Compaction; after 1983.

McWilliams, W.H., R.L. White, S.L. Arner, C.A. Nowak, S.L. Stout. 1996. Characteristics of Declining Forest Stands on the Allegheny National Forest. Gen. Tech. Rep. NE-360. Radnor, PA: USDA-Forest Service. Northeastern Forest Experiment Station. 9 p.

McWilliams, W.H. 1999, June. Written correspondence to John E. Palmer, Forest Supervisor, Allegheny National Forest.

Miller, G.W., P.B. Wood, and J.V. Nichols. 1995. Two-Age Silviculture - An innovative Tool for Enhancing Species Diversity and Vertical Structure in Appalachian Hardwoods. Gen. Tech. Rep. RM-GTR-267. Fort Collins, CO: USDA-Forest Service. In Proceedings of the 1995 National Silviculture Workshop. Mescalero, NM. 6 p.

Miller, Gary W., J.E. Johnson, J.E. Baumgras, R.G. Bustamente. 1997. Two-age silviculture on the Monongahela National Forest - Managers and scientists assess 17 years of communication. In. U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. Proceedings of the National Silviculture Workshop: Communicating the role of silviculture in managing National Forests, Warren, PA. May 19-22, 1997. Radnor, PA: USDA-Forest Service, Northeastern Research Station. Gen. Tech. Rep. NE-238: 123-133.

Miller, N. 1973. Late-glacial and Postglacial Vegetation Change in Southwestern New York State. NY State Museum Bulletin 420. 102 p.

Moriarity, W.J., L.M. DeMarco, B. Nelson, T. Steffan, and B. Pence. 1996. "Draft Discussion Guide" - Riparian Ecosystem Management. USDA-FS-Allegheny National Forest. 74 p.

Munson, P.J. 1986. Hickory Silviculture: A Subsistence Revolution in the Prehistory of Eastern North America. *in* Emergent Horticultural Economies of the Eastern Woodlands. Southern Illinois University, Carbondale, IL.

Niemi, E. and E. Whitelaw. 1997. Assessing economic tradeoffs in forest management. Gen. Tech. Rep. PNW-GTR-403. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 78 p.

NOAA. 1995. Climatological data. National Oceanic and Atmospheric Administration, Environmental Data and Information Service, National Climatic Center, Asheville, NC.

Norris L. 1998. Water quality monitoring for herbicides in connection with vegetation management on electric utility rights-of-way on the Allegheny National Forest, 1998. Environmental Consultants, Inc., Stoughton, WI. 48 p.

Nowak, Christopher A. 1997. Long-term Sustainability: The Next Forest. *in* 1997 Penn State School of Forest Resources Issues Conference. Forest Sustainability: What's It All about? 1997, March 26-27. University Park, PA. pp. 82-88.

Nyland, Ralph D. 1998. Selection system in northern hardwoods. Journal of Forestry 96(7): 18-21.

Office of Technology Assessment. 1987. "Technologies to Maintain Biological Diversity." U.S. Government Printing Office, Washington, DC.

Oregon State University Extension Service. 1983. Designated Skid Trails Minimize Soil Compaction; Extension Circular 1110, February 1983; Corvallis, Oregon; 6 p.

Parker, A.C. 1968. Parker on the Iroquois. W.N. Fenton, ed. Syracuse University Press, Syracuse, NY.

Pennsylvania Department of Environmental Protection. 1989. Pennsylvania Gazeteer of Streams. Harrisburg, PA. 324 p.

Pennsylvania Department of Environmental Protection. 1994. Chapter 93. Title 25. Environmental Resources, Chapter 93. Water Quality Standards. Bureau of Water Quality Management, Harrisburg, PA. 212 p.

Pennsylvania Fish and Boat Commission. 1966. Little Mill Creek (Elk County) stream survey. Bellefonte, PA. 2 p.

Pennsylvania Fish and Boat Commission. 1986. Unpublished aquatic survey of West Branch Tununguant Creek, McKean County, PA.

Redding, J. 1995. History of Deer Population Trends and Forest Cutting on the Allegheny National Forest. *In* Proceedings of the 10th Central Hardwood Conference. *Edited by* K.W. Gottschalk and S.L.C. Fosbroke. USDA For. Srev. Gen. Tech. Rep. NE-197. pp. 214-224.

Ritchie,W.A. 1980. The Archaeology of New York State. Purple Mountain Press, Fleishmanns, New York. 358 p.

Ritchie, W.A. and R.E. Funk. 1973. Aboriginal Settlement Patterns in the Northeast. New York State Museum Memoir No. 20. University of the State of New York, Albany.

Robinson, Scott K. 1997. Effects of Different Kinds of Edges on Forest-Nesting Birds [abstract]. Session 19. Wildlife Society Annual Conference, September 1997. Where Do We Stand On Edges? Snowmass, CO.

Ross, P. 1996. Allegheny Oil: The Historic Petroleum Industry on the Allegheny National Forest. USDA Forest Service Eastern Region, Allegheny National Forest Heritage Publication No. 1. 96 p.

Ruffner, C.M., A. Sluyter, M.D. Abrams, C. Crothers, J. McLaughlin, R. Kandare. 1997. Assessing Native American disturbances in mixed-oak Forests of the Allegheny Plateau. *In* Proceedings, National Silviculture Workshop, 96-103. Warren, PA. USDA forest Service, NE Forest Experiment Station GTR-NE-238.

Smith, D.M. 1986. The Practice of Silviculture. 8th ed. John Wiley and Sons, New York, NY. 527 p.

Snow, D. 1994. The Iroquois. Blackwell Publishing, Cambridge.

Stuart, William B. and Jeffrey L. Carr. 1991. Harvesting Impacts on Steep Slopes in Virginia. (*In* Proceedings of the 8th Central Hardwood Conference; 1991 March 4-6; PA. Gen. Tech. Report NE-148; USDA-USFS, Northeastern Forest Experiment Station; pages 67-81.

Taber, T.T. III. 1974. Logging Railroad Era of Lumbering in Pennsylvania, Vol. 10. Tanbark, Alcohol, and Lumber. Lycoming Printing Company, Williamsport, PA.

Taber, T.T. III. 1975. Logging Era of Lumbering in Pennsylvania, Vol. 7. Sawmills Among the Derricks. Lycoming Printing Company, Williamsport, PA. 103 pp.

Thompson, Michael A., James A. Mattson, and Joseph B. Sturos. 1997. Methods Used to Evaluate the Effects of Forest Operations on the Remaining Vegetation and Soil: Review and Recommendations. *In* Proceedings: Forest Operations for Sustainable Forests and Healthy Economics; USDA Forest Service- South Dakota State University; July 28 - July 31, 1997; pages 62-75.

Tilghman, N.G. 1989. Impacts of the white-tailed Deer on Forest Regeneration in Northwestern Pennsylvania. J. Wildl. Manage. 53: 524-532.

Trieu P. 1999. Assessment of Physiochemical and Biological Effects of Two Types of Road Surface on Adjacent Roads. Masters Thesis, The Pennsylvania State University. 102 pp.

Urban, D.L. et al. 1987. *In* Chambers, Carol L. et. al. 1995. Linking Reserve Areas: Using Animal Responses to Silvicultural Systems as Models for Management for Management. Corvalis, OR. pp. 9-17 *in* Sustainable Society and Protected Areas in Proceedings of the 8th Conference on Research and Resource Management in Parks and on Public Lands. April 17-21, 1995.

USDA-FS. 1974. National Forest Landscape Management, Volume 2, Chapter 1, The Visual Management System (Big Eye Book).

USDA-FS. 1985. A Twenty-year History of Forest Insect and Disease Management on the Allegheny National Forest, Pennsylvania, 1965-1985. Forest Pest Mgmt., USDA-FS, Morgantown, WV. 19 p.

USDA-FS. 1985a. ROS Users Guide Eastern Region Supplement. 23 p.

USDA-FS. 1986. Allegheny National Forest Final Environmental Impact Statement Land and Resource Management Plan (FEIS), Warren, PA.

USDA-FS. 1986a. Allegheny National Forest Land and Resource Management Plan. Warren PA.

USDA-FS. 1986b. Allegheny National Forest Record of Decision Final Environmental Impact Statement Land and Resource Management Plan, Warren, PA.

USDA-FS. 1986c. Allegheny National Forest Appendix B Final Environmental Impact Statement Land and Resource Management Plan, Warren, PA.

USDA-FS. 1986d. 1986 ROS Book. 277 p.

USDA-FS. 1988. Allegheny National Forest Monitoring and Evaluation Report - Fiscal Year 1987. Warren, PA. 44 p.

USDA-FS. 1989. Allegheny National Forest Monitoring and Evaluation Report - Fiscal Year 1988. Warren, PA. 49 p.

USDA-FS. 1989a. Final Environmental Impact Statement, Vegetation Management in the Coastal Plain/Piedmont, Volume I. January 1989. Southern Region. Atlanta, GA.

USDA-FS. 1989b. Final Environmental Impact Statement, Vegetation Management in the Coastal Plain/Piedmont, Appendices, Volume II. January 1989. Southern Region. Atlanta, GA.

USDA-FS. 1990. Allegheny National Forest Monitoring and Evaluation Report - Fiscal Year 1989. Warren, PA. 47 p.

USDA-FS. 1991. Final Environmental Impact Statement Understory Vegetation Management on the Allegheny National Forest. Warren, PA.

USDA-FS. 1992. Summary of Responses to Project or IPS Appeal Points Relating to Herbicide Use - for Environmental Assessments completed August through November 1992. Allegheny National Forest.

USDA-FS. 1992a. Deer Management on the Allegheny National Forest. Unpublished report. 5 pp.

USDA-FS. 1994. Ecological Subregions of the United States: Section Descriptions. Washington DC. W. H. McNab and P. E. Avers; ECOMAP. July 1994.

USDA-FS. 1995. Shifts in Stocking Reveal Forest Health Problems. The Northeastern Forest Experiment Station, Radnor, PA. NA-TP-07-95. 9 p.

USDA-FS. 1995a. Analysis of Timber Harvest Program Capability. Allegheny National Forest. Warren, PA.

USDA-FS. 1995b. Environmental Assessment of Tree Mortality and Ecosystem Sustainability on the Allegheny National Forest. Warren PA. 70 p.

USDA-FS. 1995c. Landscape Aesthetics: A Handbook for Scenery Management.

USDA-FS. 1995d. Forest Health through Silviculture. Proceedings of the 1995 National Silviculture Workshop. Gen. Tech. Rpt. RM-GTR-267. Mescalero, NM. 246 p.

USDA-FS. 1995e. The Forest Service Program for Forest and Rangeland Resources: A Long-Term Plan. Draft RPA Program.

USDA-FS. 1996. Allegheny National Forest Annual Monitoring Report for Fiscal Year 1995. Warren, PA.

USDA-FS. 1997. Summary of Historical and Legal Context for Water/Road Interaction. San Dimas Technology and Development Center, San Dimas, California.

USDA-FS. 1997a. Allegheny National Forest Annual Monitoring Report for Fiscal Year 1996. Warren, PA.

USDA-FS. 1997b. Fisheries Amendment to the Allegheny National Forest, Land and Resource Management Plan. Warren, PA.

USDA-FS and Environmental Consultants Incorporated. 1997c. Allegheny National Forest Final Environmental Impact Statement *for* Vegetation Management on Electric Utility Rights-of-way, Warren, PA.

USDA-FS. 1998. Methods for Inventory and Environmental Risk Assessment of Road Drainage Crossings. San Dimas Technology and Development Center San Dimas, California.

USDA-FS. 1998a. Allegheny National Forest Monitoring and Evaluation Report - Fiscal Year 1997. Warren, PA. 91 p.

USDA-FS. 1998b. Biological Assessment For Threatened and Endangered Species on the ANF. 86 p.

USDA-FS. 1998c. Region 9-Riparian Area Definition and Management. FSM 2500 - Watershed Protection And Management R9 Supplement 2500-98-1; Chapter 20 - Watershed Protection And Management; Effective 10/21/1998; 3 p.

USDA-FS. 1998d. Recreation Use Report. Unpublished report (spreadsheet). Allegheny National Forest. 2 p.

USDA-FS. 2000. Final Environmental Impact Statement for Threatened and Endangered Species on the Allegheny National Forest. Allegheny National Forest. Warren, PA.

USDA-FS. 2000a. Allegheny National Forest Monitoring and Evaluation Report - Fiscal Year 1998. Warren, PA. 90 p.

USDA-FS. 2000b. Fisheries survey of Mud Lick Run, McKean Co, PA. Warren, PA.

USDA-NRCS. 1985. Soil Survey of Warren and Forest Counties, Pennsylvania.

USDA-NRCS. 1987. Soil Survey of McKean County, Pennsylvania.

USDA-NRCS. 1993. Soil Survey of Cameron and Elk Counties, Pennsylvania.

USDI-FWS. 1999. Biological Opinion on the Impacts of Forest Management and Other Activities to the Bald Eagle, Indiana Bat, Clubshell and Northern Riffleshell on the ANF. 91 p.

USDI-NPS. 1982. North Country National Scenic Trail Comprehensive Plan for Management and Use.

Van Dorp, D. and P.F.M. Opdam. 1987. *In* Davidson, Carlos. 1998. Issues in Measuring Landscape Fragmentation. Wildlife Society Bulletin, 26 (1): 32-37.

Vannote, R.L., G.W. Minshall, K.W. Cummins, J.R. Sedell and C.E. Cushing. 1980. The River Continuum Concept; Canadian Journal of Fisheries Aquatic Science, Vol. 37, 1980; pages 130 - 136.

Whitney, G.G. 1990. The History and Status of the Hemlock Forest on the Allegheny Plateau. J. Ecol. 78: 443-458.

Williams, Charles E. 1996. Variation in Herbaceous Layer Species Richness, Biomass and Cover in Allegheny Plateau Riparian Forests. Report No. 96-1, Program in Applied Ecology, Clarion University of Pennsylvania.

Woodrey, M.S. 1986. *In* Brauning, D.W. 1992. Atlas of Breeding Birds in Pennsylvania. Univ. Pittsburgh Press. Pittsburgh, PA. 484 p.

Woomer A. and R. Lee. 1990. Clarion River, West Branch, (217A) Sections 02, 03, and 04 stream examination report. Pennsylvania Fish and Boat Commission. Tionesta, PA. 22 p.

Woomer A. and R. Lee. 1992. Bear Creek (217A) stream examination report. Pennsylvania Fish and Boat Commission. Tionesta, PA. 10 p.

Woomer, A. and R. Lee. 1994. Kinzua Creek, South Branch (216B) Management Report. Pennsylvania Fish and Boat Commission, Bellefonte, PA. 13 p.

Woomer A. and R. Lee. 1994a. Tionesta Creek, East Branch (216F) stream examination report. Pennsylvania Fish and Boat Commission. Tionesta, PA. 15 p.

Woomer A. and R. Lee. 1994b. Sugar Run (216B) stream examination report. Pennsylvania Fish and Boat Commission. Tionesta, PA. 10 p.

Woomer A. and R. Lee. 1994c. Twomile Run (216F) stream examination report. Pennsylvania Fish and Boat Commission. Tionesta, PA. 15 p.

Woomer, A. and R. Lee. 1997. Spring Creek (217A) Management Report. Pennsylvania Fish and Boat Commission, Bellefonte, PA. 6 p.

Woomer A. and R. Lee. 1997a. Crane Run (216F) Management Report. Pennsylvania Fish and Boat Commission, Bellefonte, PA. 5 pp.

Woomer A. and R. Lee. 1998a. Bluejay Creek (216F) stream examination report. Pennsylvania Fish and Boat Commission. Tionesta, PA. 8 p.

Woomer A. and R. Lee. 1998b. Salmon Creek (216F) stream examination report. Pennsylvania Fish and Boat Commission. Tionesta, PA. 10 p.

Woomer, A. and R. Lee. 1999. Tunungwant Creek, West Branch (216C) Management Report. Pennsylvania Fish and Boat Commission, Bellefonte, PA. 4 p.

PERSONAL COMMUNICATIONS

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

Horsley, Stephen. Plant Physiologist. USDA-FS, Northeastern Research Station, Irvine, PA

Hoover, Coeli. Soil Scientist. USDA-FS, Northeastern Research Station, Irvine, PA

Houston, David. Research Scientist, USDA-FS, retired

Liebhold, Andrew. Research Scientist, USDA-FS, Forest Health Monitoring, Morgantown, WV

Nowak, Christopher A. Research Forester. USDA-FS, Northeastern Research Station

Ordiway, Linda. Forest Technician, USDA-FS, Northeastern Research Station, Irvine, PA

Ristau, Todd. Ecologist. USDA-FS, Northeastern Research Station. Irvine, PA

Stout, Susan L. Project Leader. USDA-FS, Northeastern Research Station

Williams, Charles E. Assistant Professor of Biology, Biology Department, Clarion University of Pennsylvania

CHAPTER 6 - GLOSSARY

Accelerate Mature Forest Conditions (AMFC) -- An adaptive management technique designed to hasten the development large-diameter trees. This treatment will reduce stand density and provide growth opportunity to the larger, faster growing trees. As a result, mature-forest characteristics and the coarse, woody debris on the ground will develop more rapidly in these stands than would occur naturally over time.

Active ingredient (a.i.) -- The effective part of a pesticide formulation, or the actual amount of the technical material present in the formulation.

Adaptive Management -- A type of forest land 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.

Age Class – A distinct aggregation of trees originating from a single natural event or regeneration activity, or a group of trees, e.g. 10-year age class, as used in inventory or management.

Allegheny Hardwoods -- Forest type that includes black cherry, yellow poplar, white ash, red maple, black birch, basswood, and cucumber. At least fifty per cent of the basal area must be in cherry, ash, or poplar. In most circumstances, black cherry is the dominant of these three species.

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.

Analysis area – The geographical boundary of the area to be analyzed

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.

Archaeological Resources Protection Act (ARPA) -- Public Law 96-95, 16 USC 470a, passed in 1979, required a permit for any excavation of removal of archaeological resources from public or Indian lands. Excavations must be undertaken for the purpose of furthering archaeological knowledge in the public interest, and resources removed remain the property of the United States.

Arterial roads -- Roads which provide service to large land areas and usually connect with public highways or other forest arterial roads to form an integrated network of primary travel routes. Their location and standard are often determined by a demand for maximum mobility and travel efficiency rather than specific resource management service. They are usually developed and operated for long-term land and resource management purposes and constant service.

Background -- See "Visual distance zone".

Basal area -- Measurement of how much of a site is occupied by trees. It is determined by estimating the diameter at breast height (DBH) of all the trees in the area; that is, to estimate the total cross-section area of all the trees at breast height (4.5 feet above the ground).

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.

Biennial (plant) -- A plant species that completes its life cycle, from seed germination to seed production, in two years. Also means, "to occur every two years," as in biennial burns.

Big game -- The species of large animals, such as deer, bear, and turkey that are hunted.

Bioaccumulation -- The process of a plant or animal selectively taking in or storing a persistent substance. Over time, a higher concentration of the substance is found in the organism than in the organism's environment.

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 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.

Biomass -- The total amount (weight) of living material in a given habitat.

Board foot -- An amount of wood equivalent to a piece measuring 12" by 12" by 1".

Bole -- A tree stem thick enough to yield saw timber, veneer logs or large poles.

Broad-spectrum pesticides -- General-purpose pesticides with a wide range of uses. They are effective when several different pests are a problem to control.

Broadcast application -- Uniform distribution of an herbicide over an entire area.

Browse -- That part of leaf and twig growth of shrubs, woody vines and trees that browsing animals, such as deer, can feed, consume for nurishment.

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.

Canopy closure – see “Crown cover”.

Carrying Capacity -- The maximum number of animals that a habitat can sustain while maintaining the ecosystem in a healthy, vigorous condition.

Chronic (effects or toxicity) -- Having poisonous or deleterious effects from prolonged exposure or repeated administration of a chemical.

Clearcutting – A method of regenerating an even-aged stand in which a new age class develops in a fully exposed microclimate after removal, in a single cutting, of all trees in a previous stand. Regeneration is from natural seeding, direct seeding, planted seedlings, and/or advanced reproduction. Clearcutting may be done in groups or patches (Group or patch clearcutting) or in strips (strip clearcutting). In the clearcutting system, the management unit or stand in which regeneration, growth, and yield are regulated consists of the individual clearcut stand (see group selection). When the primary source of reproduction, the preferred term is "overstory removal".

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.

Collector road -- Serves smaller land areas than a Forest arterial road and is usually connected to a Forest arterial road or public highway. Collects traffic from Forest local roads and/or terminal facilities. The location and standard are influenced by long-term multi-resource service needs as well as travel efficiency. May be operated by either constant or intermediate service, depending on land use and resource management objectives for the area served by the facility.

Conifer -- An order of the *gymnospermae*, comprising a wide range of trees, mostly evergreen, that bear cones and have needle-shaped or scale-like leaves; timber commercially identified as softwood.

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.

Constraint -- Limitation, action that 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.

Crown cover – The ground area covered by the crowns of trees or woody vegetation as delimited by the vertical projection of crown perimeters and commonly expressed as a percent of the total ground area. (Synonym "canopy closure")

Crown Density – The amount and compactness of foliage of the crowns of trees and/or shrubs.

Cutting cycle – The planned interval between partial harvests in an uneven-age stand.

Cultural Resources (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).

Deciduous -- Pertaining to any plant organ or group of organs that is shed naturally; perennial plants that are leafless for some time during the year.

Decommission – Activities that terminate the function of a road.

Decomposition -- Break up into constituent elements through chemical change.

Degrade -- To decompose or break up.

Design Criteria -- The requirements derived from management area direction such as safety requirements and traffic characteristics that govern the selection of elements and standards for a road or section of a road (FSM 7721.05).

Design Elements -- The physical characteristics of a road, such as travel-way width, shoulders, slopes, curve widening, and pavement structures, that, when combined, comprise the planned facility (FSM 7721.05).

Design Standards -- The definitive lengths, widths, and depths of individual elements (such as 14-foot traveled way, 2-foot shoulders, 3/4:1 cut slopes, and 4 inches of crushed limestone) (FSM 7721.05).

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, toilets, drinking water or toilet buildings.

Diameter at breast height (dbh) -- A tree measurement; an estimated 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.

Distance zones - See "Visual distance zone."

Diversity -- The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan.

Dormant -- Not actively growing.

Drift -- That portion of a sprayed chemical that is moved by wind off a target site.

Duff -- The lower portion of the organic layer covering the soil, consisting of decomposed litter.

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.

Ecological land type (ELT) -- An area of land with a distinct combination of natural, physical, chemical and biological properties that cause it to respond in a predictable and relatively uniform manner to the application of given management practices. In a relatively undisturbed state and/or at a given stage (sere) of plant succession, an ELT is usually occupied by a predictable and relatively uniform plant community. Typical size generally ranges from about 10 to a few hundred acres.

Ecological landtype phase (ELTP) – An area of land more narrowly defined than land type, based on topographic criteria (e.g. steepness, position, hydrological characteristics, etc.). This is the smallest ecological unit and is generally less than 50 acres in size.

Ecological niche -- The physical space in a habitat occupied by an organism; its functional role in a community; and its position in environmental gradients of temperature, moisture, pH, soil, and other conditions of existence.

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.

Edge -- The more or less well-defined boundary between two or more elements of the environment; for example, field/woodland.

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")

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 concise public document that 1) briefly provides sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement or to return a finding of no significant impact, 2) aids an agency's compliance with NEPA when no Environmental Impact Statement is necessary, or 3) facilitates preparation of a statement when one is necessary.

Environmental fate -- The transport, accumulation and disappearance of an herbicide in the environment.

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 stream -- A stream that flows less than 10 percent of the time, only in direct response to rainfall, with a channel that may be scoured or unscoured and is always above the water table.

Erosion -- The wearing away of the land 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 stand – A stand of trees containing a single age class in which the range of tree ages is usually less than 10 percent of the rotation.

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.

Existing visual conditions (EVC) - The present state of visual alteration that is measured in six degrees (untouched, unnoticed, minor disturbance, disturbed, major disturbance, drastic disturbance) of deviation from the natural landscape.

Exposure -- The amount of contact with a pesticide.

Fauna - The animals of a given region or period.

Federal Register -- A daily Federal publication that publishes regulations and legal notices that have been issued by Federal agencies.

Filter Strip - a designated area bordering streams and riparian areas where soil compaction by machinery is avoided and soil disturbance is minimized so that the sediment filtering ability of the forest floor is maintained.

Final harvest cut -- Last timber cut of the rotation, when stand is regenerated.

Fiscal Year (FY) -- A 12-month period for which an organization plans the use of its funds. The Forest Service's Fiscal Year runs from October 1 of one year through September 30 of the following year.

Floodplain -- Low land and relatively flat areas joining inland and coastal waters, including debris cones and flood prone areas of offshore 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.

Foreground -- See "Visual distance zone."

Forest Development Road -- A forest road under the jurisdiction of the Forest Service (FSM 7705).

Forest Development Transportation Plan -- The forest development transportation plan is the official description of the forest development transportation system and consists of a base map or series of base maps showing the location of each facility and an inventory record defining their characteristics. These documents shall also serve as the forest development road system plan referenced in the National Forest Management Act (FSM 7711).

Forest Development Transportation System Facilities -- Those facilities, including forest development roads, forest highways, bridges, culverts, trails, parking lots, log transfer facilities, road safety and other appurtenances, and airfields, in the transportation network (FSM 7710.5) and under Forest Service jurisdiction (FSM 7705).

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 Highway (legal definition) -- A Forest road under the jurisdiction of and maintained by a public authority and open to public travel. (Title 23 USC 101, as amended by the Surface Transportation Act of 1978). Note: The USDA Forest Service is not considered a public authority.

Forest Plan – See “Allegheny National Forest Land and Resource Management Plan”

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 group stands of similar character, species composition, and other ecological factors.

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.

Fragmentation – The process, through cutting or natural processes, of reducing the size and connectivity of stands that compose a forest or landscape.

FWS – USDI-Fish and Wildlife Service.

Game species -- Wild animals hunted for food or sport.

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 – A method of regenerating uneven-aged stands in which trees are removed, and new age classes are established, in small groups. The maximum width of groups is approximately twice the height of mature trees, with small openings providing microenvironments suitable for shade-tolerant regeneration and the larger openings providing conditions suitable for regeneration that is more shade-intolerant. In the group selection system, the management unit or stand in which regeneration, growth, and yield are regulated consists of a landscape containing an aggregation of groups (see clearcutting).

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.

Hardwood -- A broad-leaved flowering tree, as distinguished from a conifer. Trees belonging to the botanical groups of *angiospermae*.

Harvest method – A cutting method by which a stand is logged; emphasis is on meeting logging requirements while concurrently attaining silvicultural objectives.

Hazard -- The risk of danger; the chance that danger or harm will come to the applicator, bystanders, consumers, livestock, wildlife or crops, etc.

Hectare (ha) -- 10,000 square meters, or approximately 2.47 acres.

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.

Heritage Resources -- See Cultural Resources.

High quality hardwoods -- Hardwood trees or stands that will yield high-value timber products such as face veneer, knot-free lumber, furniture or specialty product stock and flooring.

High-risk trees -- Trees with a high probability of dying in the immediate future.

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).

Improvement cutting – A cutting made in a stand, pole-sized or larger, primarily to improve composition or quality by removing less-desirable trees of any species.

Ingrowth – Trees that during a specified period have grown past an arbitrary lower limit of (usually) diameter or height. Ingrowth is usually measured as basal area or volume per unit area.

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.

Infiltration -- The downward entry of water into the soil.

Insecticide -- An agent used to control insect populations.

Integrated Pest Management (IPM) -- A comprehensive systems approach to achieving economical pest control in an environmentally safe manner. The individual components of integrated pest management in forestry include cultural, mechanical, manual, prescribed fire, biological, chemical and regulatory means.

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 treatments – A collective term for any treatment designed to enhance growth, quality, vigor, and composition of the stand after establishment or regeneration and prior to final 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.

Interpretive sites -- A developed site at which a broad range of natural or cultural history is interpreted or described for the enjoyment of the public.

Intolerant species -- Those plant species that do not grow well in shade (syn. shade-intolerant species).

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.

KV Funds -- Funds collected for reforestation and timber stand improvement work on areas cut over by a timber sale (authorized by the Knutson-Vandenberg Act, passed by Congress in 1930).

Land condition -- The state of a given area in terms of the quality of its physical and biological character and use. Land conditions can be existing, future or desired.

Land management -- An intentional process of planning, organizing, programming, coordinating, directing and controlling land use action.

Land use -- The occupation or reservation of land or water area for any human activity or any defined purpose.

Landscape – A viewed area of land generally of large size and commonly a mosaic of landforms and plant communities irrespective of ownership or other artificial boundaries.

Litter -- The upper portion of the organic layer covering the soil, consisting of unaltered dead remains of plants and animals whose original form is still visible.

Local road -- Connects terminal facilities with Forest collector and arterial roads or public highways. Their location and standard are usually controlled by a specific resource activity rather than travel efficiency. Forest local roads may be developed and operated for either long- or short-term service.

Long-term sustained yield timber capacity -- The highest uniform wood yield from lands being managed for timber production that may be sustained under specified management intensity consistent with multiple-use objectives.

Maintenance Level -- A formally established criterion which prescribes the intensity of maintenance necessary for the planned use of a road.

> ***Maintenance Level 1*** -- This level is basic custodial care as required to protect the road investment and to see that damage to adjacent lands and resources is held to a minimum. Level 1 maintenance often requires an annual inspection to determine work needed, if any, to keep drainage functional and the road stable. This level is the normal prescription for roads that are not open to traffic. Level 1 is to maintain drainage facilities and runoff patterns.
>
> ***Maintenance Level 2*** -- This level is used on roads where management requires that the road be open for limited passage of traffic. Traffic is normally minor, usually consisting of one or a combination of administrative uses, permittee use, or other specialized traffic.
>
> ***Maintenance Level 3*** -- This level is used on roads that are open to public traffic and generally applies when use does not exceed 15 vehicles average daily traffic (ADT). ADT should be used as a guide in determining the maintenance level but not as the sole criterion. A road may be used by only one or two vehicles a day for most of the year; however, during a brief period, such as hunting season, the road use may increase to 20 or 30 vehicles a day. Total traffic types and planned land use are important criteria for selecting a maintenance

level. The road is maintained for safe and moderately convenient travel, suitable for passenger cars.

Maintenance Level 4 -- This level generally applies when use of a road is between 15 and 100 vehicles ADT (see comment concerning ADT under maintenance level 3). At this level, more consideration is given to the comfort of the user. These roads are frequently surfaced with aggregate material, but some routes may be paved to meet economical considerations of the limited aggregate resource and surface replacement cost factors.

Maintenance Level 5 -- This level is generally for use of 100 or greater vehicles ADT (see comment concerning ADT under maintenance level 3). Roads in this category include both paved and aggregate surfaces. Safety and comfort are important considerations. Abrupt changes in maintenance will be posted to warn a traveler until the deficiencies are corrected.

MBF (thousand board feet) -- One thousand board feet of timber.

MMBF (million board feet) -- One million board feet of timber.

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.

Maximum Modification - See "Visual quality objective."

Middle ground - See "Visual distance zone."

Mineral development -- To open up a mineralized seam, ore body or deposit for production.

Mineral materials -- Common varieties of bedrock, sand, gravel and similar material.

Mitigate -- To make less severe.

Mitigation measure -- An action taken to lessen adverse impacts or enhance beneficial effects.

Modification - See "Visual quality objective."

Monoculture – A stand of a single species, generally even-aged.

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.

NEPA process -- All measures necessary for compliance with the requirements of Section 2 and Title I of NEPA (40CFR1508.21).

National Environmental Policy Act (NEPA) -- Establishes a national policy to encourage productive and enjoyable harmony between humankind and the environment, to promote efforts that will prevent or eliminate damage to the environment and stimulate the health and welfare of humans, to enrich the understanding of the ecological systems and natural resources important to the nation, and to establish a Council on Environmental Quality.

Native Species -- Any specie of flora or fauna that naturally occurs in the United States and that was not introduces by humans.

Natural -- Existing and/or formed by nature. Not artificial.

Natural Appearing Landscape Character – Landscape character that has resulted from human activities, yet appear natural, such as historic conversion of native forests into farmlands, pastures, and hedgerows that have reverted back to forests through reforestation activities or natural regeneration.

Natural regeneration – An age class created from natural seeding, sprouting, suckering, or layering.

New Road Construction -- Investment in construction of a road to provide access that adds new miles of road to the transportation system (FSM 7705).

No new federal action alternative -- The most likely condition expected to exist in the future if current management direction would continue unchanged.

Northern hardwoods -- Forest type where sugar maple, beech, yellow birch, and hemlock comprise fifty percent or more of the basal area. For example, 35% sugar maple, 20% red maple, 20% black cherry, 15% beech, and 10% hemlock.

OGM -- Acronym for "oil, gas, and minerals."

Obliteration -- The returning of the land occupied by a road or trail to production, i.e., a kind of decommissioning.

Objective -- A clear and specific statement of planned results to be achieved within a stated time. 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.

Old growth – Forest ecosystems distinguished by old trees and related structural features characteristic of later stages of stand and successional development. Some have large trees, snags, large down woody material, multiple tree canopy layers, associated herb and shrub

components and canopy gaps. Some of these attributes may also be found in stands in earlier stages of development or in managed stands.

Organic material -- An accumulation of decayed and re-synthesized plant and animal residues with a high capacity for holding water and nutrients.

Oust® -- Commercial formulation of the herbicide sulfometuron methyl manufactured and marketed by DuPont.

Overstory -- Relative to even-aged stands; the mature trees which overtop the younger trees.

Overstory removal – The cutting of trees comprising an upper canopy layer in order to release trees or other vegetation in an understory (see "clearcutting").

Partial retention - See "Visual quality objective."

Percent stocking -- The number of trees in a stand as compared to the desirable number for best growth and management, expressed as a percent.

Percolation -- The flow of a liquid through a porous substance.

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 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.

Plateau -- A level or horizontal region at a considerable height above sea level or the surrounding regions.

Pole -- A tree between the size of a sapling and a mature tree.

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.

Public road -- Any road under the jurisdiction of and maintained by a public authority that is "open to public travel" (Title 23 USC, section 101(a)).

Pulpwood -- The wood from trees used to make paper.

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.

Record of Decision (ROD) -- The documentation of what decision was made, 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, which aggregates 12 hours. It may consist of one person for 12 hours, two people for 6 hours, or any combination.

Reforestation – The natural or artificial restocking of an area with trees

Regeneration – Seedlings or saplings existing in a stand; or the act of establishing young trees naturally or artificially.

Regeneration cut – A cutting method by which a new age class is created. The major methods are clearcutting, seed tree, shelterwood, selection, and coppice.

Relative stand density -- Measurement of stand density in mixed species stands, which allows for variable tree sizes and species composition.

Release – A treatment designed to free young trees from undesirable, usually overtopping, competing vegetation.

Removal cut (shelterwood cut) -- The last timber cut in a shelterwood regeneration, which removes the trees that have provided seed and shade for the new stand

Reserve trees – Trees, pole-sized or larger, retained in either a dispersed or aggregated manner after the regeneration period under the shelterwood or selection methods.

Restore understory within mature forest conditions (RUMFC) – An adaptive management technique designed to transition stands with dense fern and grass understories to a more natural, multi-layered, vertical structure than exists currently. The effect of harvesting one third of the trees is to create light conditions that promote seedling growth.

Reserved and outstanding mineral rights -- Privately owned rights to develop and extract subsurface minerals from National Forest lands.

Resource -- Anything which is useful for something, be it animal, vegetable or mineral, a location, a labor force, etc. Resources, in the context of land use planning, thus vary from such commodities as timber and minerals to such amenities are scenery or scenic viewing points.

Retention - See "Visual quality objective."

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, which is identified by soil characteristics and distinctive vegetation communities that require free or unbound water.

Road maintenance -- Expenditures in the minor restoration and upkeep of a road necessary to retain the road's approved traffic service level (FSM 7705).

Road Reconstruction -- The investment in construction activity that results in betterment, restoration, or in the realignment of a road as defined below:

Realignment -- Investment in construction activity that results in the new location of an existing road or portions thereof (FSM 7705).

Betterment -- Investment in construction activity that raises the traffic service level of a road or improves its safety or operating efficiency (FSM 7705).

Restoration -- Investment in construction activity required to rebuild a road to its approved traffic service level (FSM 7705).

Road Management (Traffic Management) -- Procedures to manage and control use of Forest development roads to prevent damage to the roadway; to abate unsafe traffic conditions; to limit the use of vehicles that exceed design capacity such as width, weight, or length of loads; to require appropriate investment sharing from commercial users; and to reduce maintenance costs. Also, manage and control use to meet other specific management direction such as protecting wildlife habitat or achieving semi-primitive recreation objectives. There are three basic road management strategies on the ANF (FSM 7731.1):

Open -- Forest roads are open year round to public traffic.

Closed -- Forest roads are closed year round to public traffic.

Restricted -- Forest roads are open part of the year, and closed part of the year to public traffic.

Rock (mineral materials) pits - Areas utilized as sources of material for surfacing low standard roads. Also called: stone pits, pits, or gravel pits.

Rotation -- The number of years required to establish and grow a timber crop to a specified condition of maturity. The rotation includes a period for harvesting and stand re-establishment (usually five years).

Runoff -- That part of precipitation, as well as any other flow contributions, that appears in surface streams, either perennially or intermittently.

Sapling -- As used in timber survey, trees 1.0 to 4.9 inches at DBH.

Saw timber -- As used in timber survey, trees larger than 11 inches at DBH.

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.

Seed cut -- See "shelterwood cut." Preparatory phase of shelterwood harvest system.

Seedlings -- As used in timber survey, trees less than one inch at DBH.

Selection harvest cut – See “uneven-aged management”.

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 species' existing distribution.

Sensitivity level - As used in visual quality management, a particular degree or measure of viewer interest in the scenic qualities of the landscape (1 - Most sensitive; 2 - Sensitive; 3 - Least sensitive)

Shade- tolerant species -- A tree or other plant species having the capacity to grow without receiving direct sunlight.

Shelterwood system – A method of regenerating an even-aged stand in which a new age class develops beneath the moderated microenvironment provided by the residual trees. The sequence of treatments can include three distinct types of cutting: 1) an optional preparatory cut to enhance conditions for seed production; 2) an establishment cut to prepare the seed bed and to create a new age class; and 3) a removal cut to release established regeneration from competition with the overstory. Cutting may be done uniformly throughout the stand, in groups or patches, or in strips.

Shelterwood seed cut -- Intermediate cut of shelterwood regeneration when all trees are removed except those needed to provide seed and shade for the new stand.

Shrub -- A plant with persistent woody stems and relatively low growth form; usually produces 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, and scarifying. All treatments are designed to modify the soil, litter, and vegetation and to create microclimate conditions conducive to the establishment and growth of desire species.

Size class – Tree size recognized by distinct ranges, usually of height or diameter.

Skid trail – Travel way used to drag or transport trees from the stump to the 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 Group I – Well-drained soils.

Soil Group II – Moderately-drained soils.

Soil Group III – Poorly-drained soils.

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 – 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.

Stand density – A quantitative, absolute measure of tree occupancy per unit of land area in much the same terms as number of trees, basal area, or volume.

Stocking – An indication of growing-space occupancy relative to a pre-established standard. Common indices of stocking are based on percent occupancy, basal area, relative density, and crown competition factor.

Standard -- A principle requiring a specific level of attainment; a rule to measure against.

Stream -- A channel with defined bed and a bank that carries enough water flow at some time during the year to flush out leaves.

Structure – the horizontal and vertical distribution of components of a forest stand including the height, diameter, crown layers and stems of trees, shrubs, herbaceous understory, snags, and down woody debris.

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 foregone. A unit of land may be suitable for a variety of individual or combined management practices.

Suitable timberlands -- 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.

Sustainability – The capacity of forests, ranging from stands to ecoregions, to maintain their health, productivity, diversity, and overall integrity, in the long run in the context of human activity and use.

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.

Systemic effects -- Effects resulting from movement of a foreign substance within an organism.

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).

Thinning – A cultural treatment made to reduce stand density of trees primarily to improve growth, enhance forest health, or to recover potential mortality.

Threatened Animal Specie -- Any animal specie likely to become endangered within the foreseeable future through all or a significant portion of its range.

Threatened Plant Specie -- Any plant specie likely to become endangered within the foreseeable future through all or a significant portion of its range, including species categorized as rare, very rare or depleted.

Threatened Specie -- Any specie which is likely to become endangered within the foreseeable future and which has been designated in the Federal Register as threatened specie.

Tiering – Tiering refers to the coverage of general matters in a broader environmental impact statements (such as national program or policy statements) with subsequent narrower statements or environmental analyses (such as regional or basin-wide program statements or ultimately site-specific statements) incorporating by reference the general discussions and concentrating solely on the issues specific to the subsequent statements or analyses is:

a. From a program, plan or policy environmental impact statement to a program, plan, or policy statement or analysis of lesser scope or to a site-specific statement or analysis.

b. From an environmental impact statement on a specific action at an early stage (such as need and site selection) to a supplement (which is preferred) or a subsequent statement or analysis at a later stage (such as environmental mitigation). Tiering in such cases is appropriate when it helps the lead agency to focus on the issues which are ripe for decision and exclude from consideration issues already decided on or not yet ripe (40CFR1508.28).

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. For 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.

Traffic Service Level (TSL) -- Traffic service levels describe the significant traffic characteristics and operating conditions for a road. These levels are identified as a result of transportation planning activities. Objectives are established for each road and may be expressed in terms of the area and resources to be served, environmental concerns to be addressed, amount and types of traffic to be expected, life of the facility, and functional classification.

Transportation Network -- All existing and proposed roads, trails, airfields, and other transportation facilities wholly or partly within, or adjacent to, and serving the National Forests and other areas administered by the Forest Service or intermingled private lands (FSM 7710.5).

Two-aged system – Silvicultural methods designed to maintain and regenerate a stand with two age classes. The resulting stand may be two-aged or tend towards an uneven-aged condition as a consequence of both an extended period of regeneration establishment and the retention of reserve trees that may represent one or more age classes.

Two-aged shelterwood seed cut – A intermediate cut designed to establish regeneration on the forest floor in the two-aged process. The residual stand consists of residual seed trees in addition to the smaller sawtimber sized trees that will be carried into the next rotation. Once seedlings become established the seed trees are removed releasing the seedlings to grow underneath the residual stand left.

Two-aged removal cut – The final cut in the two-aged process releasing existing seedlings to grow under the residual overstory.

Two-aged stand – A stand composed of two distinct age classes that are separated in age by more than 20 percent of rotation.

USDA -- U.S. Department of Agriculture.

USDA-FS -- U.S. Department of Agriculture, Forest Service.

USDI – U.S. Department of the Interior.

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 methods – 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 – Forest type where red maple, black cherry, black birch, yellow polar, white ash, basswood, and cucumber comprise 50% or more of the basal area. For example, 40% red maple, 20% black cherry, 20% sugar maple, 15% hemlock, and 5% beech.

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.

Vegetative manipulation -- The change from one vegetation type to another. It can be done using a tractor, chemicals or fire. Usually done to increase forage for livestock; it can be a beneficial tool for wildlife management.

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 absorption capacity (VAC) - Indicates the relative difficulty or cost of achieving VQOs; measures the land's capacity to absorb the visual impact of management activities.

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.

Middle ground - That part of a scene or landscape that extends from the foreground zone to one-half to two 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.

Visual quality objective (VQO) -- A desired level of excellence based on physical and sociological characteristics of an area. Refers to the quality of a landscape, the degree of acceptable alteration on the characteristic landscape.

Maximum Modification (MM) - Human activity may dominate the characteristic landscape but should appear as a natural occurrence when viewed as background area.

Modification (M) - Human activity may dominate the characteristic landscape but must, at the same time, utilize naturally established form, line, color and texture. It should appear as a natural occurrence when viewed in foreground or middle ground.

Partial Retention (PR) - Human activity may be evident but must remain subordinate to the characteristic landscape.

Retention (R) - Human activities are not evident to the casual forest visitor.

Preservation (P) - Provides for ecological change only.

Water table -- The upper limit of the part of the soil or underlying rock material that is wholly saturated with water.

Watershed – An area of land with a single drainage network.

Weed -- A plant growing where it is not desired.

Wetlands -- Those areas that are inundated by surface or ground water often enough to support plants and other aquatic life that requires saturated or seasonally saturated soils for growth and reproduction. Wetlands generally include swamps, marshes, bogs and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats and natural 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.

CHAPTER 7 - LIST OF PREPARERS AND TECHNICAL CONSULTANTS

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.

PREPARERS

ADAMS-WEYANT, Brenda **Outdoor Recreation Planner** **ID Team Member**

Education: B.S. Natural Resources with an emphasis in parks and recreation management and law enforcement; National Ranger Training Institute.

Experience: 10 years USDA Forest Service, recreation planning and operations

DeMARCO, Lois **Silviculturist/Analyst** **ID Team Member**

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 17 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).

HOPPE, Donald **Budget Officer** **ID Team Member**

Education: B.S. Forestry. M.S. Forestry with a focus on resource economics, systematic analysis and resource planning

Experience: 25 years, USDA Forest Service. Assistant Ranger, Wild and Scenic Rivers, NEPA Coordination, Forest Planning, and Forest Budget

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

KANDARE, Richard P. **Forest Archaeologist** **ID Team Member**

Education: A.A.S. Liberal Arts and Social Sciences; B.A. Anthropology; M.A. Anthropology with a specialization in archaeology.

Experience: 11 years, USDA-Forest Service, Heritage resource management; 10 years, archaeologist for consulting firms, state archaeological organizations, and other federal agencies.

Papers: Assessing Native American Disturbances in Mixed Oak Forests of the Allegheny Plateau. In 1996 Proceedings of the National Silvicultural Workshop. GTR.NE-238. Co-author.

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

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.).

LELAND, Carl **Forester** **ID Team Leader**

Education: B.S. Forest Management

Experience: 24 years USDA Forest Service

MORIARITY, William J. **Terrestrial Scientist** **ID Team Member**

Education: B.S. Agriculture – Agronomy (Soil Science)

Experience: 5 years, USDA-Soil Conservation Service; 37 years, USDA-Forest Service (soil management, human resources, District Ranger (8 years), riparian area management, and ecological classification, monitoring, and inventory). Soil survey inventory leader in Indiana and Missouri.

Papers: Riparian Research and Management on the Allegheny National Forest. Charles E. Williams and William J. Moriarity. Pennsylvania Forests; Summer 1997. Draft Discussion Guide: Riparian Ecosystem Management; June 4, 1996. Ecological Landtype Mapping Poster Sessions @ Southern Appalachian Assessment Conference, West Virginia and @ National Ecological Society Meeting Providence, Rhode Island; Charles E. Williams, George Baumer, and William J. Moriarity.

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.

PENCE, Brent **Fisheries Biologist** **ID Team Member**

Education: B.S., Fishery Resource Management; Fish Habitat Management; Riparian Management Workshop; Fish Program Management; Applied River Geomorphology

Experience: 15 years, USDA-Forest Service: fish habitat; USDI-Fish and Wildlife Service; fish culture and sea lamprey control; water quality monitoring.

SALM, F. Daniel **Civil Engineer** **ID Team Member**

Education: A.A.S Electronics Engineering Technology; B.S. Forest Engineering; M.S. Civil Engineering with minor in Forest Engineering geared toward low volume roads and logging engineering.

Experience: 20 years, USDA Forest Service: Transportation planning, logging engineering, microcomputers.

SCHOEPPEL, Mary **Forester** **ID Team Member**

Education: B.S. Forest Management

Experience: 10 years, USDA Forest Service

STUBBE, Janet **Landscape Architect** **ID Team Member**

Education: B.S. Landscape Architecture (Natural Resource Analysis)

Experience: 10 years, Landscape architect for consulting engineers; 8 years, USDA Forest Service landscape architect.

THURSTON, Pamela K. **Wildlife Biologist** **ID Team Member**

Education: B.S. Wildlife Management

Experience: 10 years, USDA Forest Service

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.

WINGATE, Stephen B. **Forester** **ID Team Member**

Education: B.A. Forestry. M.A. Forest Management. Continuing Education. Certified Silviculturist.

Experience: 25 years of Lakes States and Northeast Area Forest Management and silviculture; 1 year Asian Forest Management.

Papers: "Seeing is Believing" paper on repeat photography, National Silviculture Conference. 1998. Communicating Old-Growth management on the Allegheny National Forest.

TECHNICAL CONSULTANTS

- HICKEY, Jeanne — Natural Resource Specialist-NEPA
- HOSMER, Mary — Fisheries biologist
- IRVINE, Arnie — Forester
- KLINE, Richard — Forestry Technician
- KOBIELSKI, Stanley — Forester, District Silviculturist
- MAROCCO, Bernie — Civil Engineering Technician
- MCBRIDE, Robert — Forester
- McDONALD, Donna — Planning Assistant
- PENCE, Vicki — Forester
- REITZ, Scott — Wildlife Biologist
- WALLACE, Wendell — Forester, GIS Coordinator
- WEYANT, John — Natural Resource Specialist-NEPA
- WINGATE, Susan K. — Forester

APPENDIX A

PUBLIC INVOLVEMENT

This appendix briefly summarizes the public involvement efforts that have been conducted during the preparation of this Environmental Impact Statement.

INITIAL PROJECT SCOPING

"Scoping" is the term given to the process of gathering pertinent information about a project during an analysis under the National Environmental Policy Act (NEPA). During scoping, the project description is provided to the general public, internally within the Forest Service, and to other agencies. The primary purpose of scoping is to determine the scope of issues to be addressed in the analysis and to identify the significant issues related to a proposed action (40 CFR 1501.7).

The Interdisciplinary Team for the East Side Project conducted an analysis in this project area in order to implement the Forest Plan. During this analysis process, resource specialists from several disciplines inventoried and analyzed information concerning the proposed project area. A proposed action was identified as a result of this analysis process that would help move from the Existing Condition toward the Desired Future condition. Issues that arose during the process became part of the Purpose and Need and were incorporated into the Proposed Action.

The Forest Service Administrative Appeals process requires each National Forest to issue a Quarterly Schedule of Proposed Action that contains a list of NEPA projects that will be initiated in that quarter. The East Side Project was identified first in the January 1998 issue as a upcoming project, and its status has been listed in all subsequent issues. The quarterly, "Eyes on the Allegheny," was sent to approximately 400 individuals and/or organizations.

On April 17, 1998, a news release was issued describing the proposed project, providing background information, and inviting public comment. This news release was sent to over 200 media outlets.

On April 21, 1998, a letter identifying the purpose and need for the East Side project, the proposed action, and background information was sent to individuals and organizations who had asked to be informed of all proposed Forest Service management activities and others who had commented or asked to be involved in the previous projects that are now incorporated into this analysis.

A Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for the East Side Project was published in the Federal Register on April 23, 1998.

The news release, scoping letter and NOI invited comments from the public to help identify issues they might have concerning the Proposed Action.

As a result of these efforts, 242 responses representing a wide range of interests and comments were received on the East Side Project. Responses were received as letters, petitions, and form letters. All correspondence is contained in the Project File.

ORGANIZATION OF COMMENTS

The initial step in analyzing the comments received was to organize and code the comments. After a review of the comments, a coding system was developed for this project that utilized nine, broad-based categories that were further subdivided into specific resource categories or concerns (see Table A-1). Each specific area was assigned a code within its category range (i.e., a comment addressing biodiversity was coded 101). All comments were coded using this system and entered into a database. This process allowed the ID Team to sort and analyze similar comments.

TABLE A-1. EASTSIDE EIS COMMENT CODES

Subject	Category	Subject Code	Category Code
Ecological Patterns	General	ECO	100
And Processes	Biodiversity		101
	Ecological Land Classification		102
	Ecosystem Health		103
	Landscape Corridor		104
	Succession		105
	Natural Disturbance		106
	Old Growth		107
	Riparian		108
	Watershed		109
	Insect and Disease		110
	Wilderness		111
	Fragmentation/Edge Effect		112
	Landscape analysis		113
	Comment Noted		199
Physical Environment	General	PHY	200
	Minerals		210
	OGM/OGM Laws		211
	Rock Pits		220
	Soils		230
	Water Quality		240
	Atmospheric (Air, Acid Rain, etc.)		250
	Visual Mgmt/Scenery		260
	Comment Noted		299
Planning Criteria	General	PLG	300
	Forest Plan/THCR		301
	Management Areas		302
	Laws/Court Rulings		303
	KV/SSF		304
	Definitions		305
	Purpose and Need		306
	Data/Inventory		307
	Alternatives		308
	Cumulative Effects		309
	Monitoring		310
	Research		311
	Mitigation/Standards & Guidelines		312
	NEPA Process		313
	Comment Noted		399

Subject	Category	Subject Code	Category Code
Transportation	General	TRA	400
	Impacts		401
	Density		402
	Access Management/Gates		403
	Comment Noted		499
Recreation	General	REC	500
	Developed		501
	Dispersed		502
	Wild and Scenic Rivers		503
	Trails Motorized		504
	Trails Non-Motorized		505
	Comment Noted		599
Social/Economic	General	SOE	600
	Employment		601
	25% Fund/PILT		602
	Community Stability		603
	Below Cost Sales		604
	Heritage		605
	Economic Analysis		606
	Comment Noted		699
Vegetation Management	General	VEG	700
	Silvicultural Methods/Opening Sizes		701
	Harvest Methods		702
	Even-aged/Uneven-aged mgmt.		703
	Salvage		704
	Harvest Level/ASQ		705
	Reforestation/Regeneration		706
	Fencing		707
	Herbicide		708
	Inventory and Analysis		709
	Land Suitability		710
	Growth/Yield		711
	No logging		712
	Understory		713
	Impacts of Logging		714
	Nutrition/Nutrient Cycling/Fertilization		715
	Burning		716
	Comment Noted		799

Subject	Category	Subject Code	Category Code
Wildlife	General	WLF	800
	Management Indicator Species		801
	Threatened, Endangered, Sensitive Species		802
	Deer		803
	Neotropical Migrants		804
	Interior species		805
	Aquatic Species (Fisheries)		806
	Habitat		807
	Comment Noted		899
Other	General	OTH	900
	Request (send something)		910
	Comment Noted		999

FORMULATION OF ISSUES

After coding and sorting the comments, they were reviewed and a preliminary list of issues was developed. The following is the list of preliminary issues:

- Roads and pits
- Herbicides
- Fragmentation/Biodiversity
- Economics
- Old Growth
- Road restoration without logging
- Exceeding 40-acre openings
- Water quality and fisheries
- Sustainability
- Riparian Management
- Soils
- Indiana Bat (T&E species)

The ID Team then reviewed the preliminary list of issues against the following criteria:

- Were they issues that should be addressed at a higher level?
- Have they already been addressed at a higher level?
- Can they be resolved by applying Forest Plan Standards and Guidelines?
- Could they be resolved by modifying the Proposed Action?

Issues that remain after applying the above criteria were considered "unresolved" and were considered in the formulation of Alternatives to the Proposed Action. The following issues were identified through the scoping process.

- Should no timber harvesting, or very minor amounts, be proposed but other management activities be initiated?
- How much harvesting of dead and declining trees should be proposed in the planning area?

- Should only dead and dying trees be considered for this project proposal?
- Should herbicides be used in this proposal?
- Should any new roads be built?
- What level of reconstruction should be proposed for the existing road system?
- As a result of the litigation discussed in the Background section of Chapter I in the EIS, the Order signed by United States District Judge William L. Standish on October 15, 1997 contains the following direction: "On remand, defendants shall reconsider their determination that the even-aged management techniques proposed in the Mortality II Project for Management Area 3 meet the "optimality" and "appropriateness" requirements set forth in 16 U.S.C." Therefore, the following issues are considered:

  Will uneven-aged management techniques work in MA 3.0 stands currently using even-aged techniques?

  Are there other stands within the project area in MA 3.0 on which it would be appropriate to use uneven-aged management? or

  Should uneven-aged management techniques be prescribed in stands where it is not biologically feasible?

RESPONSE TO COMMENTS

All comments were reviewed to determine how the information would be used in the analysis. Although a disposition of each comment from scoping is not required by NEPA nor the Council on Environmental Quality (CEQ), the ID Team felt it was important to direct the commentor as to where in the document or project file the commentor should look to find an answer to the individual question or comment. Therefore, a response coding system (see Table A-2) was developed based upon the various parts of the EIS. Each comment in the database was coded as to where in the document the comment information was discussed.

TABLE A-2. RESPONSE TO COMMENTS CODES

Code	Refers To:
99	Comment Noted
SC	Beyond the Scope
PN	See Chapters 1 and 2, Purpose and Need, and Alternatives
EF	See Chapter 3, Existing Condition, and Effects of Alternatives
VR	See Vegetation Report
MM	See Mitigation Measures,
AL	See Alternatives
GL	See Glossary for explanation of a term
BA	See Biological Assessment/Wildlife Report
PF	See Project File or refer to an existing document such as the Herbicide EIS or Fisheries Amendment
X	Brief Clarification
TR	Pertains to Thomas Rock EA only*

These comments were the same comments that were received for the 30-day comment period for the Thomas Rock EA. Work on the Thomas Rock EA was discontinued and the project was incorporated into the East Side proposal. These comments did not generate any new issues and were therefore coded this way.

Many comments received were expressions of opinion or general statements. While these provided the team with general feelings of the public on the project, such comments did not provide any information for site-specific analysis nor address any item that needed to be covered in the document. These comments were coded 99. Likewise, some comments were outside the scope of analysis for this project.

Comments such as "I want to see more wilderness" would be coded SC because wilderness designation needs Congressional actions, clearly outside the scope of this ID Team looking at a site-specific project.

In some instances, people also recommended alternatives (coded AL). The ID Team reviewed all "AL" comments to determine if the proposed alternative fit the Purpose and Need of the project and could be worked in as feasible alternatives. Those suggestions that were not incorporated into one of the action alternatives were discussed in the Alternatives Considered but Eliminated From Detailed Study section. Some comments requested that a Mitigation Measure (i.e., a request to have specific harvest guidelines for wet soils) be considered by the ID Team. These types of comments were coded MM.

Comments coded VR, EF, PN, GL, BE, or PF mean that the reader should look in the appropriate section of the document to find a response to the comment or question. The ID Team working on the East Side project reviewed the comment codes by their subject category and subsequently addressed each remaining comment that needed further attention. A comment with an “X” code meant that a very brief clarification was needed.

The purpose of this analysis was to provide enough information to the Deciding Officer so that a sound decision, based upon the best available information, could be made. NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail (40 CFR 1500.1(b)). Due to the large number of comments received, the individual comments with the coding system are not included in this appendix; they are, however, a part of the Project File. The public is welcome to review the database or printouts upon request.

PUBLIC INVOLVEMENT FOR THE DRAFT EIS

DRAFT EIS MAILING LIST

Copies of the Draft Environmental Impact Statement and/or a Summary of the DEIS were mailed to the following individuals and organizations (documents sent to those names followed by an (*) were returned by the U.S. Postal Service as undeliverable):

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, Region 9
USDA-FS, WO, Environmental Coordination Staff
USDA National Agricultural Library
USDA Natural Resources Conservation Service
USDA Office of Civil Rights
USDA OPA Publications Stockroom
USDI Fish and Wildlife Service, State College Field Office
USDI National Park Service, William R. Menke
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, Bob Steiner
Pennsylvania Game Commission, Robert W. Schlemmer
Pennsylvania Historic and Museum Commission, Paul Funk

Local/Regional:

Clinton County Commissioners, Dean Bottorf
Elk County Commissioners
Erie County Dept. of Health, Robert Wellington
Forest County Commissioners
Forest County Conservation District, Douglas E. Carlson
McKean County Commissioners
McKean County Planning Commission, Deborah Lunden
North Central PA Regional Planning and Development, Don Masisak
Ridgway Township, Milly Bowers
Warren County Commissioners
Wetmore Township Supervisors, Elaine P. Bodistow

Area Libraries:

Bradford Area Public Library
Clarion Free Library
Clarion University Library
Cornell University Mann Library
Erie County Library
Friends Memorial Library
Johnsonburg Public Library
Marienville Area Library
Ridgway Public Library
Sheffield Township Library
St. Marys Public Library
Sugar Grove Free Library
Tidioute Public Library
Tionesta Public Library
University of Pittsburgh at Bradford Library
University of Pittsburgh Library
Warren Public Library
West Chester University Library
Youngsville Public Library

Businesses/Individuals/Organizations:

Aguzz, Jim
Albert, Martin P. M.D.
Alexander, Peter and Sara
Alice Water Protection Assn., Patricia A. Paul
Allegheny and Eastern Railroad, Inc., William V. Gentilman
Allegheny Alive, Dave Martin
Allegheny Defense Project, John A. Keslick, Jr.
Allegheny Defense Project, Mike Kaizar

Allegheny Defense Project, Jim Kleissler
Allegheny Forest Alliance, Steven Troha, Executive Director
Allegheny Hardwood Utilization Group, Sue Swanson, Executive Director
Allegheny Medium Density Fiberboard, The AMLP Team
Allegheny Particleboard, Ltd., Chris Works
Frank Ambrose
Amersbach, Gabriel (*)
Andersen, Lawrence D.
Arnold, Mr. and Mrs. Robert C.
Aul, Brian
Balk, Charles M. (*)
Balliet, Doug
Bateman, Joseph
Baumgartel, Kurt
Beahan, Laurence T., M.D.
Belitskus, Margaret R.
Benson, Barbara N.
Bergenfield, A.
Blain, Laura
Blechschmidt, Nancy
Blum, Sarah
Blumenthal, Carol Pinsky
Bodow, Stacy
Bomboy, Herb
Bradford Era, Jim Buck
Bradford Forest Products, Mark Connolly
Brady, Jason
Braid, Joshua
Brainerd, William E.
Branstrom, Kelly
Brett, Terry
Brodie, Janis
Brookens, Robert
Broskey, Michelle
Brotman, Patricia
Brown, Dorothy R.
Brown, Albert
Brunner, Roy
Buggey, Alina
Burick, Donald
Burkert, Lauren
Bush, Jean M.
Callen, Doug
Camp 7 Crown, Inc., Richard McClinton
Camp Broken Axel, Ray Egger
Cardiff, Scott
Carlson, Martin
Carnes, James S.
Carter, Clark
Casey, Breen
Cerminara, Jodi (*)
Chauduary, Zalid
Cherico, Cara
Chernoff, Al
Chiavetto, Diana
Chicchia, Antoinette P.
Christopher, Trisha A.
Citizens Campaign for the Environment, Lori M. Catanzaro
Clan, Therese
Clark Univ. Grad. Sch. of Geography, Deborah Che
Clean Air Council, John Sinker
Cochran and Zandi Lumber Co., Chris Cochran and Dan Zandi
Compeau, Kelly
Concerned Citizens of Ridgway, Elizabeth J. Hoehn, M.B.A.
Cornell Greens, Kristin Reuther
Cottrell, Phil
Counts, Russell E.
Crowe, Todd J.
Crowell, John L.
Crown Hardwood Co., Inc., Peter Schlobach
Cubbon, Nancy
Culver, Dennis
Curry, Susan
D'Orazio, Diana
Daly, Tina
Davis, Marie
Deane, Ann P.
Delaware Audubon Society, Leslie G. Savage
Delost, Ann
Denmare, Joe
Denmarsh, T. Alexander
Diamond, Laura
Diehm, Chris
Dietrich, Dena
Dononfrio, Vince
Dorazio, Diana
Douthett, Claire and Marcella
Dufour, Joel
Dukelow, Donald
Earth First! New York Chapter, James Hansen
Earth First! NYC, Wetlands Preserve
East Coast Four-wheel Drive Assn., Gary Marr
Eckel, Frank J.
Eco-Action, Peter Lawler (*)
Edinboro Creations, Ward S. Troetschel
Engel, Gabriel M.

Enrich, Jonathon
Erie Times News, John Bartlett
Evans, William
Farley, Gerald
Fay, Meghan
Felger, Josephine
Felger, Mark
Fine, Gary
Flanders, John
Flint, Anna
Forest Guardians, Bryan Bird and John Talberth
Foster, Carrie
Frazzini II, Daniel (*)
Fuller, Sarah (*)
Garris, Clyde and Janice
Gauger, Nicholas
Gedgaudas, Amy
Gelson, Tom (*)
Genth, April L. (*)
Gianni, Andrew
Giazzoni, Gina
Gladicki, Brooke (*)
Glasson, June
Godfrey, Mr. and Mrs. Kenneth
Godlove, Sarah
Graves, Ed
Gray, Gary
Green, Sarah
Greene, Valerie
Grove Jr., Ralph
Gustin, Scott A.
Gwinn, James T., P.E.
Harman, Jon
Harris, Ted
Harris, Nate
Hayes, Sam
Head, David L.
Head, Victor and Florence
Heartwood, J. Bensman
Heartwood, Rodger Clarke
Heartwood, Missouri Office, Devin M. Scherubel
Heintz, Steve J.
Heller, Maxine
Henderson, Jeanne, M.
Henderson, John
Hill, Roger
Hill, Rosalie
Hitchcock, Deanna P.
Hollabaugh, Curtis J.
Holt, Thomas W.
Hudson, Mark
Hughes, Liz
Hughes, Shannon
Hutchins, Larry
Hutchinson, John
Imbrogno, Jeanette
Jackson, Mr. and Mrs. Andrew
Javadi, Aresh
Jazwiecki, Jim
Johns-Richardson, Helen J.
Johnson, Newkirk
Jones, Juliette (*)
Kain, Tom (*)
Kane Area School District, Rick Fritz
Kane Hardwoods, Blaine Puller
Karp, Molly
Kase, Tom
Keineby, Scot (*)
Keith Horn, Inc., Kenneth Kane
Keith Horn, Inc., Keith Horn
Keller, Benjamin
Kelly, Brian
Kentucky Heartwood, Chris Schimmoeller
Kerby, Fabienne
Keslick, Wendy (*)
King, David
Kinney, Tiffany
Kleissler, Katelin
Klements, Albert and Marie
Klingler, Keith
Kocjancic, Edward F.
Koons, Glenn B. (*)
Kosaber, Mike
Kosar, John
Kozlow, Karen
Kramer, Bradley
Krichbaum, Steven
Kruse, Michael
Kulka, Michael
Kulibert, Muriel J.
Kurtz, Heather R. (*)
Lady Luck Lodge, Robert D. Sommerville
Lakomy, Steve, M.D.
Landenslager, Richard
Lasalle University, Professor George Dozpa
Law, Paul D.
Lawrence, Edward
Lefort, Eileen and Paul
Leslie, Robert
Lester, Daniella
Lewis, Marvin
Lewyn, Michael
Lind, Frankie
Linkes, John

Lisle, Sarah K.
Lisle, Morgan R.
Long, Eli
Lord, Elizabeth
Lovejoy, Allison
Lurito, Anthony
Lynch, Nancy
Lyons, Tim
Maccari, Nicholas (*)
MacCartney, Barbara
MacCartney, Chris
MacDonald, Meagan
MacIntyre, Shawn
Mahkorn, Jamie
Mahoney, Dadere (*)
Mail, Randi
Manahan III, Frank
Margayesi, Greg (*)
Mark, David J.
Markboew, Diane
Marm, Courtney
Marsh, Karlin
Martin, Diane
Martin, Jeff
Martin, John and Doris
Martin, Joseph
Martin, Rachel
Mass/Penn Lodge, Margaret Holland
Matson Wood Products, Len Dominic
McClintock, Brett
McCullough, Judith
McGee, Bonnie
McGowan, Danny
McGreevy, Jonah
McGuire, Karen, M.
McKown, John
McLaughlin, Matt
McMahon, Frank
McNavage, John C.
McNavage, Mary Louise
McNavage, John P., PhD.
Meade, Sharon
Meadows, Wendy
Meadville, Gerald and Dorothy
Meyers, Jim (*)
Michael, Gregory K.
Mihallik, Regis S.
Miladin, Benjamin
Mills, Ken
Minsterio, Marcos
Mitchell, Colleen
Mitchell, John
Mitolayana, Clair
Moore, Kristin
Morgan, David
Morgan, Katherine
Mosher, Brian (*)
Mueller, Jay
Mueller, Robert F., Ph.D.
Murowski, Susan
Myerson, Scott
Nalbone, Jennifer
Nannery, Valerie
National Wild Turkey Federation, Thomas B. Duncan
Neely, James
Neff, Terry
Neil, David
Nicola, Davis
Nielsen, Eric
Nikelsky, Joan
Noll, Frank
Northeast Hardwoods
Nunez, Ted
O'Connor, Jillian
O'Connor, William D.
O'Sullivan, Kevin
Ozone, Will
Paar, Deana L.
Paolini, Anna
Parana, Brian
Pastewka, Kenneth D.
Patton, Leith
Payne Forest Products, Inc., Donald Payne
Pennswood Village, Elizabeth Price, M.D.
Pennsylvania Forest Industry Assn., Dale Anderson
Penn State Cooperative Extension, Tim Pierson, County Agent
Perhac, Joseph
Perlstein, Abigail
Perlstein, David
Perry, Davis
Peters, Henry W.
Pillsbury, Beth
Pittman, Jason (*)
Plummer, Joseph D.
Poole-Karana, Holly
Price, Shane A.
Pryor, Tara Jane
Quinney Natural Resource Library, Utah State University
Racfled, Natalie
RAM Forest Products, Richard La Brozzi
Rayshick, Helen M. and Steven J.
Reade, David

Reese, Dan
Reese, Megan
Reinhardt, Chuck
Reynolds, John C.
Rice, Nathaniel
Richardson, Michael
Ridgeback, Ralph
Riley, Paul
Riviera, Antonio
Roland, Keri
Rooney, Thomas, University of Wisconsin
Rose, John
Rose, Doris L.
Rosin, Cindy
Rossey, William and Joanne
Ruff, Donna L.
Russell, Brady
Ryznab, Amanda B.
Salvador, Ronald A.
Sanding, Renee (*)
Schade, Michael
Scheurman, Karl
Schinhofen, Mary A.
Schlosser, Kolson (*)
Schoenbaechler, Eric
Schramm, Randie
Seibert, Saliten
Serjak, Theodore F.
Shepard, Mark F.
Shor, Ronald
Sierra Club, Jeff Schmidt
Sierra Club, Philip Coleman
Sierra Club, The Allegheny Group
Sierra Club, William Russell
Sierra Club, Blake Reeves, Ph.D.
Sierra Club, Niagara Group, James Rauch
Simpson, Walter
Sims, Thomas
Siplak, Sarah
Slatedale Rod and Gun Club, Warren F. Wanamaker
Sleeman, Edward
Judy Smith, Colorado State University Library
Smith, Rachel
Smokelin, Brooke (*)
Smythe III, William H.
Solczak, Amanda (*)
Spence, Dr. Robert
Spilka Wood Products, George and Timothy Spilka
Spooner, Shirley
Sprague, Michelle
Steffy, David Meade
Steiner, Linda
Steinmeyer, Pauline
Stem, Clay
Sterling, John
Stevens, Peter J.
Streit, Roger D.
Student Environmental Action Coalition, Eloise Kaizar
Stump, Bill
Styers, Ron
Sutherland, Michael
Swanson, David T.
Tanikawa, Ana
Teesdale, Suzanne L. (*)
Temple, Stacy
Temple, The AMLP Team
Tennessee Gas Pipeline, Conrad Grubbs
Tervo, Mindy
The Dean Company, Dan McCracken
Thomason, Alexis
Thompson, Robert
Todd, Laura D.
Tohey, Beverly A.
Toy, Bryan
Trainor, John D.
Trent, Kathryn A.
Trent, Nancy
Uncle Stump's Cabin, David N. Weiland
VanDyke, Gregory M.
Vangelo, Anthony
VanNostrand, Shawn
Vearen, Alisha
Venn, Arethusa
Vespole, Vincent
Villastrigo, Richard
Vine, Eva
Wainer, Heather M.
Waite, James
Waite, SGM Jerry P., Retired
Wakely, David
Walker, Ginette
Walters, Russell
Warner, Barbara H.
Warren, Timothy
Washa, Zachary
Watkiss, Tom
Weindel, Curtis
Weishampel, Nick
Weiss, Marissa
Weissman, Adam
Weksbiman, William
Wetlands Preserve, Emily N. Maxwell

Wetlands Preserve, William Swan
Wetlands Preserve, Marco Zarczanski
Wetlands Preserve, Andy Stepenian
White, Sidney
Wice, Richard B.
Wilkofsky, Randy M. (*)
Wilson, Richard C.
Wilson, Elizabeth
Winstead, Robert B.
Wirth, Mary
Witherell, Daniel B.
Woiccak, Mary Beth
Wong, San Y.
Wulf, Christina
Yarbrough, Jim
Yaroschak, William Sr.
Young, Mary
Zaino, Laura
Zalewski, Larry
Zavada, Paul
Zeigler, Alexis
Zimmerman, Dan
Zwerg, Mickey

OTHER PUBLIC NOTIFICATION FOR THE DRAFT EIS

A Notice of Availability of the Draft EIS for the East Side Project was published in the April 21 issue of the Federal Register. Also, a news release stating that the Draft EIS had been completed and was available for a 45-day public review/comment period was issued to over 200 media outlets. A form was included in the mailing to all individuals and organizations who received the DEIS or Summary to be returned if they were interested in receiving the FEIS or the ROD/Summary. The form also allowed people to choose a hard copy of the documents, a CD, or to access the document on the ANF web page. As a result, only those who commented on the DEIS or submitted the form requesting documents will be sent FEIS documents.

COMMENTS RECEIVED ON DRAFT EIS

During the 45-day public review/comment on the Draft EIS, 143 comment letters from individuals and/or organizations and 1 petition signed by 263 individuals were received. For a summary of the comments identified in those letters and Forest Service responses, see Appendix G.

Following close of the review/comment period, numerous letters (including form letters) and/or petitions were received. After careful review of each, it was determined that they contained no issues that had not been brought forth in those letters received during the comment period.

PUBLIC INVOLVEMENT FOR THE FINAL EIS

MAILING LIST FOR FINAL EIS

A copy of the Final Environmental Impact Statement, including Appendices, and the Record of Decision and/or a Summary of the FEIS were mailed to the following individuals and organizations (individuals marked with an (*) indicated they would get documents from ANF web site at www.fs.fed.us/r9/allegheny/forest_management/projects/index.html):.

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, John Forren

USDA-FS, Region 9
USDA-FS, WO, Environmental Coordination Staff
USDA National Agricultural Library
USDA Natural Resources Conservation Service, Barry Frantz
USDA Office of Civil Rights
USDA OPA Publications Stockroom
USDI Fish and Wildlife Service, State College Field Office
USDI National Park Service, William R. Menke
USDI Office of Environmental Policy and Compliance, Michael T. Chezik

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, Bob Steiner
Pennsylvania Game Commission, Robert W. Schlemmer
Pennsylvania Historic and Museum Commission, Paul Funk

Local/Regional:

Clinton County Commissioners, Dean Bottorf
Elk County Commissioners
Erie County Dept. of Health, Robert Wellington
Forest County Commissioners
Forest County Conservation District, Douglas E. Carlson
McKean County Commissioners
McKean County Planning Commission, Deborah Lunden
North Central PA Regional Planning and Development, Don Masisak
Ridgway Township, Milly Bowers (*)
Warren County Commissioners
Wetmore Township Supervisors, Elaine P. Bodistow

Businesses/Individuals/Organizations:

Aisenstein, Hillary
Aston, Charles
Aston, Jr., Charles E.
Allegheny Defense Project, Sean Damon
Allegheny Defense Project, Newkirk L. Johnson
Allegheny Defense Project, Jim Kleissler
Allegheny Defense Project, Rachel Martin
Allegheny Defense Project, Denise Roberts (petition with 263 signatures)
Allegheny Forest Alliance, Jack Hedlund, Executive Director
Allegheny Hardwood Utilization Group, Sue Swanson, Executive Director
Bachelder, Thomas W.
Balazs, Kevin
Bamford, Sherman
Belitskus, William M.
Bik, Tom
Bondar, Elisa
Bosman, Corrie
Brainerd, Bill
Braverman, Beverly
Brown, Casey
Brown, Paul M.
Caesare, Matt
Caputo, Linda & Sam
Carney, Apryle
Casacio, Joseph A.
Clarke, Rodger
Cook, Gale
Cornett, Douglas R.
Coyote Nation Press, Bill McLaughlin
Cross, Daniel M.
Curry, Susan
DeCarolis, Christine
DeCarolis, Janice M.
Denmarsh, T. Alexander

DeSabato, Jean
Devlin, Karan
DiPietro, Steve
Donham, Diane
Dukelow, Donald A.
Eckel, Frank
Egger, Ray
Fenner, Ray
Ferrigno, Meg
Freed, Mark
Fryer, Jeanne
Gallo, Eric
Gianni, Andrew
Griffin, Gwendolyn
Groff, Josiah
Group Against Smog and Pollution
Hammer, Lori
Haskins, Frances E.
Hathaway, Dev
Hathaway, Marie
Havrilla, Mary
Havrilla, Robert
Haworth, Holly
Heartwood, Jim Bensman
Heartwood, Devin M. Scherübel
Helsel, Stephanie
Hepinger, Michael F.
Hild, Henry
Hobson, Dr. John P. and Donna E.
Hughes, Shannon
Hutchins, Larry (*)
Johns-Richardson, Helen J.
Jones, Erin M.
Kaplan, Karyn
Kase, Tom
Kentucky Heartwood, Chris Schimmoeller
Keslick & Son Modern Arboriculture, John A. Keslick
King, Brian
Kinsman, Patricia
Knauer, Josh
Kolb, Gary
Koncsal, Kathryn
Kretschmann, Anne
Kruse, Michael
Kukla, Michael
Larson, Peter
Lazdins, Erik
Lehman, Victoria
Leslie, Robert
Light, Marty
MacAuley, IV, Ed
Marion County Water Watch, Barbara Warner (*)
Martello, Jeffrey
Martin, Joseph V.
McCormack, Stacy
McMahon, Brendan P.
Mitchell, John
Mueller, Robert F., Ph.D.
Murray, Jessica
Native Forest Network, Adam Rissien
Nickell, David
Noyes, Eric
Nuckles, Brooke
Orion, Kathleen
P, K. M.
Pennsylvania Forest Industry Assn., Dale Anderson
Perez, Nubia
Platzke, Fritz
Porcelli, Lori
Rain, Dan
Rancier Megan
Rauch, James M.
Redden, Danielle
Rhodes, Joseph C.
Riley, Paul S.
Rindilo, Kate
Roberts, Maurina
Roberts, Melissa
Schlee, Ray
Schraufnasel, John
Siess, Alfred A.
Sinatra, Carol
Southern Appalachian Biodiversity Project, Marty Berfoggen
Southern Illinois-RACE, Mark Donham
Southern Illinois-RACE, Kristi Hanson
Sullivan, Chris
Topping, Brian
Trevelyan, Amelia M.
Tseng, Joyce
Volk, Jeff
Walker, Ginette
Whayne, Sue
Wickelhaus, Martha
Wojculewski,Christy Ann
Wutchiett, Cynthia
Yambert, Carla & Paul
Zalewski, Larry
Zawadzkas, Peter

OTHER PUBLIC INVOLVEMENT EFFORTS FOR THE FINAL EIS

A notice of Availability for the Final EIS for the East Side Project will be published in the Federal Register. A notice of availablility of the FEIS will also be published in the Warren Times Observer. In addition, a news release will be released to media outlets stating that the Final EIS for this project has been completed and that a Record of Decision had been issued.

APPENDIX B
VEGETATION REPORT
FOR THE
EAST SIDE PROJECT

November 2000

TABLE OF CONTENTS

Page

BACKGROUND 1
Vegetation Associations 1
Natural Disturbance 1
Droughts 1
Harvesting 1
Deer Browsing 2
Recent Management Activity 2
Forest Health History 3
Private Land 8
FOREST PLAN DIRECTION 8
General Assumptions Used in Project Development 8
Project Development Objectives 9
PRESENT CONDITION WITHIN THE EAST SIDE PROJECT AREA 10
Forest Types/Age Class 10
Relative Density 12
Midstory/Understory 13
Consideration of Uneven-aged Management 15
Temporary Openings 20
Herbicide Block Size 22
East Side Present Condition Data 22
Present Condition Table Definitions 23
TREATMENT PROPOSALS 35
Development of the Proposed Action 35
Development of Alternatives 2 through 5 36
Alternative Treatment Table Definitions 37
EAST SIDE OUTCOME DATA 51
Outcome Table Definitions 51
CHANGES IN TREATMENTS BETWEEN DRAFT AND FINAL EIS DOCUMENTS 76
REFERENCES 81

VEGETATION REPORT

BACKGROUND

Vegetation Associations

The types of plant communities and plant associations found in the East Side project area have resulted from a combination of ecological processes and cultural activities. Early surveyor's records of the ANF suggest that the forest, prior to settlement by Europeans, consisted primarily of American beech (44 percent) and eastern hemlock (20 percent). Sugar maple, red maple, and white pine each represented 5 percent, and black cherry represented only 0.8 percent of the trees recorded in these early surveys (Whitney, 1990). In the late 1800s, the East Side project area most likely had a similar species composition before harvesting began. Hemlock was most abundant on moist sites along stream bottoms and poorly drained upland areas, and beech and maple were more abundant on better-drained sites. Where hemlock did not block out most of the light or decrease the soil pH, it is thought that the most common understory plants were hobblebush, maple-leaved viburnum, spinulose wood-fern, and shining club moss.

Natural Disturbance

Historically, wind (including tornados), drought, and ice were the primary disturbance factors. Significant damage occurred on the ANF from ice storms in 1936 and 1965. Small tornados and windstorms cause damage in the area every couple of years. The most severe damage in recent years occurred from one of the numerous tornados that touched down in northern Pennsylvania on May 30, 1985, blowing down several thousand acres within the project area. Fires occurred within the project area during the 1920's to 1930's following the period of heavy logging and accumulation of coniferous slash. Defoliation from insects, forest diseases, and browsing by hare and deer (common, but not abundant during the 1920s), were also undoubtedly part of the natural disturbance regime of the forest. Before 1900, natural disturbance attributable to insects and diseases came from native pests; since then exotic pests/diseases (chestnut blight, gypsy moth, beech bark disease complex, etc.) have played a major role in forest disturbance. While many forest stands were mature or overmature, the forest was composed of stands of different age and size classes due to these natural disturbances. The variability in stand structure and composition represented the various stages of recovery from past disturbance.

Droughts

The National Oceanic and Atmospheric Administration (NOAA) maintains the Palmer Drought Severity Index (PDSI) as an index of drought conditions across the United States. The index has been calculated for every year since 1896. The Allegheny National Forest is located in Region 10 of Pennsylvania. From 1896 through 1940, the mean June-July PDSI for this region fell below -1.0 (a moderate or worse drought) in 56 percent of the years. From 1940 through 1994, the mean June-July PDSI for the region fell below -1.0 only 20% of the time. In fact, from 1971 through 1988, there were no years in which the mean June-July PDSI fell below this threshold (NOAA 1995). However, since 1988, there have been three years where PDSI values were more negative than -1.0 (1988, 1991, and 1995). Thus it is apparent that there are long cycles of weather that affect forests (for example, drought had a heavy impact on hemlock in the 1930s). It is probable that these weather cycles interact with other natural and introduced stresses to impact overall forest health.

Harvesting

Harvesting began slowly in the early 1800's and accelerated in the mid to late 1800's, with the forest products being used for lumber. Agricultural use was limited because the unglaciated soils generally were too poor for profitable farming. Marquis (1975 and 1994a) has summarized historical logging and

disturbances which occurred on the Allegheny Plateau between the 1890's and the 1930's, including the East Side project area. Hemlock bark was used in the tanneries, and some of the smaller trees were used in the local distillate plants. Knowledge of these past cutting practices helps us understand how the present forest originated and developed. This provides insight into silvicultural practices that can be implemented successfully to produce desired vegetative conditions today. Many of the second growth stands within the project area originated from a series of cuts occurring from the late 1800's to the early 1900's. The first cut was usually for Hemlock; another entry was made for the remaining sawtimber sized material followed up very shortly by the removal of the remaining trees for chemical wood. This shelterwood-like sequence of cuts created even-aged stands with only a few scattered residuals. Each of these partial cuts was followed by a surge of advance reproduction that influenced the composition and character of the stands we have in the project area today.

Deer Browsing

Many of these cuts removed most, if not all, of the trees on a site, so a shift to shade-intolerant species occurred in many stands. Much of the project area became dominated by even-aged black cherry, red maple and other shade-intolerant or mid-tolerant tree species. The present even-aged forests developed during the period of ever increasing deer herds on the ANF. Deer herds were very small when the stands were in the stand initiation stage and increased dramatically to 40-60 animals per square mile during the pole-timber/small sawtimber stages. Deer browsing even today, with deer populations averaging 20-30 deer per square mile, limits our ability to successfully develop tree seedlings.

Deer browsing has had a major impact on the regeneration and development of forest understories and wildlife habitat (Tilghman, 1989, Jones, et al, 1993, deCalesta, 1994) on the ANF. This is true for the project area. Many of the second-growth species are dependent upon advanced regeneration. Because of extensive browsing by deer, advanced regeneration is usually absent. Other species (hay-scented and New York fern, grasses and sedges, beech root suckers, and striped maple) fill the growing space vacated by browsed seedlings, cast dense shade at the forest floor level, and interfere with the establishment and survival of tree seedlings.

Recent Management Activity

Much of the 139,990 acres of Federal land within the project area was acquired by the Allegheny National Forest during the 1930's. Few records exist about management of the area for the next 30 to 40 years. Custodial management occurred in many areas, though significant amounts of timber stand improvement, spraying to control defoliating insects, tree planting, and commercial tree harvesting did occur. An undetermined amount of browse cutting occurred in the 1960's and 1970's. This involved cutting smaller diameter trees during the winter to create food for deer. Table 1 displays the amount and kinds of activity that have occurred within the project area since 1986.

Table 1. ANF Management Activities within the 139,990-acre East Side Project Area - 1986 to 1998

Activity	Acres
Harvest Treatments (1986-1998)	
Even-aged Final Harvest	11,765
Shelterwood Seed	5,005
Two-age Prep	66
Two-age	549
Uneven-age Prep	24
Uneven-age Selection	2,408
Intermediate Thinning	16,728
Salvage Thinning	4,570
Reforestation Treatments (1986-1998)	
Planting	188
Fencing	2,669
Herbicide	6,885
Site Preparation for Natural Regeneration	6,047
Site Preparation (Striped Maple Cutting)	1,768
Fertilization	5,800
Release/Timber stand improvements	1,230
Certification of Regeneration in Final Harvest Areas	10,576
Wildlife Habitat Improvement (1990-1998)	
Create/Manage Upland Opening	285
Regenerate Aspen	22
Seeding	206
Planting	1,570
Fence	1,125
Release (Hemlock and Shrubs)	581
Pruning	559
Structures (each)	238
Insect Suppression (Biological Insecticide) (1986-1998)	67,491

Forest Health History

Ecosystems are dynamic; change is inevitable. Across the landscape, a healthy forest renews itself vigorously and is resilient to a wide range of disturbances. It is characterized, both physically and biologically, by diversity of composition, structure, and function - including a variety of genes, species, plant and animal communities, and complex dynamic processes, all of which are interconnected through space and time. Within this ecological context, healthy forests are sustainable while providing for current and future human needs across a continuum of values, places, uses, services, and objectives (USDA Forest Service, Dec 1995b).

A large number of stressors have affected East Side project area ecosystems. When viewed across the landscape and over time, they have contributed to current health of these ecosystems. The following discussion briefly summarizes them.

1. As was mentioned in the previous section, forest stands within the project area are primarily even-aged and second- growth, a result of the harvesting carried out in the late 19th and early 20th century. The age, structure, and maturity of the resulting forest are fairly uniform. As trees mature, they

naturally become more vulnerable to insect and disease infestations. The death of individual trees provides light and growing space for the remaining trees to use, or it provides an opportunity for tree seedlings to develop. Dead trees furnish dead and down material on the forest floor, important for nutrient recycling and as a component of wildlife habitat. Under natural conditions, a forest would be composed of different tree age classes resulting from growth response to natural disturbances (wind, fire, insects, diseases, etc.) and individual tree mortality. Trees over 70 years old occupy 87 percent of the East Side project area. This uniform mature forest is more vulnerable to damage from repeated natural stresses (droughts, late spring frosts, open winters, native defoliators such as elm spanworm and forest tent caterpillar) and exotic insects or diseases (beech bark disease complex, pear thrips, gypsy moth). When excessive deer browsing and interfering plants severely limit tree seedling development and growth, healthy young trees may not replace trees that die, interrupting the natural cycle which normally maintains continuous forest cover on the land.

2. Between 1965 and 1985, (USDA-FS 1985) insects and diseases had an impact on the Eastside project area. Substantial insect defoliation has occurred since 1985, and the average level of defoliation appears to have exceeded that which occurred between 1965 and 1985. American Beech in the project area has been suffering decline and mortality from the impacts of the Beech Bark Disease complex (an exotic pest). In the mid-1990's, a substantial portion of the project area was sprayed with a biological insecticide (bacillus thuringiensis) to help reduce defoliating insect damage to tree crowns and to help reduce the potential for tree mortality to develop. Without spraying, tree mortality/decline would have been higher. Severe droughts have occurred within the project area three times in the past decade, in 1988, 1991 and 1995. The project area is unglaciated and predominantly on plateau top topographic positions. Nutrient demanding species, like sugar maple and white ash, are more vulnerable to drought and defoliation stress on sites with low nutrient capital, like unglaciated plateau sites in the project area. Decline in these species is evident (Horsley and Long 1999). The ANF FY 97 Monitoring and Evaluation Report (USDA-FS 1998) provides a Forest Health summary for the ANF, much of which applies to the project area. Table 2 summarizes the defoliation and spraying activity that has occurred within the project area between 1986 and 1998. Little defoliation is anticipated during 2000.

Table 2. Summary of Insect Spraying and Naturally Occurring Stresses on Forest Vegetation - East Side Project Area (1984-1999)[1]

	Acres Defoliated								
STRESS EVENT	**1986**	**1987**	**1988**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**
Gyspy Moth	92		70						
Severe Drought [2]			X	X				X	
Elm Spanworm				17,099	23,886	126,783			
Elm Spanworm and late Spring frost					13,457				
Cherry Scallopshell Moth						701	17,990	88,146	4,734
Pine Budworm							1,014		
Forest Tent Caterpillar						3,919	7,716		
INSECT	**Acres Sprayed [3]**								
Gypsy Moth		610	655						
Elm Spanworm							39,031		
Forest Tent Caterpillar								32,046	

1 In the East Side Project Area, there were no acres defoliated or sprayed in the years 1984, 1985, 1989, 1990, and 1997 through 1999.

2 Palmer Drought Severity Index below -1.0.

3 Using biological insecticide Bacillus Thuringiensis var. Kurstakii.

A substantial portion of the East Side project area was repeatedly defoliated during the six year period between 1991 and 1996 (see Table 3). Close to half of the area has been defoliated two or more times, and almost one-quarter of it has suffered three or more defoliations. This is particularly significant given the two severe droughts that also occurred during the same period. These repetitive stresses serve to weaken the trees and make them much more susceptible to attack by secondary pathogens which actually kill the trees.

Table 3. Cumulative Defoliation within East Side Project Area 1984 through 1999

# of Years Defoliated	Acres	% of Total Project
0	6,384	4
1	36,728	24
2	74,340	48
3	30,063	19
4	6,299	4
5	1,067	1

In summary, the last 15 years have been a period of high stress for forests in the project area. Near annual defoliations, often of tens of thousands of acres, have been compounded by droughts occurring more frequently than in the recent past. Nutrient capital, already low on plateau top sites, may have been further reduced by acid deposition. Sugar maple, a key species in the project area, is less resilient to stress on sites low in magnesium and calcium in this area (Horsley et al, in press).

3. For as long as the Pennsylvania Atmospheric Deposition Network has maintained records (since 1982), the region of the Allegheny National Forest has received heavy inputs of sulfate and nitrate through wet deposition. Since the passage of the Clean Air Act, sulfate concentrations and wet depositions have decreased somewhat. In contrast, nitrate concentrations and wet depositions have not declined. The mean growing season nitrate concentration measured at the Kane Experimental Forest during the period 1982-1997 was 1.91 mg./L., while the sulfate concentration for the same period was 3.67 mg./L. The total estimated deposition of nitrate at the Kane Station in 1997 was 20.98 kg/ha of nitrate, and 26.07 kg/ha of sulfate (Lynch et al., 1998). In New England, deposition with similar characteristics on soils poor in base cations has been associated with accelerated soil acidification (Likens et al., 1998), which is associated with leaching of base cations from the soil. Locally, sugar maple decline has been associated with two or more moderate to severe defoliations within a decade on sites with low levels of base cations, especially magnesium and calcium (Horsley et al., 1999). Thus while no local evidence directly links atmospheric deposition with forest health problems, research results from elsewhere suggest that atmospheric deposition may contribute to the problem.

4. Dead and declining trees are very evident throughout the project area. McWilliams et al (June 1996) evaluated inventory data from 340 stands on 8,343 acres of the Allegheny National Forest, primarily within what is now the East Side project area. In the summer of 1994, ANF personnel or contractors collected detailed stand data on these sites that were among the hardest hit by tree decline and mortality. Data collected included information about overstory and understory vegetation.

   McWilliams (1996) described stand structure and composition, and the status of tree seedlings and interfering plants on the areas examined. Across all 340 stands, 12 percent of the total basal area per acre was in dead trees and 16 percent was in trees at high risk of mortality (Figure 1). For sugar maple, 59 percent of the basal area was dead or at risk of dying. "At risk of dying" meant they had lost enough of their normal crown such that it is probable they would die. Prior to recent mortality, sugar maple was the dominant species in these 340 stands; now it ranks third behind black cherry and red maple. Beech and red maple were the other important decline species, with 28 and 20 percent of

their basal area dead or at risk, respectively. Adequate numbers of tree seedlings were present in only 8 percent of sampled stands. Vegetation that interferes with tree seedling development and growth was present in sufficient quantities to require treatment in 90 percent of the stands examined. Sparse regeneration, tree mortality and decline, and the abundance of interfering vegetation raise serious concerns about tree seedling development and survival as well as the maintenance of forest cover on these sites.

In 1999 McWilliams and others updated this analysis to include an additional 529 stands (10,533 acres), primarily located within what is now called the Eastside project area, which showed substantial symptoms of tree decline. Stand data was collected in this second group of stands in 1995 and 1996. This second group of stands inventoried was believed to contain lesser amounts of dead and dying trees.

When analyzed together, the 1994, 1995, and 1996 data collected included 869 stands (18,876 acres) and represents a fairly large, site-specific inventory and independent analysis of conditions within the project area on sites where tree mortality and decline is most evident. Figures 1 and 2 below display the results of this larger area analysis by tree status and species group. Dead trees and trees at risk of dying account for 18.7% of the total basal area in this larger sample while they accounted for 28% of the total basal area in the smaller sample which was known to include areas where tree decline was more severe.

Figure 1. Percent of Basal Area by Tree Status for Stands with no Significant Forest Decline Symptons on the Allegheny National Forest.

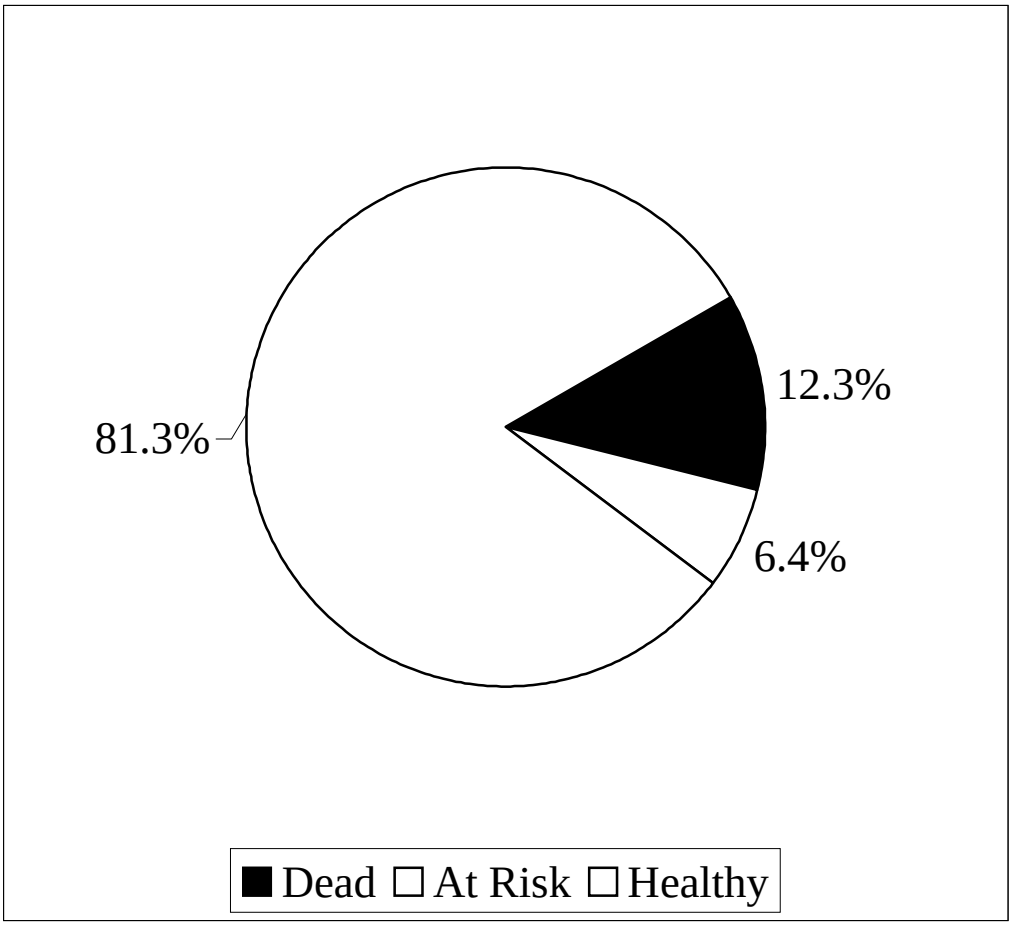
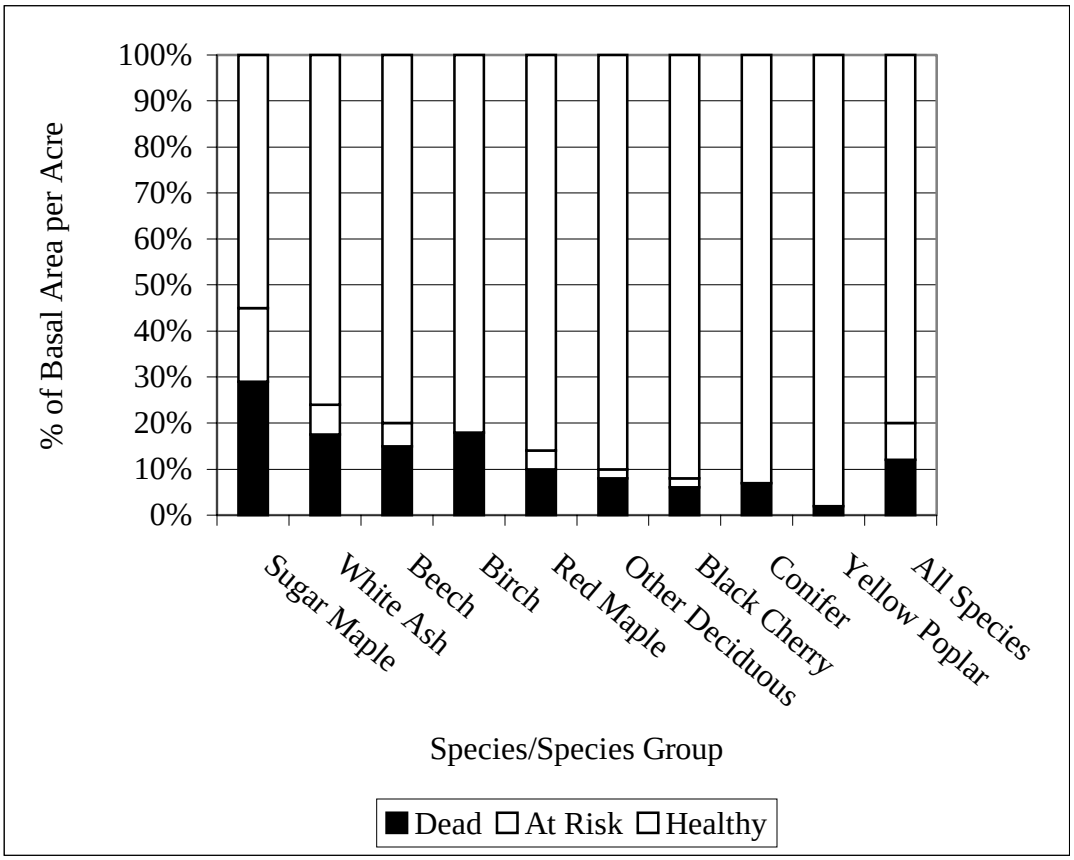


Figure 2. Percent of Basal Area Per Acre by Tree Status/Species Group for Stands with Significant Forest Decline symptoms on the Allegheny National Forest.



This expanded analysis also served to confirm the understory vegetation analysis described above. Adequate numbers of tree seedlings are present in only 8 percent of sampled stands. Vegetation that interferes with tree seedling development and growth is present in sufficient quantities to require treatment in 93 percent of the stands examined. Sparse regeneration and the abundance of interfering vegetation continue to raise serious concerns about tree seedling development and survival as well as the long-term maintenance of forest cover on sites where tree mortality and decline are or may become most severe.

5. Tree death is part of the life cycle of any forest. Why have so many trees died or why are so many in danger of dying now on the Allegheny National Forest? MacKenzie and Acciavatti (USDA-FS 1995b, Appendix D) suggest the answer is, in part, based on understanding the roles that numerous coinciding stress factors have in tree decline.

   Certain stresses, such as unusual droughts, initially may make trees susceptible (predispose them) to other secondary stresses. These secondary stresses (inciting factors) further weaken trees because trees are forced to use their energy reserves to survive. Being in a weakened state, trees can then be attacked by other insects and diseases that will eventually kill them (contributing factors). (Acid rain may play a role in forest decline, but that role has not been determined for the ANF.) When these factors happen over a wide area, it sets the stage for natural catastrophic conditions to occur (USDA – FS 1995b).

6. In FY 1990, Forest Health Protection personnel from Morgantown, WV, established 30 permanent plot clusters on all Ranger Districts to monitor pear thrips and maple decline. Since then, trees have

been evaluated annually on the basis of crown dieback, leaf dwarfing, foliage transparency, and foliage discoloration. Sugar maple mortality through 1997 is much higher than the average sugar maple mortality observed from 1989 through 1994 in similar plots located throughout the Northeastern U.S. and Southeastern Canada. In fact, the ANF rate is three to four times higher. (ANF 1998a, pp. 33-34)

Private Land

Trees on adjacent private land within the East Side project area have been equally affected by the stresses described above. They have experienced similar levels of mortality and decline, though perhaps somewhat higher in areas where defoliation has been more severe. The current increase in tree mortality and the increase in the number of trees that have poor live crowns are occurring predominantly among hardwood species. While sugar maple has generally been healthy in the five-state region around the ANF, it is declining in certain places, including the four-county area within which the ANF is located (USDA, 1995b). The relative stocking of sugar maple in these counties (Elk, Forest, McKean, and Warren) has declined 0.12 percent between the 1978 and 1989 statewide forest inventories. Landowners have completed a substantial amount of salvage harvesting of dead/declining trees.

An analysis of data collected on 248 plots containing sugar maple installed by the U.S. Forest Service Inventory and Analysis Unit across the northern tier of Pennsylvania during the 1987-89 survey of Pennsylvania identified 25 declining plots, or about 10 percent (Drohan et al., 1999). There were a slightly, but not significantly, higher proportion of declining plots within the unglaciated portion of the northern tier than in the glaciated portion. Thus the sugar maple decline problem extends across northern Pennsylvania.

FOREST PLAN DIRECTION

General Assumptions Used in Project Development

The Forest Plan contains the general management direction and silvicultural philosophy used in the development of this project. Some general assumptions apply to this project.

The Forest Plan is based upon an extensive analysis that considered a broad range of silvicultural management techniques. Forest Plan direction indicates the silvicultural system to be employed within a given Management Area and Forest Plan outputs are predicated by that silvicultural system. The proposed action is developed in consideration of the Forest Plan direction and will therefore propose silvicultural systems as outlined in the Plan. Different silvicultural systems can be considered as an alternative to the proposed action if issues developed for the project indicate that such analysis is needed. Given this assumption, the proposed action is based on the following:

- Uneven-aged management is the preferred silvicultural system in MA 2. (Forest Plan, USDA-FS 1986, p. 4-70)
- Even-aged management is the preferred silvicultural system in MA 3. (Forest Plan, USDA-FS 1986, p. 4-82)
- Silvicultural systems that promote the development of mature and over-mature forest condition (i.e., late successional habitat) will be utilized in MA 6.1. (Forest Plan, USDA-FS 1986, p. 4-110)

Regardless of the management area, East Side project proposals will maintain forested cover in areas where forested cover existed (pre-mortality) or exists, unless site-specific objectives for the development of wildlife habitats are indicated. The present condition data, considered in context with the Desired Future Condition, will be the basis for the proposed action.

Project Development Objectives

There are several primary objectives considered in the development of treatments for the East Side project area.

Forest sustainability - Areas within the East Side zone have been severely impacted by tree mortality and decline. Existing understory and midstory structure present in most stands will not result in the re-establishment of forested stands, comparable to those that were present before the onslaught of decline. Management options for these stands include reforestation treatments that are designed to re-establish forest cover combined with either even-aged or uneven-aged regeneration harvests. The number of dead trees found in these areas far exceeds that which is required for wildlife habitat needs.

In some cases, areas that fall below 40% healthy relative stand density exceed 40 acres in size. In other cases, areas that fall below 40% healthy relative stand density are located next to existing temporary openings. In both cases, areas that have been impacted by catastrophic damage (tree mortality) are not subject to the temporary opening size limitations indicated in 36 CFR 219.27(d)(2).

The multiple objectives of the Forest Plan (to sustain forested ecosystems, to provide a variety of wildlife habitats, to establish a range of age classes and successional stages and to provide quality wood products) can be achieved in these stands.

Salvaging dead and dying trees - Areas within the East side zone have been moderately and slightly impacted by tree mortality and decline. There is an opportunity to salvage the dead and dying volume in many stands. This volume can contribute towards the outputs anticipated from MA 3 in the Forest Plan. The numbers of dead trees found in these areas far exceeds that which is required for wildlife habitat needs. The multiple objectives of the Forest Plan (to provide a variety of wildlife habitats and to provide quality wood products) can be achieved in these stands.

Achieving the age class distributions outlined in the Forest Plan - There are many stands within the East side project that can be considered for regeneration at this time. Overall, the present age class distribution found within MA 3 does not meet Forest Plan expectations (FEIS, USDA-FS 1986, p. 4-94). Additional acres are needed in the 0-10 year age class in order to more closely achieve age class distribution goals.

Age class objectives can be met by applying reforestation treatments designed to establish seedlings along with even-aged regeneration treatments. A wide range of Forest Plan expectations are met by achieving age class distributions. Age class diversity contributes towards wildlife habitat goals and landscape objectives. The completion of timber harvests associated with even-aged regeneration treatments contributes towards the volume and values expectations for MA 3.

The selection of specific stands to meet age class objectives considers several factors:

- Landscape position of a stand/proximity to other young stands (stands regenerated to meet landscape/Forest Plan age class distribution needs are subject to temporary opening guidelines included in 36 CFR 219.27(d)(2).
- Stand condition/age
- Presence or absence of regeneration or understory interference

In the East Side zone, given the number of stands that are in a lower than normal state of stocking due to mortality, consideration for regeneration has been based on healthy relative stand density. When landscape 0-10 year age class objectives need to be met, stands to be regenerated will be selected from those with the lower healthy relative stand density as long as other landscape considerations (NFMA 40 acre maximum temporary opening size) can be met.

Maintaining healthy forested stands that achieve long-term Forest Plan vegetative management objectives – Stands are considered to be over-stocked when healthy relative stand density exceeds 80%. Treatments such as intermediate thinnings that reduce relative stand density to 60% result in a condition that allows for vigorous tree growth to occur. Stands with understory vegetation that prohibits the establishment and growth of tree seedlings will not achieve long-term management goals. Regeneration treatments that promote the growth and development of seedling understories assure that long-term sustainability occurs.

The multiple objectives of the Forest Plan (to sustain forested ecosystems, to provide a variety of wildlife habitats, to establish a range of age classes and successional stages and to provide quality wood products) can be achieved in these stands.

Achieving wildlife habitat objectives – Providing the elements of quality wildlife habitat is an important aspect of Forest Plan implementation. Retaining snag and den tree components within all treated stands, protecting sensitive habitats as part of mitigation of treatments, and the development of wildlife habitats are all integrated in East Side treatments. Several stands have been selected to be developed as wildlife openings in this project. These stands will contribute towards Forest Plan wildlife objectives.

PRESENT CONDITION WITHIN THE EAST SIDE PROJECT AREA

Forest Types/Age Class

There are three forest types that predominate the East Side project area - Northern hardwoods, Allegheny hardwoods, and upland hardwoods – which collectively occupy 85% of the project area. Tree species commonly found in the project area include black cherry, white ash, tulip poplar, red and sugar maple, black and yellow birch, American beech, quaking aspen, red and white pine, white and Norway spruce, and hemlock. Table 4 and Table 5 display the vegetation types and age-class distribution of National Forest System lands within the project.

Note that MA 3 appropriately contains a much higher proportion of Allegheny hardwoods (48%) than does MA 2 (14%), or MA 6.1 (29%). MA 2 has double the proportion of Northern hardwoods than the average for the project area, and almost three times the proportion in MA 3. This distribution is appropriate given the emphasis on even-aged management in MA 3 (which favors shade-intolerant species such as Allegheny hardwoods) and uneven-aged management in MA 2 (which favors shade tolerant species in the Northern hardwood type) .

Almost all of the project area and all of the treatment sites are even-aged, a result of the extensive clearcutting that occurred during the first three decades of the twentieth century. Some stands where beech (or in a few instances hemlock) is beginning to sprout in the understory have the beginnings of a second age class. With beech bark disease complex present, beech is unreliable as the main source of tree seedlings for a second sustainable age class. Many stands contain a variety of tree size classes that are not indicative of a different age class; those smaller trees were just slower growing and in many instances are the same age as the larger trees.

Table 5 shows the Eastside project area age class composition by management area. Three-fourths of the project contains stands that are 51 to 110 years old. Approximately 3% of the project area is older than 111 years, with the majority of that in MA 8 (Tionesta Scenic Area and Tionesta Research Natural Area). Almost all (97%) of the project area consists of forest cover, with the remaining 3% in openings. Only 11% of the project area is less than 20 years old, with MA 3 slightly higher at 13%.

Table 4. East Side Project Area Forest Type/Management Area Summary

	MANAGEMENT AREA									
	MA 2.0		MA 3.0		MA 6.1		MAs 6.2, 7, 8		Project	
FOREST TYPE	**acres**	**% of MA**	**acres**	**% of MA**	**acres**	**% of MA**	**acres**	**% of MA**	**acres**	**% of project**
Red pine	10	1%	2,090	2%	522	5%	32	0%	2,653	2%
White pine	5	0%	7	0%	0	0%	0	0%	13	0%
White pine/Hemlock	0	0%	0	0%	17	0%	0	0%	17	0%
Hemlock	0	0%	1,467	1%	188	2%	103	1%	1,758	1%
Conifer (undifferentiated)	0	0%	133	0%	0	0%	0	0%	133	0%
Tamarack	0	0%	66	0%	0	0%	0	0%	66	0%
White and Norway Spruce	0	0%	184	0%	266	3%	0	0%	450	0%
Northern red oak	0	0%	0	0%	75	1%	0	0%	75	0%
Oak/Hardwood transition	0	0%	31	0%	8	0%	0	0%	39	0%
Red maple (wet site)	9	1%	1,059	1%	8	0%	26	0%	1,103	1%
Mixed Lowland Hardwood	143	9%	1,690	1%	288	3%	13	0%	2,134	2%
Northern hardwood	511	31%	14,395	12%	3,493	33%	3,684	31%	22,083	16%
Allegheny hardwood	232	14%	55,700	48%	3,090	29%	4,743	40%	63,766	46%
Red maple (dry site)	0	0%	6,539	6%	289	3%	236	2%	7,064	5%
Sugar maple	0	0%	263	0%	0	0%	0	0%	263	0%
Beech	15	1%	187	0%	0	0%	6	0%	208	0%
Black Birch	30	2%	74	0%	0	0%	652	6%	756	1%
Mixed Upland Hardwood	544	33%	28,355	24%	1,849	18%	2,004	17%	32,751	23%
Aspen	6	0%	275	0%	44	0%	0	0%	325	0%
Unknown	76	5%	510	0%	16	0%	0	0%	603	0%
Total acres of forest cover	1,581	97%	113,027	97%	10,154	96%	11,499	97%	136,261	97%
% forest cover of project area		1%		81%		7%		8%		%
OPENING										
Lowland shrub	0	0%	326	0%	87	1%	3	0%	416	0%
Upland Shrub	0	0%	82	0%	54	1%	16	0%	152	0%
Opening	57	3%	2,548	2%	242	2%	314	3%	3,160	2%
Total	57	3%	2,956	3%	383	4%	332	3%	3,729	3%
Total Project Acres By Ma	1,638		115,984		10,537		11,831		139,990	
% Of Total Project Area		1%		83%		8%		8%		100%

Table 5. East Side Project Area Age Class/Management Area Composition

	MANAGEMENT AREA									
	MA 2.0		MA 3.0		MA 6.1		MAs 6.2, 7, 8		Project	
AGE CLASS	acres	% of MA	acres	% of MA	acres	% of MA	acres	% of MA	acres	% of project
0-10	0	0%	6,444	6%	31	0%	800	7%	7,275	5%
11-20	41	3%	7,775	7%	159	2%	680	6%	8,656	6%
21-50	94	6%	7,402	6%	496	5%	627	5%	6,819	6%
51-110*	1,416	86%	89,602	77%	9,386	89%	5,898	50%	106,302	76%
111+	30	2%	614	1%	49	0%	3,494	30%	4,187	3%
Unknown	0	0%	1,190	1%	33	0%	0	0%	1,223	1%
Total acres of forest cover	1,581	97%	113,027	97%	10,154	96%	11,499	97%	136,261	97%
% forest cover of project area		1%		81%		7%		8%		%
OPENING	57	3%	2,956	3%	383	4%	332	3%	3,728	3%
Total	1,638		115,984		10,537		11,831		139,990	100

**** 32,302 acres or 30 % of this age class is currently 91 to 110 years old, 57% is 71 to 90 years old, and 13% is 51 to 70 years old.***

According to the information presented in Table 6, 97% of the acres treated in this project are 51 to 110 years old. One third of those acres are Allegheny hardwoods, and over half are upland hardwoods and red maple. All of these types thrive and produce high quality hardwoods under even-aged growing conditions (the conditions currently present on the sites). This table also indicates that only two percent (180 acres) of the treatment areas are 111+ years old. Over 19% (1,579 acres) of the proposed treatment areas are 91 to 110 years old, the age class that would move into the older category (111+ years old) within the next 20 years. But in the context of the entire project area, these 1,579 acres are only 5% of the total 91 to 110 year age class (32,302 acres, see Table 5).

Table 6. East Side Project Treatment Areas - Summary (acreage) of Present Age Classes

Forest Type	Age Class				
	11-20	21-50	51-110	111+	Total
Red pine			562		562
Tamarack		28	2		30
White & Norway Spruce			57		57
Northern hardwoods			581	117	698
Allegheny hardwoods	52	11	2,568	30	2,661
Red maple		12	1,246	27	1,285
Sugar maple			20		20
Beech	3		11		14
Upland hardwood		17	2,873	6	2,896
Total	***55***	***68***	***7,920****	***180***	***8,223***

****1,579 ACRES PROPOSED FOR TREATMENT ARE 91 TO 110 YEARS OLD***

Relative Density

Most of the areas proposed for treatment have experienced low levels of tree mortality/decline. More substantial changes have occurred in the forest canopy vegetative structure of the areas proposed for salvage treatment. The mostly closed dense overstory canopy of mature hardwood stands has been opened; the extent of the openings depends on the number of trees that have died or are dying. In severe mortality areas, the crowns of the remaining trees will not grow sufficiently to close the gaps. Trees will

not fully utilize the available site. Before mortality began to develop, over 75% of the proposed treatment acres had relative densities greater than 60% (Table 7). A full ninety six percent had relative densities greater than 40%. Presently, only 55% have relative densities greater than 60%, and only 75% exceed 40% relative density.

Table 7. East Side Project Treatment Areas - Changes in Stand Relative Density Resulting from Tree Mortality/Decline

Relative Density	Healthy Tree Component of the Stand	
	Present Condition	Pre-mortality/Decline (~1993)
unknown*	0	179
0-15%	30	30
16-40%	2,025	121
41-59%	1,620	1727
60-79%	2,491	3106
>79%	2,057	3060
Total	***8,223***	***8,223***

**** Adequate data is not available to describe the healthy tree component in ~1993.***

Midstory/Understory

As a result of browsing associated with high deer populations for over the past 60 years, forested stands throughout the project lack the understory conditions that normally would result from natural disturbances. Past deer browsing has virtually eliminated the shrub understory in much of the area and most likely has reduced the number of herbaceous plants, including some wildflowers. Deer browsing of desirable native plants has also resulted in encroachment of interfering vegetation such as ferns, grasses, beech or striped maple. When those desirable native plants were removed or died, interfering plants moved in to occupy much of the vacant growing space. Recent, site-specific, understory vegetation data is not available for every stand not proposed for treatment within the 140,000-acre Eastside Project area. However, understory vegetation data collected in 1992 at 6,000 plots throughout MA 3 on the ANF indicates the average conditions listed in Table 8 exist Forest-wide (USDA-FS 1995a, p 25-26). This is the best and most current estimate available of the understory conditions that exist throughout the East Side project area, though field observations indicate the estimate of interfering plants may be a bit conservative, and the seedling estimates a bit optimistic.

When interfering plants are this abundant, local information indicates tree seedlings have a limited ability to become established. Many other desirable native plants (including shrubs and some wildflowers) are most likely similarly affected. Plant diversity has been reduced. When tree seedlings are not present on the ground and their development is severely restricted by interfering plants, natural catastrophic events (such as tree mortality) threaten tree and forest sustainability. It is very difficult for vigorous young trees to grow from seed, gain dominance over the interfering plants, and replace trees that die.

Stands proposed for treatment in this project include many sites having substantial amounts of interfering plants (Table 9). Based on guidelines developed through local research (Horsley et al, in Marquis, 1995, p. 216), ninety percent of the sites have enough interference to limit development of tree seedlings and other herbaceous vegetation, compared with an estimated seventy percent throughout MA 3 in the rest of the project area (see Table 8). Interference on the treatment sites consists primarily of ferns and grass, although on close to one-third of the areas the interference also includes beech and striped maple. Even if we only consider those stands that are already very well stocked with interfering plants ($\geq$ 80 % of plots stocked), almost two-thirds of the stand acres meet this criteria. In summary, interfering plants are extremely abundant on the proposed treatment sites...abundant enough to significantly limit development of tree seedlings and desired herbaceous plants.

Table 8. Summary of MA 3 Understory Vegetation Conditions on the ANF from Plot Data Collected on 6,000 Plots in 1992*

Category	1992 Plot Data
% of MA 3 having Interfering Plants	70%
• By overstory stocking category	
Well-stocked	66%
Moderately-stocked	79%
• In riparian areas	70%
% of MA 3 Having Adequate Tree Seedlings	23%
• Black Cherry Seedlings	20%
• Other Species of Tree Seedlings	3%
• In Riparian Areas	10%
• By Overstory Stocking Category	
Well-stocked	18%
Moderately-stocked	29%

**** Source: (ANF, 1995, Tables 11 & 12, pp 25-26)***

Table 9. East Side Project Treatment Areas - Present Stocking of Plants Which Interfere with Tree Seedling Development

	≥ 30% of Plots Stocked		≥ 80% of Plots Stocked	
Interfering Plant Category	**Acres**	**% of Total Project ***	**Acres**	**% of Total Project ***
Fern/Grass	7,001	85	3,743	46
Beech/Striped Maple	2,544	31	289	4
Total Interference	7,377	90	4,960	60

**** Percent shown in this column reflects the proportion of the total project treatment acres (8,223 acres) in each interference category.***

Tree seedlings, however, are very sparse on the proposed treatment areas. As might be expected for areas where interfering plants are so abundant, tree seedlings adequate to maintain continuous forest cover exist on only 8% of the treatment sites (column 1 in Table 10 below). They are almost twice as abundant as the average on Allegheny hardwood sites, and virtually nonexistent on Northern hardwood sites. Birch seedlings (dense enough to interfere with the development of other tree seedlings and to completely dominate the understory of the site) are abundant on 10% of the treatment areas (see column 3 in Table 10), with the potential for much more to develop due to the seeding characteristics of birch. Birch has the ability to shade out or out compete other species, setting up the potential for a forest type conversion and domination of the site by a tree which on many sites becomes infested by nectria spp. (a canker which infects the main bole of the tree making it susceptible to snapping and other forms of rot).

Table 10. East Side Project Treatment Areas - Summary of Present Understory Woody Vegetation

	Adequate Tree Seedlings [1]		Midstory Canopy [2]		Birch Seedlings [3]		Forest Type
Forest Type	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Total Acres**
Red pine							562
Tamarack							30
White & Norway spruce							57
Northern hardwood	15	2	419	60	30	4	698
Allegheny hardwood	404	15	905	34	316	12	2,661
Red maple	64	5	313	80	115	9	1,285
Sugar maple							20
Beech			11	79			14
Upland hardwood	197	7	1,037	36	371	13	2,896
Total	***680***	***8***	***2,685***	***33***	***832***	***10***	***8,223***

1 Stand acres where > 70% of the plots in the stand are stocked with adequate numbers of tree seedlings s to reforest the site, if necessary.

2 Stand acres where > 30% of the plots in the stand are stocked with > 8 beech/striped maple seedlings per plot.

3 Stand acres where > 30% of the plots in the stand are stocked with > 8 birch seedlings per plot.

Consideration of Uneven-aged Management

Forest Plan direction established even-aged management as the featured silvicultural system in Management Areas 1, 3, and 6.2. Management Area 1 emphasizes early successional stages of vegetation and small diameter timber products (Forest Plan, Ch. 4, pp. 12, 60, and 64). Management Areas 3 and 6.2 emphasize production of high value, high quality, Allegheny hardwoods and oaks (Forest Plan, Ch. 4, pp. 11, 12, 82, 83, 125, and 126). In these management areas, uneven-aged management may be an option on inclusions, such as riparian areas, wet soils, or visually sensitive areas. Its use will be based on individual site analysis (Forest Plan, Ch. 4, pp. 87 and 131). Forest Plan Tables 4-13 (p. 4-84) and 4-19 (p. 4-127) reflect no UEAM acreage estimates since it was expected to be a minor part of total harvest activity. Uneven-aged management is the featured silvicultural system in Management Area 2 (Forest Plan, Ch. 4, pp. 12, 70, and 75).

When deciding which sites in a project should be considered for uneven-aged management, it is critical to know the characteristics of sites where it has a chance of being biologically successful. Uneven-aged management favors shade-tolerant tree species, and over the long term would cause stands dominated by shade-intolerant or shade mid-tolerant tree species to convert to shade-tolerant species (Stout in Marquis 1994b, p. 330; Marquis and Johnson in Burns 1989, p. 11). Without an adequate seed source, it would be either very difficult or very expensive (see Chapter 2) to establish shade-tolerant tree seedlings. The choice of silvicultural systems in Allegheny hardwoods would be wider were it not for the unusually high deer damage to regeneration on the ANF (Redding 1995; Tilghman 1989). Local silvicultural guidelines specify stands having 35 basal area of shade tolerant species as potentially providing an adequate seed source for uneven-aged management (Marquis et al 1992, p. 57), though local success with UEAM on these sites has been very marginal (USDA-FS 1997a, pp. 16, 17, 76, 77).

Logically, any stand having adequate shade-tolerant tree seedlings already present in the understory is also a potential candidate for uneven-aged management. Sugar maple, Eastern hemlock, and American beech are the only shade-tolerant tree species present in the project area. Of these, only American beech seedlings are present in sufficient quantity for the stand to be classified as having adequate numbers of shade-tolerant seedlings.

Approximately one-third of the sites proposed for treatment in this project meet one or both of the criteria

just mentioned (see last column in Table 11). Sites meeting either of these criteria are equally represented (at 20% each). These conditions are most frequently found (more than half of the forest type qualifies) on the following forest types: wet site red maple, Northern hardwoods, sugar maple, and beech.

Table 11. Acres by Forest Type that Meet UEAM Feasibility Criteria in Areas Prescribed for Treatment in Alternative 4

		Adequate Beech Regeneration		≥ 35 BA Shade Tolerant Species		Total with Beech and/or ≥ 35 BA	
Forest Type	**Total Acres**	**Acs.**	**%**	**Acs.**	**%**	**Acs.**	**%**
Red pine	561						
Tamarack	30						
White & Norway spruce	57						
Red maple	27	15	56			15	56
Northern hardwoods	699	405	58	271	39	494	71
Allegheny hardwoods	2,661	379	15	460	17	694	26
Red maple	1,258	195	15	87	7	259	21
Sugar Maple	20			20	100	20	100
Beech	14			14	100	14	100
Upland hardwoods	2,896	627	22	906	31	1,227	42
Total	***8,223***	***1,621***	***20***	***1,758***	***21***	***2,723***	***32***

Forest Plan analysis for the Allegheny National Forest took a very detailed look at the option of implementing uneven-aged management on a large scale on the ANF. The assignment of management areas, by their basic nature, sets guidelines on the breadth of consideration individual projects within those management areas should give to uneven-aged management. The results of implementing the Forest Plan during the last 13 years also provide an important context which helps frame the range of reasonable options for considering and implementing uneven-aged management locally. Has uneven-aged management been successful? Actually, reforestation success with uneven-aged management has been very marginal, whereas results with even-aged management have been quite good (USDA-FS 1998, pp. 18 and 86). Large scale implementation is not consistent with the objectives of certain management areas established by the Forest Plan, and it does not seem prudent until more is known about how to develop adequate tree seedlings of appropriate species. Additional details regarding uneven-aged management options can be found in Appendix F.

From Table 11, we learned there are 2,723 acres (32%) of the total 8,223 acres proposed for treatment in this project that have the biological characteristics which make uneven-aged management potentially feasible. Alternative 4 considers the most uneven-aged management of any alternative. It evaluates UEAM on 2,692 acres (99%) of the total area where it is biologically feasible (Table 12). In addition, three of the Alternatives include UEAM on 172 acres dominated by species or conditions that are not conducive to UEAM, but they are in MA 2 where UEAM is the featured silvicultural system. These treatments will be carefully monitored through adaptive management as a local test of its feasibility or results on these kinds of sites.

Table 12. Summary of Types of Sites where UEAM is Prescribed for Each Alternative

Alternative	Sites Meeting Biological Criteria for UEAM [1]	Sites Do Not Meet UEAM Biological Criteria	Total
1	274	172[3]	446
2	0	0	0
3	205	172[3]	377
4	2,692[2]	172[3]	2,864
5	0	0	0

1 Sites which lend themselves to UEAM, based on the biological capability of the tree species present, include those which have adequate stocking of beech seedlings or ≥ 35 Basal Area per acre of shade tolerant tree species.
2 Excludes 29 acres that meet UEAM criteria but only reforestation treatments, no harvest, are prescribed.
3 All of these acres are in MA 2. Individual tree selection is prescribed on 64 acres and group selection on 108 acres.

Riparian, Wet Soil, and Visually Sensitive Areas Proposed for Treatment

Table 13 displays the types and amounts of treatments proposed in riparian zones, areas with wet soils, and visually sensitive areas for the East Side Project. Total acres proposed for treatment range from 840 acres in Alternative 1 to a low of 415 acres in Alternative 2. Acres proposed for treatment in Alternatives 3 and 4 are similar (513 and 477, respectively). All of the harvest treatments in Alternatives 2 and 4 are partial harvests. In Alternatives 1 and 3, 79% and 71% of the harvests are partial, respectively. Over half of these treatments are proposed in visually sensitive areas.

As mentioned above, uneven-aged management may be an option on inclusions, such as riparian areas, wet soils, or visually sensitive areas. Only 846 acres (10% of total harvest acres) of these kinds of sites are proposed for harvest activity as part of this project (see Alternative 1 in Table 14. Other alternatives propose treatment on a much smaller acreage. Uneven-aged management is evaluated in detail on the portion (240 acres or 28%) of these areas where it is biologically feasible.

Table 13. Summary of Vegetative Treatments Proposed in Riparian Zones, Wet Soil (Soil Group III), and Visually Sensitive Areas Within the East Side Project Area

	TREATMENT BY ALTERNATIVE									
	ALT 1		ALT 2		ALT 3		ALT 4		ALT 5	
TREATMENT	**Green**	**Salv[2]**	**Green**	**Salv[2]**	**Green**	**Salv[2]**	**Green**	**Salv[2]**	**Green**	**Salv[2]**
Commercial Timber Harvest (even-aged)										
• Clearcut	14*	18			12*	18	9*			
• Shelterwood seed cut followed by shelterwood removal cut	47	94			30	80				
• Shelterwood removal cut		11				11				
• Delayed shelterwood removal cut	11	15			11	15				
• Intermediate thinning	29 0	23 9		4 15	73	20 4		225		
Total Even-age Mgmt.	***362***	***377***		***415***	***126***	***328***	***9***	***225***		
Commercial Timber Harvest (two-aged)										
• Two-age Prep Cutting followed by two-age cutting	33	26			3	14				
• Two-age cutting		41				41				
Total Two-aged Mgmt.	***33***	***67***			***3***	***55***				
Commercial Timber Harvest (uneven-aged)										
• Group Selection Cutting										
• Transition Cutting										
• Individual Tree Selection		1				1	43	197		
Total Uneven-age Mgmt.		***1***				***1***	***43***	***197***		
Total Harvest	***395***	***445***		***415***	***129***	***384***	***52***	***422***		
Total Green and Salvage Harvest	***840***		***415***		***513***		***474***			
No Harvest - Reforestation Only		***6***				***30***		***43***		

1 - "Green" final harvests are those conducted where stands are moderately to well-stocked with healthy trees (relative density > 40%). "Green" thinnings occur when more than half of the volume harvested consists of live, healthy trees.

2 - Salvage (salv) harvests consist of three types: 1) intermediate harvests in healthy stands where more than half of the volume removed consists of dead trees or trees at risk of dying, 2) final harvests in stands poorly stocked with healthy trees (relative density < 40%), and 3) in Alternatives 2 and 4, intermediate treatments in poorly stocked stands where the volume removed is dead or at risk of dying and the residual stand will remain poorly stocked.

** - Consists of wildlife opening development and aspen regeneration cutting.*

Table 14. Acreage Summary for Riparian Zone, Wet Soil (Soils Group III) and Visually Sensitive Areas Occurring Within Sites Proposed for Treatment In the East Side Project Area

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Total Treatment Acres	8,223	4,220	5,810	5,966	0
Treated Areas Having No Special Sensitivity	7,377	3,729	5,267	5,446	0
Treated Areas with Special Sensitivity	846	491	543	520	0
• Riparian[1]	102	59	65	66	0
• Wet Soils (Group III)[1]	299	196	114	157	0
• Visually Sensitive[1]	446	245	365	298	0
Treated Areas with Special Sensitivity	846	491	543	520	0
• UEAM Evaluated in Detail[2]	1	0	1	*240	0
• UEAM Not Evaluated in Detail	845	491	542	280	0

1 - These three special sensitivity categories listed are not mutually exclusive...therefore, acres listed are not additive.
2 - Sites were evaluated in detail for uneven-aged management because they have biological conditions that make UEAM reasonable to consider.

In order to reasonably maximize the evaluation of uneven-aged management on a larger acreage where it may be feasible, Alternative 4 includes detailed consideration on sites where it may be biologically feasible outside of these areas of special sensitivity. The ID Team has completed this evaluation even though MA direction features even-aged management. Ninety two percent of the treatment (5,966 acres) proposed in Alternative 4 is outside of these special areas (see Table 15).

Table 15. Sites Evaluated for UEAM - Summary of Their Acreage Distribution Between Areas With and Without Special Sensitivity *

		Portion of Sites Within Areas of Special Sensitivity		Portion of Sites Outside Areas of Special Sensitivity	
Alternative	Total Acres	Acres	%	Acres	%
1	446	1	0	445	0
3	377	1	0	376	0
4	2,864	240	8	2,624	92

**** No UEAM is prescribed in Alternatives 2 and 5.***

Status of Interfering Plants in Stands Prescribed for Uneven-aged Management

Interfering plants, such as fern, grass, and striped maple, are abundant on the sites proposed for uneven-aged treatment. In all of the alternatives, these species occupy close to 90% of the sites proposed for uneven-aged management (see Table 16). These plants interfere with seedling development, particularly sugar maple and hemlock, just as they do for even-aged management. Because sugar maple and hemlock grow slowly and are preferred as deer browse, it is especially important to control interference when practicing uneven-aged management.

Site-specific conditions within the East Side project area, current local and regional knowledge regarding the local feasibility of implementing uneven-aged management and Forest Plan direction used to determine where uneven-aged management is a viable management option for this project.

Table 16. Interfering Plants in Stands Prescribed for UEAM[1]

	Alt 1		Alt 3		Alt 4	
Total acres prescribed for UEAM	446		377		2,864	
	Ac	%	Ac	%	Ac	%
Type of Interference						
Fern/Grass	400	90	367	97	2,422	85
Striped Maple	0	0	0	0	440	15
Any Interference	421	94	377	100	2664	93
None[2]	25	6	0	0	200	7

1 ***Alternatives 2 and 5 contain no Uneven-aged Management. Acres shown in each category represent stands where ≥ 30% of the plots are ≥ 30% covered with interfering plants.***

2 ***None means < 30% of the plots are ≥ 30% covered with interfering plants***

Temporary Openings

Temporary openings are created by the application of even-aged regeneration treatments such as clearcuts, salvage clearcuts, shelterwood seed/removals, and two-age treatments. On the ANF, the size of temporary openings will generally not exceed 40 acres in size (36 CFR 219.27 (d)(2)), except where the size of harvest areas are the result of natural catastrophic conditions such as fire, insect and disease attack or windstorm (Forest Plan, p. 4-87). A temporary opening is no longer considered to be an opening when the height of the vegetation in the opening has reached 20 percent of the height of the surrounding vegetation. (Forest Plan, p. 4-12). Typically, this occurs within 13 to 15 years following the final harvest in even-aged treatments. Temporary openings that exceed 40 acres in size are not subject to Regional Forester review, pursuant to 36 CFR 219.27. As cited by 36 CFR 219.27 (iii), this requirement does not apply in instances where a catastrophic event has resulted in the need to harvest regeneration units greater than 40 acres in size.

Harvest activities that result in the development of temporary openings through the application of even-aged regeneration treatments are proposed in Alternatives 1 and 3. There are no temporary openings created in Alternatives 2, 4 or 5. Table 17 displays information pertinent to temporary openings created in Alternatives 1 and 3.

Table 17. Temporary Openings in Alternatives 1 and 3

	Alternative 1	Alternative 3
Number of Stands	200	148
Maximum Stand Size	62 acres	62 acres
Minimum Stand Size	2 acres	2 acres
Average Stand Size	16 acres	17 acres

There are five stands exceeding 40 acres in size in Alternatives 1 and 3 that have even-aged regeneration treatments proposed. In each case, the regeneration treatment is proposed as a result of the degree of mortality that exists within the stand and is considered to be the result of catastrophic damage. These stands therefore are in compliance with 36 CFR 219.27.

The combined effect of adjoining even-aged regeneration harvests can result in the development of temporary openings that exceed 40 acres in size. This situation develops when Eastside treatments occur in adjacent stands or when Eastside treatments occur adjacent to stands that are already considered to be a temporary opening, i.e., they are regenerating stands less than 15 years old. This occurs in Alternatives 1 and 3. It does not occur in Alternatives 2, 4 or 5. In some cases, the greater than 40 acre opening is the

result of only treatments that are proposed in the Eastside project. In other cases, the combination of Eastside proposals with already existing temporary openings results in blocks greater than 40 acres.

Table 18. Stands with Even-aged Regeneration Treatments in Alternatives 1 and 3 that Exceed 40 Acres

Compartment/Stand	Acres	Treatment Objective	Alternatives 1 and 3 Treatments
641/42	41	Salvage	Shelterwood Seed/Removal
871/66	42	Salvage	Shelterwood Seed/Removal
492/20	45	Salvage	Shelterwood Seed/Removal
445/9	55	Salvage	Shelterwood Removal
816/12	62	Salvage	Two-Age

There are 22 blocks with adjacent stand treatments in Alternatives 1 and 3 that cumulatively exceed 40 acres in size. These blocks include the five stands mentioned previously in Table 18. Table 19.

Table 19 displays the sizes of the various vegetation components within each block. The locations of East Side stands included in these blocks can be found on the East Side Outcomes Table (Table 24 of this Report). The 40-Acre Block column on Table 24 identifies the Block ID referenced in Table 19.

Table 19. Blocks where East Side Treatments Combined with Existing Stands Exceed 40 Acres.

Block ID	East Side Treatment Acres	Existing Acres 0-5 yrs old	Existing Acres 6-10 yrs old	Total Acres
1	41	0	0	41
2	114	38	0	152
3	96	15	0	111
4	45	0	0	45
5	46	40	0	94
6	22	63*	0	85
7	66	0	0	66
8	11	0	50*	61
9	18	32	0	50
10	16	0	31	47
11	34	0	38	72
12	47	23	0	70
13	40	0	9	49
14	49	0	0	49
15	27	0	21	48
16	32	0	14	46
17	41	7	0	48
18	67	8	0	75
19	52	0	32	84
20	56	0	45*	101
21	80	0	32	112
22	41	0	0	41

The existing acres shown here occur in more than one stand. Each stand is less than 40 acres in size, they do not adjoin each other, but the addition of an East Sside harvest unit in-between them creates a temporary opening of the size indicated in the last column.

Over time, the impact of temporary openings will decrease as vegetation grows taller, and forest canopies close in. In some cases, temporary opening size would decrease within 5-10 years following Eastside harvests. On the preceding table, this occurs in areas where East Side treatments occur adjacent to existing stands that are currently 6-10 years old. In other cases, temporary opening size would take 10 - 15 years before block size decreases. Openings created through East Side treatments would no longer be considered to be a temporary opening in about 15 years following harvest

Herbicide Block Size

There are eight individual stands larger than 40 acres where herbicides will be applied in Alternatives 1, 3 and 4 (Table 20). They range in size from 41 to 62 acres. In addition, there are 13 blocks (aggregates of adjacent stands) larger than 40 acres where herbicides will be applied in Alternatives 1 and 3, and 13 blocks in Alternative 4. Block sizes range from 41 to 215 acres. Treatments are proposed in combination with both even-aged and uneven-aged regeneration harvests, and in stands where no commercial harvest is proposed in Alternatives 1 and 3. Treatments are proposed in combination with uneven-aged regeneration harvests and in stands where no commercial harvest is proposed in Alternative 4.

Table 20. Herbicide Treatment Areas which Potentially Could Exceed 40 Acres

Herbicide Block ID	Alts 1 & 3	Alt. 4
H1	96	93
H2	41	41
H3	82	82
H4	215	215
H5	56	56
H6	66	66
H7	103	103
H8	49	49
H9	41	41
H10	67	67
H11	52	52
H12	80	80
H13	114	114

While Forest Plan standards and guidelines do not directly prevent the application of herbicides on areas that exceed 40 acres, as standard practice, this is generally not done. Public concern regarding the application of herbicides over large land areas will be mitigated by staggering the timing of herbicide application in the 13 blocks in Alternative 1 3, and 4 over several years. The amount of herbicide application within one operating season will be limited to a maximum of 40 contiguous acres, except where individual stand size exceeds 40 acres. The locations of East Side stands included in these blocks can be found on the East Side Outcomes Table (Table 24 of this Report). The Herb Block column on Table 24 references the Herbicide Block ID found in Table 20.

East Side Present Condition Data

The condition of vegetation and site characteristics found within stands where treatments are proposed in the East Side project will be used to describe the current situation. Three general categories of information are presented – overstory characteristics, understory/midstory characteristics, and site characteristics. The information presented in Table 22 (p. B-27) is used to quantify the condition of vegetation within treatment stands. It is also used as the basis for the selection of treatments that respond to the management objectives described in the different alternatives. And finally, it will be useful as a basis for estimating the outcomes that result from the implementation of each alternative.

Each of the values presented in this table are evaluated at the stand level. They represent site-specific data that was gathered and validated for use in the East Side project. There are two possible sources of data for this table:

Current Stand Exam – this includes stands where recent stand examination data were used to calculate or assign values. Stand data were evaluated using SILVAH (Marquis et al, 1992). Minor adjustment to some values may have been made by prescribers based upon further evaluation of site conditions, using best professional judgment.

Prescriber Estimates – this includes stands where recent stand examination data were not available. Present condition was defined by assessments made by stand prescribers during on-site visits using best professional judgment. Updates to these values may have been made based upon additional field visits or stand delineation adjustment.

The present condition data set is the basis for many of the tables included in Chapter 3 of the FEIS. More detail on outputs is available in the project file.

Present Condition Table Definitions

Stand Identification – Five data fields are used to identify the stand.

MAP ID –Page 2 of the Map Section provides an index to the section map for a particular stand location. Refer to the section map for greater detail for individual stands.

CMP – Compartment – Land areas on the ANF are subdivided into units called compartments (normally 500 to 1,000 acres in size). Compartment boundaries usually follow roads, streams, ridgelines or some other identifiable boundary.

ST – Stand – Land areas within compartments are further subdivided into stands. Stand boundaries are defined as areas with similar species distribution, stocking, and age. Previous and on-going management decisions, and site capability/management limitations also determine stand boundaries.

AC – Acres – Stand acreage calculated using Geographic Information System polygons.

OBJ – Objective – Identifies the primary objective considered when selecting stand treatments.

SALV – For thinnings, used where more than 50% of the volume is dead or dying. For regeneration harvests, used where healthy relative density is $\leq$ 40%.

GREEN – For thinnings, used where more than 50% of the volume is from healthy trees. For regeneration harvests, used where healthy relative density is > 40%.

WL – Stands being treated to achieve wildlife management objectives.

Overstory Condition – Three data fields are used to describe the current overstory condition found within each stand.

Forest Type – Current forest type for a stand. Reflects basal area of healthy trees found within the stand. Basal area of dead or dying trees is not included (see Table 21). (USDA-FS 1997b)

Table 21. Forest Type Definitions

Code	Type Name	Species Composition
2	Red Pine	50% or more of the basal area is composed of red pine
15	Tamarack	50% or more of the basal area is composed of larch
16	White spruce/Norway Spruce	50% or more of the basal area is composed of the combination of white spruce and Norway spruce
81	Northern hardwoods	50% or more of the basal area is composed of the combination of sugar maple, beech, yellow birch or hemlock
83	Allegheny hardwoods	50% or more of the basal area is composed of the combination of black cherry, yellow poplar or white ash. Black cherry is by far the most prominent species of the three.
84	Red maple	50% or more of the basal area is composed of red maple
85	Sugar maple	50% or more of the basal area is composed of sugar maple
86	American beech	50% or more of the basal area is composed of American beech
89	Upland hardwood	50% or more of the basal area is composed of red maple, black cherry, yellow poplar, white ash, basswood, or cucumber
91	Aspen	50% or more of the basal area is composed of aspen

Year of Origin – Reflects the calendar year that the stand originated. Year of origin may be determined by counting annual rings or by using stand age calculated by SILVAH. Where new stands have been established through natural regeneration, the year of origin would be the year that site preparation was completed or the year that the regeneration harvest took place.

Rel Den - Relative density – A measure used to describe the degree of crowing found within a stand based on the growing space requirements of individual tree species. The value reflects the relative stand density (a measure of stocking calculated by SILVAH) for healthy trees within each stand. Assessment of live tree health was based on percent of healthy live crown observed for each tree. It does not include trees where less than 50% of normal crown conditions exist, or trees where 51-80% of normal crown conditions exist but are expected to continue to decline. Effects of additional decline are anticipated to occur due to expanding beech bark disease complex, continued decline of sugar maple and white ash on sites that are nutrient deficient for the species where significant stress has occurred (defoliation and drought), and declines in red maple and black cherry (defoliation and drought related). Healthy relative stand density is used as the basis for determining whether or not a salvage regeneration prescription is warranted.

Midstory/Understory Condition – Seven data fields are used to describe the condition of vegetation found within the midstory or understory. These fields describe vegetation found between the forest floor and 30 feet in height.

Beech/Striped Maple Class – The percent of plots stocked with 8 or more beech or striped maple stems (Marquis, 1992). Five categories are used:

Beech/Striped Maple Class	Range of percent of plots stocked
0	0
1	1- 29% of plots stocked with beech/st maple
2	30-49% of plots stocked with beech/st maple
3	50-79% of plots stocked with beech/st maple
4	80- 100% of plots stocked with beech/st maple

Fern/Grass Class – The percent of plots stocked with 30% or more fern and or grass cover (Marquis, 1992). Five categories are used:

Fern/Grass Class	Range of percent of plots stocked
0	0
1	1- 29% of plots stocked with at least 30% fern &/or grass
2	30-49% of plots stocked with at least 30% fern &/or grass
3	50-79% of plots stocked with at least 30% fern &/or grass
4	80- 100% of plots stocked with at least 30% fern &/or grass

Total Interference Class – The percent of plots stocked with 30% or more interference (Marquis, 1992). Five categories are used:

Total Interference Class	Range of percent of plots stocked
0	0
1	1- 29% of plots stocked with at least 30% interference
2	30-49% of plots stocked with at least 30% interference
3	50-79% of plots stocked with at least 30% interference
4	80- 100% of plots stocked with at least 30% interference

Regen Class – The percent of plots stocked with at least the minimum numbers of seedlings required for Allegheny hardwood regeneration (25 seedlings per plot) or Northern hardwood regeneration (100 seedlings per plot) (Marquis, 1992). Five categories are used:

Regen Class	Range of percent of plots stocked
1	0- 29% of plots stocked with minimum seedlings required
2	30-49% of plots stocked with minimum seedlings required
3	50-69% of plots stocked with minimum seedlings required
4	70- 100% of plots stocked with minimum seedlings required
9	Less than 70% stocking; precise value not known

Birch class – The percent of plots stocked with a minimum of 2 birch seedlings per plot.

Birch Class	Range of percent of plots stocked
0	No birch seedlings found
1	1- 29% of plots stocked with minimum seedlings required
2	30-49% of plots stocked with minimum seedlings required
3	50-79% of plots stocked with minimum seedlings required
4	80- 100% of plots stocked with minimum seedlings required

Midstory – Evaluates the presence of woody vegetation (vegetation 10 – 30 feet tall)

Midstory Class	
Y	At least 30% of plots have midstory present
N	Less than 30% of plots have midstory present

UEAM Class – Evaluates the regeneration potential for uneven-aged management for the stand

UEAM Class	Description
S	≥ 35 BA of shade tolerant species
R	Beech regen adequate to qualify as advanced regen
B	Both shade tolerant BA and beech regen present
N	Neither condition found

Site Characteristics – Five categories are used to identify physical site characteristics associated with each stand

SM Site – Is the stand found on one of the topographic positions favorable to Sugar maple development?

SM Site?	
Y	Stand is in favorable SM site topographic location
N	Stand is not in favorable SM site topographic location

Group 3 Soils – The number of acres within a stand where group 3 soils are found.

Riparian Zone – The number of stand acres located within a riparian zone. Six different riparian landtypes are found in Eastside stands (FP3, UB1sc, UB2c, UB2sc, UB3sw, UB3w)

Visual Zone – The number of stand acres that are considered to be in a visually sensitive zone. This includes acres that are adjacent to Sensitivity Level 1 or 2 travel routes.

Total Sensitive Acres – the total number of acres within a stand that fall into any of the previous three categories. Acres from the three previous columns are not necessarily additive.

Table 22. East Side Present Condition

Stand Identification					Overstory Condition			Understory Condition								Site Characteristics			
MAP ID	CMP	ST	AC	OBJ	Forest Type	Year of Orig	Rel Den	Beech /Stm Class	Fern/ Grass Class	Total Interfer Class	Regen Class	Birch Class	Midstory?	UEAM Class	SM Site?	Group 3 Soils	Riparian Zone	Visual Zone	Total Sens. Ac
H-11	309		3	12.82	SALV	83	1927	34.154	3	3	3	4	0	Y	N	N	3.3332	0	0	3.3332
H-11	309		10	6.79	SALV	83	1890	36.867	4	2	4	4	0	Y	R	N	6.7221	0	0	6.7221
H-11	309		11	17.77	SALV	83	1890	33.81	3	2	3	4	0	Y	N	N	8.3519	0	0	8.3519
H-11	310		10	8.04	SALV	83	1880	33.75	1	1	1	4	0	N	N	N	0	0	0	0
M-2	439		13	36.95	SALV	84	1900	34	0	4	4	4	0	N	N	N	0	0	0	0
M-2	439		41	27.29	SALV	84	1880	37.973	0	4	4	9	0	N	N	N	0	4.0645	0	4.0645
N-3	440		19	20.4	SALV	81	1900	36.436	4	4	4	9	0	Y	B	N	0	0	0	0
M-3	440		40	20.72	SALV	83	1900	39.481	4	4	4	9	0	Y	N	N	0	0	0	0
L-3	445		5	16.17	GREEN	83	1901	101	2	4	4	9	0	Y	B	Y	0	2.8294	0	2.8294
L-3	445		9	55.33	SALV	81	1882	31.397	2	4	4	9	0	Y	R	N	0	3.5442	6.444	9.9882
L-3	445		10	9.62	GREEN	89	1894	95	3	3	4	9	0	Y	S	Y	0	0	0	0
L-3	445		14	16.11	GREEN	83	1920	86	2	4	4	9	0	Y	N	Y	0	0	9.702	9.702
L-3	445		16	40.42	SALV	81	1900	31	2	4	4	9	0	Y	R	N	0	0	0	0
N-7	484		5	43.34	SALV	81	1925	44	1	3	3	9	0	N	N	N	0	0	0	0
N-7	484		8	31.7	GREEN	81	1935	86	0	4	4	9	0	N	S	N	0	0	0	0
N-7	484		29	24.61	GREEN	83	1905	76	0	4	4	9	0	N	S	N	0	0	0	0
O-7	484		30	27.07	GREEN	89	1915	80	1	3	3	4	0	N	N	N	0	0	1.246	1.246
O-7	484		31	25.29	GREEN	89	1920	80	1	2	3	9	0	N	S	N	0	0	0	0
O-6	484		32	59.54	SALV	81	1902	70	1	4	4	9	0	N	N	N	0	0	0	0
O-7	484		33	12.46	SALV	81	1905	27	1	3	4	9	0	N	B	N	0	0	0	0
O-7	484		43	23.16	GREEN	83	1930	88	1	4	4	9	0	N	N	N	0	0	0	0
O-7	484		44	21.53	GREEN	89	1915	75	0	3	4	9	0	N	S	N	0	0	0	0
O-7	484		45	24.77	SALV	81	1925	62	3	3	4	9	0	Y	R	N	0	0	5.954	5.954
O-6	484		46	32.72	SALV	81	1925	75	1	4	4	9	0	N	S	N	0	0	0	0
N-6	484		48	22.45	SALV	89	1940	61	1	4	4	9	0	N	N	N	0	0	0	0

N-6	484	49	35.26	SALV	89	1925	73	0	4	4	9	0	N	N	N	0	0	0	0
N-7	484	52	20.36	SALV	83	1910	59	0	4	4	9	0	N	N	N	0	0	0	0
O-6	485	1	28.14	SALV	89	1910	39.403	1	3	3	9	0	N	N	N	0	0	0	0
O-7	485	25	22.17	SALV	81	1929	36.442	2	3	4	9	0	Y	N	N	0	0	0	0
O-7	485	28	18.22	SALV	84	1901	33.061	1	4	4	9	0	N	N	N	0	0	0	0
O-6	485	43	8.46	SALV	89	1910	18	0	4	4	9	0	N	N	N	0	0	0	0
I-5	492	19	19.87	SALV	81	1918	46.82	0	4	4	9	0	N	N	N	0	0	0	0
I-5	492	20	44.91	SALV	83	1902	42.3	1	4	4	9	0	N	N	N	0	0	0	0
I-6	493	9	18.84	SALV	83	1935	6.8571	1	4	4	9	0	N	N	N	0	0	0	0
I-6	493	10	51.17	SALV	83	1910	32	1	4	4	9	0	N	N	N	0	0	0	0
C-16	639	2	12.57	SALV	84	1903	63	0	4	4	0	0	N	N	N	0	0	0	0
C-16	639	5	14.02	SALV	84	1910	35	3	2	3	9	0	Y	N	N	0	0	0.963	0.963
C-16	639	7	26.33	SALV	81	1916	60	0	2	2	9	0	N	N	N	0	0	0	0
D-16	639	10	1	SALV	81	1914	77	1	2	2	9	0	N	S	N	0	0	0	0
C-16	639	17	21.12	SALV	89	1893	51	3	2	4	9	0	Y	R	N	0	0	0	0
C-16	639	64	9.63	SALV	89	1914	58	2	2	3	9	0	Y	R	N	0	0	0	0
C-16	639	67	4.3	SALV	89	1910	68	4	1	4	9	0	Y	B	N	0	0	0	0
D-16	641	26	17.78	SALV	84	1933	40	4	2	4	9	0	Y	R	N	0	1.1296	0	1.1296
D-16	641	31	15.92	SALV	89	1933	40	3	1	4	9	0	Y	N	N	0	0	5.118	5.118
D-16	641	42	40.94	GREEN	81	1928	36.438	4	1	4	9	0	Y	R	N	0	0	0	0
D-16	641	44	14.27	SALV	89	1930	63	4	3	4	4	0	Y	B	N	0	0	0	0
D-15	641	82	24.7	SALV	84	1928	40	1	4	4	9	0	N	N	N	0	0	0	0
D-16	641	86	14.12	SALV	84	1923	37.345	3	4	4	9	0	Y	R	N	0	0	1.592	1.592
C-16	641	166	8.53	SALV	89	1930	40	1	1	1	4	0	N	R	N	0	0	4.094	4.094
D-15	642	1	26.42	SALV	89	1907	67	3	4	4	9	0	Y	B	N	0	0	0	0
D-15	642	4	13.89	SALV	81	1911	84	4	4	4	9	0	Y	B	N	0	0	3.388	3.388
D-16	642	6	8.66	SALV	84	1907	58	4	4	4	9	0	Y	R	N	0	0	0	0
C-16	642	13	1.17	SALV	84	1910	74	3	4	4	9	0	Y	N	N	0	0	0	0
D-16	642	16	43	SALV	84	1903	63	2	4	4	9	0	Y	R	N	0	0	13.8	13.8

D-16	642	17	7.67	SALV	84	1910	65	3	4	4	9	0	Y	N	N	0	0	0	0
C-16	642	18	9.26	SALV	89	1910	68	4	3	4	9	0	Y	B	N	0	0	0	0
D-16	642	21	13	SALV	89	1915	69	1	2	2	9	0	N	S	N	0	0	6.5	6.5
D-16	642	23	3.28	SALV	84	1935	61	3	4	4	9	0	Y	N	N	0	1.8494	2.642	4.4914
D-16	642	24	46	SALV	81	1912	74	4	4	4	9	0	Y	B	N	0	1.3039	0	1.3039
D-16	642	25	28	SALV	89	1917	76	4	4	4	9	0	Y	R	N	0	0	0	0
C-16	642	27	3.7	SALV	89	1917	35	4	4	4	9	0	Y	R	N	0	0	0	0
D-15	642	29	16.94	SALV	81	1911	35.833	4	4	4	9	0	Y	B	N	0	0	0	0
C-16	642	30	2.01	GREEN	84	1930	36	1	3	3	9	0	N	N	N	0	0.9723	1.389	2.3613
D-14	651	19	19.45	SALV	89	1930	39.19	1	4	4	9	0	N	N	N	0	0	0	0
E-14	651	25	6.52	SALV	89	1930	46.283	1	4	4	9	0	N	S	N	0	0	0	0
E-14	651	78	5.65	SALV	83	1935	80.98	1	0	1	9	0	N	N	N	0	0	0	0
F-14	675	14	10.71	SALV	83	1925	31	0	4	4	9	0	N	N	N	0	0	0	0
F-14	675	16	29.01	SALV	84	1920	40	0	4	4	9	0	N	N	N	0	0	0	0
F-14	675	20	6.42	SALV	76	1915	56	0	4	4	9	0	N	N	N	0	0	0	0
F-13	675	21	9.14	SALV	89	1925	72	3	4	4	9	0	Y	N	N	0	0	0	0
F-13	675	27	10.32	SALV	89	1930	78	2	4	4	9	0	Y	N	N	0	0	0	0
E-14	675	41	4.26	SALV	81	1920	49	3	4	4	9	0	Y	S	N	0	0.9762	0	0.9762
E-14	675	42	13.34	SALV	84	1920	75	2	4	4	9	0	Y	N	N	12.34	0	0	12.34
E-14	675	43	15.94	SALV	89	1910	87	1	4	4	9	0	N	S	N	0	0	0	0
E-14	675	44	17.45	SALV	89	1920	58.109	2	4	4	9	0	Y	N	N	0	0	0	0
E-14	675	45	22.21	SALV	89	1935	69	1	4	4	9	0	N	N	N	0	0	0.775	0.775
E-14	675	50	22.96	SALV	89	1930	65	2	4	4	9	0	Y	N	N	0	0	0	0
F-14	675	51	15.17	SALV	84	1925	85	2	4	4	9	0	Y	N	N	0	0	1.734	1.734
F-13	675	53	10.6	SALV	86	1925	93.648	2	4	4	9	0	Y	S	N	0	0	0	0
F-14	675	58	18.08	SALV	89	1920	85	1	4	4	9	0	N	R	N	0	0	0	0
E-14	675	61	16.27	SALV	83	1920	89	3	3	4	9	0	Y	N	N	0	0	0	0
E-14	675	64	30.85	SALV	83	1915	62	3	4	4	9	0	Y	N	N	0	0	0	0
E-14	675	66	3.45	SALV	83	1905	73	1	4	4	9	0	N	N	N	0	0	0	0

E-13	675	67	33.9	SALV	83	1897	31.909	2	4	4	9	3	Y	N	N	0	0	0	0
F-13	675	72	17.58	SALV	83	1935	67	3	4	4	9	0	Y	N	N	0	0	0.642	0.642
F-14	675	78	18.54	SALV	84	1925	84	3	4	4	9	0	Y	N	N	0	0	0	0
E-14	675	79	9.97	SALV	84	1930	95	2	4	4	9	0	Y	N	N	0	0	0	0
E-14	675	87	6.12	SALV	83	1905	80	2	4	4	9	0	Y	S	Y	0	0	0	0
E-13	675	92	3.36	SALV	86	1980	39	0	4	4	9	0	N	S	Y	0	0	0	0
F-14	675	104	5.78	SALV	89	1885	87	2	4	4	9	0	Y	N	N	0	0	0	0
F-14	675	107	17.34	SALV	83	1920	62	2	4	4	9	0	Y	N	N	0	0	0	0
F-13	675	110	7.8	SALV	84	1945	51	2	4	4	9	0	Y	N	N	0	0	0	0
F-14	675	112	5.05	SALV	84	1911	37.208	1	4	4	9	0	N	N	N	0	0	0	0
F-15	684	1	28.39	GREEN	83	1921	85	1	3	3	4	0	N	N	N	0	0	0	0
G-15	684	11	30.13	GREEN	2	1936	95	1	1	1	9	1	N	N	N	0	0	0	0
G-15	684	14	25.88	GREEN	2	1939	99	0	1	1	9	0	N	N	N	0	0	0	0
G-15	684	18	4.65	GREEN	89	1915	75	1	2	2	4	0	N	N	N	0	0	0	0
G-15	684	28	4.4	GREEN	89	1927	65	1	2	2	1	0	N	N	N	0	0	0	0
F-15	684	29	5.06	GREEN	89	1916	85	1	3	3	9	0	N	N	N	0	0	0	0
F-15	684	30	7.24	GREEN	83	1921	92	1	1	1	9	0	N	N	N	0	0	0	0
F-15	684	31	10.06	GREEN	83	1925	79	1	3	3	1	0	N	N	N	0	0	0	0
F-15	684	32	2.54	GREEN	89	1930	80	1	3	3	0	0	N	N	N	0	0	0	0
G-15	684	35	6.66	GREEN	89	1916	64	1	3	3	1	0	N	N	N	0	0	0	0
F-15	684	56	6.04	GREEN	83	1916	80	1	3	3	9	0	N	S	N	0	0	0	0
G-15	684	57	5.57	GREEN	89	1927	74	1	3	3	1	0	N	N	N	0	0	0	0
H-13	700	2	22.89	GREEN	83	1914	72	1	2	2	2	1	N	N	N	0	0	0	0
H-13	700	8	39.79	SALV	83	1916	81	3	3	3	1	1	Y	B	N	0	0	0	0
H-13	700	9	5	SALV	83	1916	77	1	1	1	3	0	N	N	N	0	0	0	0
H-14	700	13	12.68	SALV	89	1912	34.207	3	3	3	1	2	Y	R	N	0	0	0	0
H-13	700	14	12.09	GREEN	83	1916	66	3	4	4	2	1	Y	N	N	0	0	0	0
H-14	700	16	16.01	SALV	83	1912	40	1	1	1	4	0	N	N	N	0	0	1.617	1.617
H-14	700	18	14.03	SALV	89	1910	72	1	1	1	9	1	N	N	N	0	2.99	2.3	5.29

H-14	700	21	16.25	SALV	83	1920	59.231	1	1	1	9	0	N	N	N	0	0	0	0
H-14	700	22	15.22	GREEN	83	1930	84	1	4	4	9	1	N	N	N	0	0	0	0
H-14	700	25	20.68	SALV	89	1910	35.368	3	1	3	1	4	Y	R	N	0	0	0	0
H-14	700	32	12.39	GREEN	83	1924	79	1	4	4	0	0	N	N	N	0	0	0	0
H-14	700	34	17.43	SALV	83	1920	68.478	1	3	3	9	1	N	B	N	0	0	0	0
H-14	700	35	28.59	SALV	89	1924	42.839	2	4	4	9	0	Y	S	N	0	0	0	0
H-14	700	37	18.72	SALV	83	1924	58.333	1	1	1	2	0	N	N	N	0	1.503	0	1.503
H-14	700	38	11.27	SALV	83	1930	36.837	2	4	4	9	2	Y	N	N	0	0	0	0
H-14	700	40	22.99	GREEN	83	1981	75	1	1	1	4	2	N	N	N	0	0	0	0
H-14	700	44	11	GREEN	89	1924	56.136	1	3	4	1	1	N	N	N	0	0	2.432	2.432
G-14	700	45	18.36	GREEN	83	1924	78	1	4	4	1	0	N	N	N	0	0	0	0
H-14	700	51	30.13	GREEN	84	1907	66.667	1	4	4	3	0	N	R	N	0	0	0	0
G-14	700	56	23.96	GREEN	2	1944	127	0	1	1	9	0	N	N	N	0	0	0	0
H-14	700	57	29.55	SALV	89	1934	19.169	3	2	3	3	2	Y	R	N	0	0	0	0
H-14	700	61	24.82	SALV	83	1890	18.652	1	4	4	9	0	N	N	N	0	0	0	0
H-14	700	63	11.95	SALV	83	1920	68.571	2	3	4	1	1	Y	R	N	0	0	0	0
H-14	700	64	14.47	SALV	89	1924	79.333	2	3	4	9	1	Y	B	N	0	0	0	0
G-15	700	67	57	GREEN	2	1944	120	0	1	1	9	0	N	N	N	0	0	0	0
H-14	700	70	12.53	SALV	83	1914	72.692	1	4	4	1	1	N	N	N	0	0	0	0
G-14	700	71	6.45	SALV	89	1934	39.48	1	3	3	1	2	N	N	N	0	0	0	0
G-15	700	77	16.17	GREEN	2	1924	83	0	2	1	9	0	N	N	N	0	1.71	5.7	7.41
G-14	700	83	15.57	SALV	83	1924	77.485	1	3	3	9	0	N	N	N	0	0	0	0
G-14	700	85	15.22	SALV	83	1920	69	1	4	4	9	0	N	N	N	0	0	0	0
G-15	700	91	23	GREEN	2	1934	97	0	1	1	9	0	N	N	N	0	0	0	0
H-14	700	96	2.9	SALV	83	1920	63.052	1	3	3	9	0	N	N	N	0	0	0	0
H-14	700	97	13.48	SALV	83	1924	69.643	1	2	2	1	0	N	S	N	0	0	0	0
H-14	700	98	19.63	SALV	83	1924	63	1	1	1	1	1	N	B	N	0	0	6.867	6.867
H-14	700	99	22	SALV	83	1924	76	1	3	3	2	1	N	N	N	0	0	0	0
H-14	700	102	17.92	GREEN	89	1912	65	1	3	3	2	0	N	S	N	0	0	0.5	0.5

H-14	700	103	11.2	SALV	83	1940	78.75	1	0	1	9	0	N	S	N	0	0	3.979	3.979
H-14	700	112	12.74	SALV	89	1924	64.167	1	2	2	1	1	N	N	N	0	0	3.717	3.717
H-14	700	113	14.66	GREEN	89	1924	48	1	4	4	9	0	N	S	N	0	0	0	0
H-14	700	114	16.99	SALV	83	1921	56	1	2	2	9	0	N	N	N	0	0	0	0
H-14	700	115	25.05	GREEN	83	1920	85	0	0	0	9	0	N	S	N	0	0	0	0
H-14	700	124	21.54	SALV	83	1924	65.444	0	1	1	9	0	N	N	N	0	0	0	0
H-14	700	125	15.33	SALV	89	1920	71.46	1	2	2	9	0	N	N	N	0	1.5687	0	1.5687
H-14	700	129	15.74	GREEN	83	1912	75	1	1	1	4	1	N	N	N	0	0	0	0
G-15	700	130	18.07	SALV	89	1934	27.879	1	4	4	1	1	N	N	N	0	0	0	0
G-14	700	131	11.55	SALV	89	1924	27.182	3	4	4	4	2	Y	R	N	0	0	0	0
H-14	700	132	6.09	GREEN	83	1923	60.185	2	1	2	3	0	Y	R	N	0	0	0	0
H-14	700	134	4.18	SALV	83	1924	69.231	1	1	1	9	0	N	N	N	0	3.594	2.396	5.99
H-14	700	135	8.49	GREEN	83	1912	80	1	0	1	9	0	N	S	N	0	0	0	0
H-14	700	138	6.43	GREEN	83	1908	72	1	2	2	4	1	N	R	N	0	0	0	0
H-13	700	142	12.16	GREEN	16	1941	88	0	0	0	9	0	N	N	N	0	0	0	0
G-14	701	2	18.96	SALV	83	1925	72	1	2	2	2	1	N	N	N	0	0	7.38	7.38
G-14	701	12	4.64	SALV	89	1934	80	1	4	4	1	0	N	S	N	0	0.6664	2.856	3.5224
G-14	701	13	34.02	GREEN	89	1929	51.818	0	3	3	2	2	N	N	N	0	0	2.192	2.192
G-14	701	16	8.53	GREEN	83	1914	75	0	4	4	4	0	N	N	N	0	0	0	0
G-14	701	17	9.53	GREEN	2	1939	112	0	1	1	9	0	N	N	N	0	0	3.09	3.09
G-14	701	22	71	GREEN	2	1939	103	0	1	1	9	0	N	N	N	0	0	4.08	4.08
G-14	701	30	5.48	GREEN	84	1932	68	0	3	3	3	0	N	N	N	0	0	2.325	2.325
G-14	701	31	14.51	SALV	89	1925	60.455	1	3	3	1	1	N	N	N	0	0	4.353	4.353
G-14	701	35	23.25	GREEN	89	1924	49.091	1	3	3	1	1	N	N	N	0	0	3.792	3.792
G-14	701	37	14.76	SALV	89	1936	44.094	1	2	2	1	0	N	S	N	0	3.55	0	3.55
G-14	701	47	10.2	SALV	89	1920	88.139	1	0	1	1	0	N	S	N	0	0	1.906	1.906
H-14	701	54	9.52	GREEN	89	1920	85	1	1	1	9	0	N	N	N	0	0	0	0
H-14	701	55	17	GREEN	89	1924	48	2	3	3	2	1	Y	S	N	0	0	6.804	6.804
G-14	701	59	15.45	SALV	89	1926	34.112	1	3	3	3	1	N	N	N	0	0	0.464	0.464

I-14	712	3	16.49	GREEN	84	1910	80	1	1	2	2	0	N	N	N	0	0	0	0
I-14	712	8	17.6	GREEN	89	1904	83	1	3	3	1	1	N	S	N	0	0	0	0
I-14	712	11	9.99	GREEN	89	1890	87	1	1	2	1	1	N	S	N	0	0	0	0
I-14	712	12	13.37	GREEN	89	1890	69	1	1	1	4	1	N	N	N	0	0	6.372	6.372
I-14	712	16	16.55	GREEN	83	1925	96	0	1	1	1	0	N	N	N	0	0	0	0
I-14	712	17	15.39	GREEN	84	1908	74	1	3	3	1	1	N	N	N	0	0	1.539	1.539
I-14	712	19	24.46	GREEN	83	1910	83	1	1	1	9	0	N	S	N	0	0	0	0
I-14	712	20	10.58	GREEN	89	1890	75	1	4	4	1	1	N	N	N	0	0	0	0
I-14	712	23	10.97	GREEN	89	1904	83	1	3	3	9	0	N	N	N	0	0	0	0
I-14	712	25	10.93	GREEN	84	1910	80	1	1	1	4	0	N	R	N	0	0	0	0
I-14	712	28	31.86	SALV	89	1917	42.857	1	4	4	9	0	N	B	N	0	0	0	0
J-7	801	6	29.36	GREEN	89	1916	79.768	1	3	3	0	0	N	N	N	0	0	0	0
J-7	801	15	15.86	GREEN	89	1908	88.015	2	1	3	3	0	Y	S	N	0	0	0.394	0.394
J-7	801	16	12.83	GREEN	2	1926	77	0	3	3	0	0	N	N	N	0	0	0	0
J-7	801	17	22.63	GREEN	2	1942	90	1	2	2	0	0	N	N	N	0	0	0	0
J-7	801	30	39.38	GREEN	84	1921	77.155	1	3	3	0	0	N	N	N	0	0	0	0
J-7	801	31	16.5	GREEN	84	1913	56.055	1	3	3	0	0	N	N	N	0	0	0	0
J-7	801	32	3.94	GREEN	84	1907	82.776	0	4	4	0	0	N	N	N	0	0	7.68	7.68
J-7	801	33	12.8	GREEN	89	1913	59.492	1	2	3	0	0	N	N	N	0	0	0	0
K-7	801	34	2.38	SALV	81	1927	27.358	1	3	3	0	0	N	S	Y	0	0	3.3	3.3
J-7	801	38	13.97	GREEN	84	1923	98	1	1	1	0	0	N	S	N	0	0	0	0
J-7	801	39	16.23	GREEN	84	1922	102	0	0	0	0	0	N	S	N	0	0	11.744	11.744
J-7	801	40	1	WL	81	1926	63	1	2	3	9	0	N	N	N	0	0	0	0
J-7	801	41	19.08	GREEN	2	1938	107	1	1	1	0	0	N	N	N	0	2.9509	0	2.9509
L-9	816	1	16.47	SALV	89	1908	73	1	3	4	3	0	N	N	N	1.3585	0	0	1.3585
L-9	816	2	24.57	GREEN	84	1908	78.448	1	3	3	1	0	N	N	N	0	0	0	0
L-9	816	3	21.46	SALV	89	1908	73	2	3	4	0	0	Y	N	N	5.684	0	0	5.684
L-9	816	5	21.2	SALV	83	1916	37.168	1	4	4	1	1	N	N	N	6.7296	0	0	6.7296
L-9	816	6	8.8	SALV	89	1913	72.821	0	4	4	2	0	N	S	N	0	0.4152	0	0.4152

L-8	816	12	62.03	SALV	81	1881	25.316	2	3	4	1	0	Y	R	N	5.6962	0	0	5.6962
L-9	816	14	7.22	GREEN	83	1911	64.623	1	3	3	4	0	N	S	N	0	0	0	0
K-9	816	18	6.38	GREEN	89	1911	100.72	1	3	3	3	0	N	B	N	4.0526	0	0	4.0526
L-9	816	22	14.2	GREEN	89	1914	82.548	2	4	4	2	0	Y	B	N	2.727	0	0	2.727
K-9	816	24	19.24	GREEN	83	1904	83	2	3	3	2	0	Y	N	N	3.612	0	0	3.612
L-9	816	26	11.31	GREEN	89	1904	88.339	0	3	3	2	0	N	S	N	1.92	0	0	1.92
L-9	816	29	7.19	GREEN	84	1907	86.769	0	4	4	0	0	N	R	N	0	0	0	0
L-8	816	34	3.74	SALV	83	1906	38.989	3	4	4	1	0	Y	N	N	0	0	0	0
L-9	816	44	5.42	GREEN	83	1913	77.513	2	2	3	3	0	Y	N	N	6.8338	0	0	6.8338
L-9	816	47	5.32	GREEN	83	1913	44	0	4	4	3	1	N	S	N	0	0	0	0
L-9	816	54	7.27	GREEN	84	1913	74.961	2	3	3	1	0	Y	R	N	4.118	0	0	4.118
L-9	816	59	14.99	SALV	83	1917	34.318	2	3	4	1	0	Y	R	N	0	0	0	0
L-9	816	61	2.09	SALV	89	1907	33.786	1	4	4	0	0	N	N	N	0	0	0	0
L-9	816	63	5.88	GREEN	89	1907	77.846	2	2	3	0	0	Y	B	0	0	0	4.914	4.914
K-9	816	65	5.8	SALV	83	1911	35.893	3	3	4	1	1	Y	R	N	0	0	4.292	4.292
K-9	816	69	14.02	SALV	89	1898	38.447	1	4	4	1	0	N	N	N	0	0	0	0
L-9	816	70	3.46	GREEN	89	1916	81.276	3	3	3	0	0	Y	S	N	0	0	0	0
L-9	816	71	5.23	GREEN	89	1916	60.48	1	1	3	0	0	N	B	N	0	0	3.294	3.294
L-9	816	72	5.7	GREEN	89	1916	74.107	2	1	3	1	0	Y	R	N	0	0	0	0
L-9	816	74	3	WL	89	1925	64	1	2	3	1	0	N	N	0	6.38	0	0	6.38
L-8	816	77	8.81	GREEN	84	1906	53.25	0	4	4	0	0	N	N	N	0	0	18.609	18.609
L-8	816	82	5.71	GREEN	83	1914	78.688	0	3	3	0	0	N	N	N	15.969	0	0	15.969
L-9	816	86	5.16	SALV	76	1937	42.409	1	4	4	1	0	N	N	N	0	5.7681	0	5.7681
L-9	816	87	5.05	GREEN	89	1907	93.625	0	4	4	3	0	N	S	Y	0	0	0	0
K-8	817	4	9.94	GREEN	83	1936	91	1	4	4	9	0	N	N	N	5.5224	0	0	5.5224
K-8	817	6	43.08	GREEN	89	1913	84	3	3	4	9	0	Y	R	N	0	0	0	0
K-8	817	9	27.88	GREEN	15	1954	86	1	2	4	9	0	N	N	N	0	0	0	0
K-8	817	12	27.31	GREEN	83	1910	97	3	2	4	9	0	Y	R	N	0	0	0	0
K-8	817	13	4	WL	84	1911	80	2	2	4	9	0	Y	N	N	0	0	0	0

K-8	817	15	20.31	SALV	84	1924	39.065	1	3	4	9	0	N	N	N	0	0	0	0
K-8	817	16	10.11	SALV	89	1920	80	1	4	4	9	0	N	N	N	0	0	0	0
K-8	817	18	15.66	SALV	83	1912	85	1	3	3	9	0	N	N	N	11.601	0	0	11.601
K-8	817	21	35.49	GREEN	83	1916	45.5	3	3	4	9	0	Y	R	N	0	0	0	0
K-8	817	25	27.25	SALV	83	1919	67	1	4	4	9	0	N	N	N	11.852	0	0	11.852
K-9	817	26	18.87	SALV	83	1922	41.221	0	4	4	9	0	N	N	N	29.322	0	0	29.322
K-8	817	27	18.94	GREEN	83	1909	64	1	4	4	9	0	N	N	N	0	7.5468	0	7.5468
K-8	817	28	19	SALV	89	1918	70	3	3	4	9	0	Y	N	N	98.738	0	0	98.738
K-9	817	30	105	GREEN	2	1942	121	0	4	4	9	0	N	N	N	11.888	0	0	11.888
K-9	817	31	29.4	SALV	83	1915	75	1	2	4	9	0	N	N	N	0	0	0	0
K-9	817	32	7.03	SALV	83	1930	60	1	4	4	9	0	N	N	N	0	0	0	0
K-9	817	33	22.77	GREEN	83	1914	44.608	2	3	4	9	0	Y	N	N	0	0	0	0
K-9	817	39	26.84	GREEN	83	1898	67.55	2	2	4	1	0	Y	N	N	0	0	0	0
K-9	817	42	17.84	SALV	83	1917	62.662	1	2	4	1	0	N	R	N	6.93	0	0	6.93
K-8	817	43	11.45	GREEN	89	1927	99	2	3	3	9	0	Y	S	N	0	0	0	0
K-9	817	45	19.86	SALV	83	1915	52.086	2	3	4	0	0	Y	R	N	0	0	0	0
K-9	817	48	17.06	SALV	83	1925	44.554	0	4	4	9	0	N	N	N	0	0	0	0
K-8	817	49	12.24	SALV	89	1915	148.28	4	1	4	9	0	Y	B	N	0	0	0	0
K-9	817	50	14.11	SALV	89	1901	84	1	2	4	9	0	N	N	N	0	0	0	0
K-8	817	51	29.92	GREEN	2	1945	116	0	4	4	9	0	N	N	N	0	1.635	0	1.635
K-8	817	53	10.62	SALV	89	1907	92	2	2	4	9	0	Y	S	N	0	0	0	0
K-8	818	22	2.47	SALV	83	1945	69	0	3	3	9	0	N	N	N	0	0	0	0
K-8	818	35	8.54	GREEN	89	1924	66	0	3	3	9	0	N	N	N	0	2.8182	0	2.8182
K-8	819	1	5.08	SALV	89	1912	40.526	0	4	4	9	0	N	N	N	0	0	0	0
K-8	819	2	18.88	SALV	89	1910	79.809	1	2	3	9	0	N	S	N	0	0	22.85	22.85
K-8	819	3	2	WL	15	1946	58	1	4	4	9	0	N	N	N	0	3.4638	0	3.4638
K-8	819	4	30.74	GREEN	89	1909	58.019	3	1	3	9	0	Y	R	N	0	0	0	0
K-8	819	6	1.47	GREEN	2	1939	91.288	0	3	3	9	0	N	N	N	0	0	0	0
K-8	819	8	5	WL	89	1960	71	0	4	4	9	0	N	N	N	0	0	0	0

K-8	819	9	19.78	SALV	83	1924	55.418	1	4	4	9	0	N	S	N	0	1.16	0	1.16
J-8	819	10	25.16	SALV	89	1922	75.643	1	3	3	9	0	N	N	N	0	0	0	0
J-8	819	12	18.43	SALV	84	1918	84.403	1	3	3	9	0	N	S	N	0	0	0	0
J-8	819	13	25.07	SALV	83	1927	37.805	1	1	1	9	0	N	N	N	0	3.456	0	3.456
K-8	819	17	25.91	GREEN	84	1911	89.885	1	4	4	9	0	N	N	N	0	0.696	0	0.696
K-8	819	22	6.09	GREEN	89	1901	68.75	3	4	4	9	0	Y	B	N	0	0	0	0
K-9	819	23	30.35	GREEN	2	1943	133.72	0	3	3	9	0	N	N	N	0	0	1.593	1.593
J-8	819	24	10.9	SALV	83	1952	60	0	4	4	9	0	N	N	N	0	0	1.09	1.09
J-8	819	25	5.31	GREEN	2	1943	90.533	0	3	3	9	0	N	N	N	0	0	0	0
J-8	819	26	4	WL	84	1930	64	0	4	4	9	0	N	N	N	0	0	0	0
J-8	819	28	22.85	GREEN	2	1939	74.817	0	3	3	9	0	N	N	N	0	0	0	0
J-8	819	29	15.06	GREEN	89	1904	81.931	2	2	4	9	0	Y	N	N	0	4.856	0	4.856
J-8	819	30	12.39	SALV	84	1920	58.694	1	4	4	9	0	N	N	N	0	0	0	0
J-8	819	33	11.47	GREEN	83	1900	75.671	1	4	4	9	0	N	R	N	0	0	0	0
J-8	819	36	14.5	SALV	89	1924	58.711	1	2	2	9	0	N	N	N	0	0	0	0
J-8	819	37	10.48	SALV	89	1925	71.659	1	3	4	9	0	N	N	N	0	0	0	0
J-8	819	38	3.89	SALV	83	1912	56.538	0	4	4	9	0	N	N	N	4.8	0	0	4.8
J-8	819	40	12	GREEN	89	1951	69	1	4	4	9	0	N	N	N	0	0	0	0
K-8	819	41	9.6	GREEN	89	1919	56.833	1	4	4	9	0	N	N	N	0	0	0	0
K-8	819	45	5	WL	89	1914	57	0	4	4	9	0	N	N	N	0	0	0	0
J-8	819	47	13.92	SALV	89	1906	63.643	0	4	4	9	0	N	N	N	0	4.5288	0	4.5288
J-9	820	49	13.83	GREEN	2	1945	101.9	0	4	4	9	0	N	N	N	0	3.7341	4.149	7.8831
J-9	821	62	4.76	GREEN	89	1898	87	4	3	4	4	0	Y	B	Y	0	0	1.471	1.471
I-9	821	63	8.88	GREEN	89	1908	100	3	1	3	9	0	Y	B	Y	0	0	0	0
I-9	821	68	28.1	GREEN	89	1922	104	3	2	3	9	0	Y	S	Y	0	0	0	0
I-9	821	69	14.99	GREEN	81	1922	97	3	2	3	4	0	Y	B	N	0	0	0	0
I-9	821	71	11.94	GREEN	89	1929	99	3	1	3	9	0	Y	S	Y	0	0	0	0
I-9	821	85	14.71	GREEN	89	1907	97	2	3	3	4	0	Y	S	N	0	0	0	0
J-9	826	2	4.73	GREEN	89	1927	79	2	2	2	9	0	Y	S	Y	0	0	0	0

J-9	826	3	13.03	GREEN	89	1917	78.03	1	4	4	9	0	N	N	N	0	0	0	0
I-9	826	6	14.43	GREEN	89	1919	52.313	2	4	4	9	0	Y	S	N	0	0	0	0
J-9	826	8	17.6	GREEN	89	1920	83.05	1	3	4	9	0	N	N	N	0	0	0	0
J-9	826	9	4.47	SALV	89	1920	70	1	1	1	9	0	N	S	N	0	0	4.8	4.8
J-9	826	13	29.25	SALV	89	1920	56.467	1	4	4	9	0	N	N	N	0	0	0	0
J-9	826	18	15	GREEN	89	1915	68.571	1	3	3	4	0	N	N	N	0	1.1523	0	1.1523
J-9	826	19	22.07	GREEN	89	1917	94.388	2	3	3	9	0	Y	S	N	0	0	0	0
J-9	826	21	20.4	SALV	84	1935	45.901	1	3	3	9	0	N	N	N	0	0	6.735	6.735
J-9	826	28	21.55	GREEN	89	1910	80.342	1	4	4	9	0	N	N	N	0	0	0	0
J-9	826	31	23.28	GREEN	89	1930	80	0	4	4	4	0	N	N	N	0	0	0	0
J-9	826	33	13.52	GREEN	89	1920	70.704	2	4	4	9	0	Y	R	N	0	0	0	0
J-9	826	34	11.51	GREEN	84	1965	71	0	3	3	9	0	N	N	N	0	0	0	0
J-9	826	44	8.97	GREEN	83	1914	80	1	3	3	9	0	N	N	N	0	0	0	0
J-9	826	45	30.41	SALV	89	1914	34.696	1	4	4	9	0	N	N	N	0	0	0	0
J-9	826	51	19.85	GREEN	89	1920	79.423	2	4	4	9	0	Y	S	N	0	0	0	0
J-9	826	57	11.74	SALV	84	1917	67.2	2	3	3	9	0	Y	N	N	0	0	0	0
J-9	826	59	14.2	GREEN	84	1917	78	2	4	4	9	0	Y	N	N	0	0	0	0
J-9	826	60	25.91	GREEN	84	1917	56.182	1	4	4	9	0	N	N	N	0	0	0	0
J-9	826	62	24.66	GREEN	84	1920	58.711	1	4	4	9	0	N	N	N	0	0	0	0
J-9	826	63	15.87	GREEN	84	1920	68.489	1	3	4	4	0	N	N	N	0	0	0	0
J-9	826	64	13.22	GREEN	84	1935	74.66	2	3	3	9	0	Y	N	N	0	0	0	0
J-9	826	67	11.51	GREEN	89	1927	81	1	3	3	9	0	N	N	N	0	0	0	0
J-9	826	68	4.67	GREEN	84	1920	72	0	4	4	9	0	N	N	N	0	0	0	0
J-9	826	69	9.67	GREEN	83	1930	82	1	4	4	9	0	N	N	N	0	0	0	0
J-9	826	70	38.41	GREEN	84	1930	71	0	2	2	9	0	N	N	N	0	0	0	0
J-9	826	75	16	GREEN	83	1930	70.148	2	2	2	9	0	Y	N	N	0	0	0	0
J-9	826	76	22.45	SALV	83	1910	69.188	2	4	4	9	0	Y	N	N	0	0	2.04	2.04
J-9	826	84	10.29	SALV	83	1920	73.667	1	4	4	4	0	N	N	N	0	0	0	0
J-9	826	85	19.94	SALV	83	1920	60.54	1	3	3	9	0	N	S	N	0	0	4.31	4.31

J-9	826	86	7.79	SALV	83	1920	66.522	2	2	3	4	0	Y	S	N	0	0	0	0
J-9	826	88	12.8	GREEN	84	1917	55.891	1	4	4	9	0	N	N	N	0	0	0	0
J-9	826	89	13.75	SALV	89	1917	38.182	1	3	3	4	0	N	N	N	0	0	0	0
J-9	826	90	10.04	SALV	83	1910	38.182	1	4	4	9	0	N	N	N	0	0	0	0
K-9	827	2	24.24	GREEN	2	1944	120	0	1	1	9	0	N	N	N	0	1.3812	0	1.3812
K-9	827	14	19.8	SALV	83	1912	92	3	3	4	9	0	Y	B	N	0	0	0	0
K-9	827	15	17.31	GREEN	16	1943	143	0	0	0	9	0	N	N	N	0	0	0	0
K-9	827	16	22.06	SALV	83	1909	88.166	2	3	3	9	0	Y	N	N	0	1.5696	0	1.5696
K-9	827	18	48.75	GREEN	83	1909	77	1	4	4	4	0	N	N	N	0	0	0	0
K-9	827	24	20.7	GREEN	83	1926	95	1	2	3	9	0	N	N	N	0	0	0	0
K-10	827	30	19.46	GREEN	83	1914	96	1	3	4	9	0	N	N	N	0	0	0	0
J-10	827	33	9.24	GREEN	83	1922	70	2	3	3	9	0	Y	N	N	0	0	0	0
J-10	827	34	17.92	GREEN	83	1926	80	2	3	4	9	0	Y	N	N	0	0	0	0
J-10	827	40	18.65	GREEN	89	1925	68.889	1	4	4	9	0	N	S	N	0	0	0	0
J-10	827	41	16.41	SALV	83	1925	77.516	1	4	4	9	0	N	N	N	0	0	0	0
J-10	827	51	25.55	GREEN	89	1926	97	1	3	3	9	0	N	N	N	0	0	0	0
K-9	827	58	17.44	GREEN	2	1944	118	0	1	1	9	0	N	N	N	0	0	0	0
K-9	827	59	11.51	SALV	84	1940	84.434	3	3	3	9	0	Y	R	N	0	0	0	0
K-9	827	60	17.16	SALV	83	1932	49.712	1	3	3	9	0	N	N	N	0	0	1.641	1.641
K-9	827	61	19.34	SALV	89	1932	50.286	1	3	4	9	0	N	N	N	0	0	0	0
K-10	827	65	6.1	GREEN	83	1940	85	2	2	3	9	0	Y	N	N	0	0	0	0
J-9	827	66	9.11	SALV	83	1914	38	4	2	4	9	0	Y	R	N	0	0	0	0
K-9	827	67	10.77	SALV	89	1932	42	4	2	4	9	0	Y	R	N	0	0	0	0
K-10	827	68	5.82	GREEN	83	1909	90	1	2	2	9	0	N	N	N	0	0	0	0
K-9	827	69	14.05	GREEN	83	1909	68.308	3	4	4	9	0	Y	R	N	0	0	0	0
J-10	827	71	8.27	GREEN	83	1940	94	1	1	2	9	0	N	N	N	0	0	0	0
K-9	828	12	11.25	GREEN	84	1916	89	1	4	4	9	0	N	N	N	0	0	0	0
K-9	828	15	16.7	SALV	84	1925	36.868	2	4	4	9	0	Y	N	N	0	0	0	0
K-9	828	17	27.3	GREEN	16	1946	140	0	0	0	9	0	N	N	N	0	0	0	0

K-10	828	31	12.18	SALV	81	1910	27	3	3	3	9	0	Y	B	N	0	0	0	0
K-9	828	33	18.88	GREEN	83	1910	48.29	1	4	4	9	0	N	N	N	0	0	0	0
K-9	828	52	13.54	GREEN	83	1910	73.514	1	3	3	9	0	N	N	N	0	0	0	0
K-9	828	53	22.96	GREEN	84	1920	77	2	4	4	9	0	Y	B	N	0	0	0	0
K-10	829	8	18.88	GREEN	89	1908	61.75	1	2	3	9	0	N	N	N	0	0	0	0
K-10	829	9	17.92	GREEN	89	1908	81	3	2	4	9	0	Y	B	N	0	0	0	0
K-10	829	10	30.81	GREEN	89	1908	78	1	2	3	9	0	N	N	N	0	0	0	0
K-10	829	24	7.67	GREEN	89	1930	74.286	0	2	2	9	0	N	S	N	0	0	0	0
J-11	830	21	24.35	SALV	83	1918	63.226	3	3	3	0	1	Y	B	N	0	0	4.325	4.325
J-10	830	22	44.75	SALV	83	1911	58.944	1	4	4	2	1	N	S	N	0	0	0	0
K-11	830	29	14.19	SALV	83	1927	64.657	2	2	3	3	1	Y	N	N	0	0	0	0
J-11	830	43	16.44	SALV	83	1911	52.159	2	1	3	3	3	Y	N	N	0	0	4.11	4.11
J-10	830	61	12.6	SALV	83	1901	54.859	3	2	4	3	1	Y	S	N	0	0	0	0
K-11	830	62	4.11	SALV	89	1905	55.152	0	0	0	0	3	N	S	N	0	0	9.74	9.74
J-10	830	66	13.44	SALV	83	1911	35	1	4	4	1	1	N	N	N	0	0	1.419	1.419
J-11	830	70	8.65	SALV	83	1905	71.158	2	3	3	1	0	Y	B	N	0	0	0	0
J-11	831	4	17.95	SALV	89	1924	69	3	1	4	2	0	Y	B	N	0	0	0	0
J-11	831	12	33.6	SALV	89	1917	64	2	2	3	2	1	Y	B	N	0	0	0	0
J-11	831	13	15.67	SALV	89	1925	53.855	1	1	2	3	3	N	N	N	0	0	0	0
J-11	831	15	15.17	SALV	76	1924	35.455	2	2	3	1	1	Y	R	N	0	1.0296	2.86	3
J-11	831	30	3.4	SALV	89	1926	48.273	1	1	2	1	0	N	N	N	0	0	5.604	5.604
J-11	831	37	28.02	SALV	89	1917	50.36	3	1	4	1	1	Y	B	N	0	0	0	0
J-11	831	40	10.43	SALV	89	1922	63.94	3	1	3	0	1	Y	R	N	0	0	0	0
J-11	831	42	10.67	SALV	84	1925	59.313	1	1	2	0	1	N	N	N	0	1.972	0	1.972
J-11	831	43	8.81	SALV	89	1927	64.703	1	1	1	0	0	N	N	N	0	0	10.08	10.08
J-11	831	51	2.86	SALV	83	1918	49.179	2	3	4	0	0	Y	N	N	0	1.436	8.975	10.411
J-11	833	3	18.23	SALV	83	1915	86.651	1	2	2	0	0	N	S	N	0	0	0	0
J-12	833	23	10.59	SALV	89	1900	46	3	1	4	1	0	Y	B	N	0	0	0	0
J-12	833	37	8.43	SALV	83	1928	25.412	3	3	4	1	0	Y	R	N	0	0	0	0

J-11	833	43	15.54	SALV	89	1907	76.973	0	3	3	1	0	N	S	Y	0	0	0	0
J-11	833	57	13.78	SALV	83	1925	68.394	0	4	4	3	0	N	S	N	0	0	0	0
J-11	833	70	28	GREEN	83	1901	53	0	2	2	4	0	N	N	N	0	0	9.108	9.108
J-12	833	77	15.89	SALV	89	1940	35.636	2	4	4	0	0	Y	N	N	0	0	5.469	5.469
J-11	833	102	21.65	SALV	89	1921	47.888	1	3	4	2	0	N	N	N	0	0	5.512	5.512
J-12	833	116	3.39	SALV	89	1920	73.972	3	1	3	0	0	Y	S	N	0	0	1.554	1.554
J-12	833	120	11.44	SALV	89	1919	60.154	1	2	2	2	0	N	N	N	0	0	0	0
I-12	833	122	11.14	SALV	89	1921	50.009	0	0	4	2	0	N	N	N	0	0	0	0
J-11	833	132	7.46	SALV	89	1903	29.292	2	4	4	1	0	Y	N	N	0	0	0	0
K-11	834	19	50.26	SALV	89	1898	49.723	3	3	3	1	1	Y	N	N	0	0	0	0
K-11	835	28	12.04	SALV	89	1899	26.047	2	4	4	1	2	Y	B	N	0	0	1.204	1.204
L-12	841	23	16.29	SALV	81	1902	37.864	3	2	4	1	0	Y	B	N	0	0	0	0
L-12	841	25	13.19	SALV	89	1932	43.671	2	3	4	1	1	Y	S	N	0	4.4846	0	4.4846
L-12	841	33	15.4	SALV	89	1913	36.582	1	4	4	1	1	N	N	N	0	0	3.08	3.08
L-12	841	35	14.15	SALV	89	1905	42.105	1	4	4	1	1	N	S	N	3.962	0	2.83	6.792
L-12	841	46	12	SALV	83	1915	27	0	3	3	0	0	N	N	N	0	0	1.2	1.2
L-12	841	51	6.3	SALV	89	1910	20.547	1	1	2	0	0	N	N	N	0	0	0	0
L-12	841	54	3.98	SALV	89	1923	34	0	3	3	0	0	N	N	N	0	0	0	0
K-12	842	5	11.48	SALV	83	1900	40.054	0	4	4	1	0	N	S	N	0	0	0	0
K-12	842	32	16.1	SALV	89	1920	42.5	1	3	3	2	3	N	B	N	0	0	0	0
K-12	842	74	10.09	SALV	83	1920	37.756	2	4	4	1	1	Y	N	N	0	0	0	0
I-12	844	12	28.5	SALV	83	1921	65.651	1	3	4	1	1	N	N	N	0	0	0	0
I-12	844	17	7.08	SALV	84	1920	69.186	2	3	4	2	0	Y	N	N	0	0	0	0
I-12	844	29	16.26	GREEN	84	1911	46.736	1	4	4	1	2	N	R	N	0	0	0	0
I-12	844	38	11.44	SALV	83	1925	30.244	3	4	4	2	3	Y	R	N	0	0	0	0
I-12	844	40	13.94	SALV	83	1907	32.961	3	3	4	2	3	Y	R	N	0	0	0	0
I-12	844	42	20.51	SALV	83	1911	43.248	2	3	4	1	3	Y	N	N	0	0	0	0
J-12	844	64	5.41	SALV	84	1917	69.929	0	4	4	0	0	N	N	N	0	0	0	0
I-12	844	75	3.88	SALV	83	1907	45.148	3	3	4	2	3	Y	R	N	0	0	0	0

N-12	852	39	28	GREEN	83	1906	65	1	3	3	4	1	Y	N	N	0	0	0	0
N-12	853	1	28.13	SALV	81	1905	55.73	3	2	4	9	3	Y	B	N	0	0	0	0
N-13	853	2	36.57	SALV	89	1911	60.261	1	3	4	9	1	N	N	N	0	0	2.541	2.541
N-12	853	28	19.41	SALV	89	1913	51	1	4	4	9	1	N	N	N	0	0	0	0
M-13	853	34	23	SALV	89	1910	40	1	3	3	9	3	Y	N	N	0	0	0	0
N-13	853	40	7.04	SALV	89	1911	36.293	1	0	1	9	4	N	N	N	0	0	0	0
N-12	853	41	5.58	SALV	84	1913	62.138	1	4	4	9	1	N	R	N	0	0	0	0
N-12	853	43	8.38	SALV	83	1905	36.944	2	4	2	9	3	Y	R	N	0	0	0	0
N-13	853	44	16.98	SALV	89	1911	45	1	4	4	9	3	N	N	N	0	0	0	0
N-13	853	45	18.65	SALV	83	1911	20.781	1	4	4	9	1	N	N	N	0	0	0	0
N-13	853	46	13.86	SALV	89	1914	38.204	1	4	4	9	2	N	N	N	0	0	0	0
N-13	853	47	25.41	SALV	84	1915	20.281	0	3	3	9	3	N	N	N	0	0	0	0
N-13	853	52	8.78	SALV	83	1916	38.338	1	3	3	9	1	N	N	N	0	0	0	0
N-13	854	8	28	SALV	83	1911	40	0	1	1	9	2	Y	N	N	0	0	0	0
N-13	854	10	20.54	SALV	89	1905	56.746	2	2	3	9	2	Y	N	N	0	0	0	0
N-14	854	13	15.57	SALV	83	1905	37.816	1	3	3	9	3	N	N	N	0	0	0	0
N-13	854	15	24.46	SALV	83	1916	38.169	0	4	4	9	1	N	N	N	0	0	0	0
N-13	854	18	11.28	SALV	89	1916	40.713	2	4	4	9	1	Y	N	N	0	0	0	0
N-13	854	21	1.69	SALV	83	1908	46	1	4	4	9	1	N	N	N	0	0	0	0
N-13	854	24	10.8	SALV	81	1906	39.356	0	3	3	9	1	N	N	N	0	0	0	0
N-13	854	26	18	SALV	83	1910	38	0	1	1	4	0	Y	N	N	0	0	0	0
N-13	854	27	5.85	SALV	83	1911	24	0	1	1	9	0	N	N	N	0	0	0	0
N-13	854	28	9.46	GREEN	83	1996	50	0	3	3	4	3	Y	N	N	0	0	0	0
N-13	854	33	1.52	SALV	89	1908	66.898	1	4	4	9	1	N	N	N	0	0	0	0
N-13	854	35	15.62	SALV	83	1913	36	1	4	4	9	2	N	N	N	0	0	6	6
N-13	854	37	2.53	SALV	83	1908	51	0	3	3	9	3	N	N	N	0	0	4.108	4.108
N-13	854	39	12.27	SALV	83	1910	33	1	4	4	9	2	N	N	N	0	0	0	0
N-13	854	40	20	GREEN	83	1996	50	0	2	2	4	3	Y	N	N	0	0	0	0
N-13	854	57	15	SALV	84	1910	40	0	1	1	9	2	Y	N	N	0	0	0	0

N-13	854	59	18.56	SALV	83	1911	35	1	3	3	9	3	N	N	N	0	0	0	0
N-14	854	60	10.38	SALV	83	1916	45.45	1	4	4	9	2	N	N	N	0	0	0	0
N-13	854	62	10.98	SALV	83	1913	48	0	4	4	9	1	N	N	N	0	0	0	0
M-14	865	25	3.13	SALV	89	1915	68	1	4	4	1	0	N	N	N	0	0	0	0
L-14	865	52	21.73	SALV	89	1945	61.682	1	4	4	0	0	N	N	N	0	3.0422	4.346	7.3882
L-14	865	67	18.88	SALV	81	1920	20.417	1	4	4	0	0	N	N	N	0	0	3.776	3.776
L-14	865	77	2.79	SALV	89	1925	47	1	4	4	1	0	N	N	N	0	0	0	0
M-14	866	2	12.61	SALV	89	1935	38.506	1	4	4	1	0	N	N	N	0	0	0	0
M-14	866	6	19.39	SALV	89	1910	36.878	1	4	4	9	0	N	N	N	0	0	0	0
M-14	866	12	19.35	SALV	89	1930	39.371	1	4	4	4	0	N	N	N	0	0	4.6	4.6
M-14	866	31	27	SALV	89	1910	35.2	1	4	4	9	0	N	S	N	0	0	0	0
M-14	866	44	2.34	SALV	81	1915	13.16	1	4	4	9	3	N	N	N	0	0	0	0
M-14	866	45	21.52	SALV	89	1910	39.691	0	4	4	9	0	N	N	N	0	0	0	0
N-14	868	5	21.43	SALV	89	1920	44.676	1	4	4	9	2	N	N	N	0	1.5904	0	1.5904
N-14	868	13	6.16	SALV	89	1935	59.286	0	4	4	9	1	N	N	N	0	0.6008	0	0.6008
M-14	868	14	17.36	SALV	89	1916	37.724	1	0	4	9	1	N	N	N	0	0	0	0
M-14	868	16	7.75	SALV	89	1910	61.176	2	3	3	9	2	Y	N	N	0	0	7.75	7.75
N-14	868	20	6.24	SALV	89	1907	60.047	1	4	4	9	3	N	N	N	0	0	0	0
N-14	868	27	19.88	SALV	83	1910	39.292	3	4	4	9	1	Y	N	N	0	0	0	0
N-14	868	28	7.51	SALV	83	1920	41	1	4	4	9	1	N	N	N	0	0	3.472	3.472
N-13	869	1	10.31	SALV	89	1903	75	1	4	4	9	0	N	S	N	0	0	0	0
N-14	869	5	19	SALV	89	1901	58.491	1	4	4	9	3	N	N	N	0	0	0	0
N-14	869	8	5.99	SALV	83	1910	35	0	4	4	9	2	N	N	N	0	0	0	0
N-14	869	9	9	SALV	89	1904	57.273	1	4	4	9	3	N	N	N	0	0.909	0	0.909
N-14	869	11	11.43	SALV	83	1910	52.909	0	4	4	9	2	N	N	N	0	0	0	0
N-14	869	13	19.86	SALV	84	1910	35.1	0	4	4	9	3	N	N	N	0	0	0	0
N-13	869	20	11.9	SALV	83	1909	37.116	1	4	4	9	3	N	N	N	0	0	0	0
N-13	869	21	11.73	SALV	83	1925	39.402	1	1	1	9	3	N	N	N	0	1.08	0	1.08
N-14	869	25	10.1	SALV	89	1915	59.281	1	3	3	9	3	N	R	N	0	0	0	0

M-15	870	4	19.79	SALV	85	1903	19.303	0	4	4	9	0	N	S	N	0	0	0	0
M-15	870	8	36	SALV	89	1903	33.268	0	4	4	9	0	N	N	N	0	0	0	0
M-15	870	76	11.33	SALV	84	1910	38.284	0	4	4	9	0	N	N	N	0	0	0	0
M-15	870	80	7.97	SALV	84	1925	61.553	0	4	4	9	2	N	N	N	0	0	0	0
M-15	871	6	5.05	SALV	89	1918	40.055	0	4	4	9	0	N	N	N	0	0	0	0
M-15	871	8	13.34	SALV	84	1897	37.677	0	4	4	9	1	N	N	N	0	0	0	0
M-15	871	12	8.53	SALV	89	1903	14.438	0	4	4	9	0	N	N	N	0	0	0	0
M-15	871	17	14.34	SALV	89	1889	29.584	0	4	4	9	0	N	S	N	10.592	0	0	10.592
M-15	871	18	13.97	SALV	83	1904	36.4	1	4	4	9	0	N	N	N	0	0	4.295	4.295
L-15	871	21	7.6	SALV	84	1903	58.616	0	4	4	9	3	N	N	N	0	0	4.77	4.77
M-15	871	45	6.16	SALV	83	1904	36.143	1	4	4	9	1	N	N	N	0	0	0	0
M-15	871	46	20.83	SALV	89	1892	18.056	0	4	4	9	1	N	N	N	0	0	2.316	2.316
L-15	871	51	18.33	SALV	89	1916	31.907	1	4	4	9	3	N	R	N	0	0	8.13	8.13
M-15	871	63	12.88	SALV	84	1900	27.108	0	4	4	9	0	N	N	N	0	0	12.88	12.88
L-15	871	65	13.55	SALV	83	1913	63	1	4	4	9	0	N	N	N	0	0	0	0
M-15	871	66	41.5	SALV	84	1918	39.2	0	4	4	9	1	N	N	N	0	0	6.249	6.249
M-15	871	68	3.84	SALV	89	1915	33	0	4	4	9	2	N	N	N	0	0	6.16	6.16
L-15	871	88	11.64	SALV	89	1916	38.884	0	4	4	9	0	N	N	N	0	0	7.6	7.6
L-15	871	92	8.59	SALV	84	1916	33.25	0	4	4	9	0	N	N	N	0	0	0	0
L-15	871	96	9.54	SALV	84	1925	33.868	0	4	4	9	4	N	N	N	0	3.4827	0	3.4827
L-15	871	101	16.3	SALV	89	1930	39.583	0	4	4	9	3	N	N	N	0	0	4.265	4.265
L-15	871	106	5.79	SALV	84	1903	41.279	0	4	4	9	3	N	N	N	0	0	0	0
L-15	872	15	16.84	SALV	89	1910	71	0	3	3	9	0	N	N	N	0	0	0	0
L-15	872	18	21.88	SALV	83	1918	39	0	4	4	4	0	N	N	N	0	0	0	0
K-14	873	3	14.5	SALV	89	1898	37.881	2	3	3	4	2	Y	R	N	0	0	0	0
K-14	873	22	63.43	SALV	84	1918	63	1	4	4	9	0	N	N	N	0	0	0	0
K-15	873	24	22.29	SALV	84	1908	75	1	4	4	9	0	N	N	N	0	0	0	0
L-15	882	10	12.49	GREEN	89	1899	98	2	4	4	4	0	Y	N	N	0	0	0	0
L-15	882	11	21.96	GREEN	83	1883	88	1	4	4	9	0	N	N	N	8	0	0	0

L-15	882	12	8.46	SALV	89	1907	40.452	0	4	4	9	0	N	N	N	0	0	6.174	6.174
L-15	882	19	22.5	SALV	84	1921	42.586	1	4	4	9	0	N	N	N	0	0	0	0
L-15	882	21	15.41	SALV	84	1901	26.817	1	4	4	9	0	N	N	N	0	0	3.082	3.082
L-15	882	36	15.86	SALV	84	1925	30.706	0	4	4	9	1	N	N	N	0	0	2.498	2.498
L-15	882	80	30.87	GREEN	83	1905	95	1	3	3	4	0	N	N	N	0	0	4.23	4.23
L-15	882	89	8	GREEN	83	1905	80	0	3	3	9	0	N	N	N	0	0	4.392	4.392
L-16	882	91	11	GREEN	83	1902	85	0	3	3	9	0	N	N	N	0	0	4	4

TREATMENT PROPOSALS

In all cases, a certified silviculturist reviewed the stand data to determine what kind of vegetative treatment should be considered. Choosing the optimum harvest method for the regeneration of a particular stand is influenced by the silvicultural requirements of the species on site, existing stand conditions, long term management objectives as described in the Forest Plan and professional experience.

The National Forest Management Act of 1976 and the resulting Secretary's Regulations (36 CFR 219.15) require that vegetation management practices be chosen that are appropriate to meet the objectives and requirements of the Land and Resource Management Plan. The use of even-age management is appropriate for the regeneration of species and forest types found on the ANF.

White tailed deer cause extensive damage by feeding on seedlings of tree species found on the ANF. Only even-aged methods that provide abundant sunlight enabling seedling to quickly grow out of the reach of deer are practical. Even then, reforestation practices (such as fencing, fertilization, and site preparation) are often necessary. The choice of silvicultural systems would be wider were in not for the unusually high deer browsing that occurs on the ANF. Clearcutting provides the optimal response. In one step, it provides abundant sunlight to existing tree seedlings permitting them to rapidly develop. Shelterwood systems are also an appropriate means of establishing seedlings and providing conditions that allow for the rapid growth of seedlings. (Forest Plan, pp. D 7-9)

Clearcutting is the optimum method for maintaining aspen due to its intolerance for shade and it physiological requirements for suckering. Both seedling and root suckers are intolerant of shade; those that fall below the canopy stop growing and die within a few years (Forest Plan, p. D-6).

Development of the Proposed Action

In the proposed action, the majority of stands receive even-aged intermediate or regeneration harvests. Uneven-aged management is proposed in MA 2 where it is biologically feasible and in a select few stands in MA 3 where conditions lend themselves to including uneven-age management as a part of the ANF's adaptive management program.

The site-specific, present condition for an individual stand was evaluated in the development of the proposed action. First priority for consideration for treatment was given to stands where impacts from tree mortality and decline were evident. For these stands, treatments were proposed that meet East Side project objectives of achieving sustainable forests and for salvaging dead and dying trees. Second priority for consideration for treatment was given to stands where impacts from tree mortality and decline were less, but opportunity to meet East Side project objectives exist. These stands meet objectives related to achieving the age class distributions outlined in the Forest Plan, maintaining healthy forested stands that achieve long-term Forest Plan vegetative management objectives, and achieving wildlife habitat objectives.

The initial stand assessment considered the healthy relative density for a given stand.

- If less than 40% - regenerate the stand, objective is salvage.
- If relative density is from 41% to 59% - salvage thinning – remove only dead and dying trees. OR if stand is in an area where 0-10 year age class is less than Forest Plan DFC, then consider regeneration harvest – green objective.
- If relative density is from 60% to 79% and volume being harvested is primarily dead and dying

timber – salvage thinning. Can include healthy trees if needed to reduce residual stand density to 60%. If volume being harvested is primarily healthy trees – green thinning OR if stand is in an area where 0-10 year age class is less than Forest Plan DFC, then consider regeneration harvest – green objective.

- If relative density is ≥ 80% and volume being harvested is primarily dead and dying – salvage thinning. Can include healthy trees if needed to reduce residual stand density to 60% (or by 1/3 if original relative density > 95%). If volume being removed is primarily healthy trees – green thinning OR if stand is in an area where 0-10 year age class is less than Forest Plan DFC, then consider regeneration harvest – green objective.

If regeneration harvests are selected, the condition of understory vegetation was evaluated to determine which reforestation activities would be included. The following treatments were considered:

- Site Preparation Striped Maple – When beech/striped maple class is ≥ 2, this treatment is selected to remove stems that interfere with the development of seedlings. If selected for even-aged management, remove both beech and striped maple. If selected for uneven-aged management, remove only striped maple. Retain beech for uneven-aged regeneration component.

- Herbicide – When total interference is > 2, this treatment is selected to remove understory vegetation that interferes with the development of seedlings. Herbicide is also used to prepare site for fill-in planting.

- Plant – When advanced regeneration is lacking in small areas of a stand, or when seed source is not well distributed throughout a stand, fill-in planting is used to supplement natural regeneration.

- Site Preparation, Natural Regeneration – This treatment is used when the quantity of non-commercial stems left on site interfere with the development of natural regeneration.

- Fence – This includes both area fencing and individual tree shelters. Area fences are used in locations where deer browse is high and limited sources of alternative browse (i.e., other stands in the 0-5 year age class) exist. Individual tree shelters can be used in combination with fill-in planting as a means of protecting planted stock from deer browse.

- Fertilization – This treatment is used to accelerate the development of natural regeneration. Small seedlings are susceptible to browsing by deer. Taller seedlings are less susceptible to damage from deer. By accelerating the height growth of seedlings, increased regeneration success can be achieved.

- Release – This treatment is used in regenerating stands (8-20 years old) where species composition is being dominated by species that do not meet the long-term management objectives for the stand. In some stands, birch seedlings dominate the regenerating stand and overshadow the more desirable black cherry, red maple and other upland hardwood species. Selective removal of most of the birch ensures that the long-term management objectives will be met.

Development of Alternatives 2 through 5

Issues identified in the course of analysis for the East Side project resulted in the development of four alternatives to the Proposed Action. Alternatives were developed to respond to:

1. Issues associated with the amount and kind of timber harvest that might take place, and whether or not harvest should occur in conjunction with other reforestation activities;

2. Issues related to harvest associated with only the removal of dead and dying trees;

3. Issues related to the use of herbicides;

4. Issues related to the construction of new roads; and

5. Issues related to the use of even-aged or uneven-aged management.

In Alternative 2, neither even-aged nor uneven-aged management is practiced. The only harvest emphasis is to remove merchantable dead and dying trees. No attempt is made to either manipulate individual stand structures more or less towards even- or uneven-aged structure. However, given the strongly even-aged nature of most stands, the result will be even-aged. There is no attempt made to establish regeneration in harvested areas. Given the existing understory condition, it is improbable that natural regeneration will develop. This Alternative responds to issues 1, 2, 3 and 4.

In Alternative 3, commercial harvests occur only where existing road systems are available for access. The same silvicultural management philosophy for treatment is considered as in Alternative 1, however no new roads are constructed. Even-aged management is the featured silvicultural system, except for stands located within MA 2 and for a select few stands in MA 3. The primary differences between Alternative 1 and Alternative 3, are that commercial harvests are not proposed for stands where new road construction occurs in Alternative 1 and that only reforestation treatments (without commercial regeneration harvest) are proposed for stands where healthy relative density is $\leq$ 40% and road construction would have been required in Alternative 1. This Alternative responds to issues 1, 3, and 4.

In Alternative 4, uneven-aged management is proposed on sites included in the proposed action where site characteristics, overstory tree species composition or beech roost sucker development make it biologically feasible. This includes giving careful consideration to stands located within visually sensitive areas, riparian areas, and on wet soils. Reforestation treatments needed to ensure the successful establishment of seedlings is also proposed. Reforestation treatments are also proposed in stands where healthy relative densities are $\leq$ 40% and uneven-aged harvests are not feasible. This Alternative responds to issues 1, 3 and 5.

There are no new vegetative management treatments proposed in Alternative 5. This Alternative responds to issues 1 and 3.

Alternative Treatment Table Definitions

The Alternative Treatment Table (Table 23) identifies the stands and treatments that are proposed in each alternative. Total stand acres are indicated in the acres column. Acres shown in each of the columns where reforestation activities are prescribed reflect the actual number of acres within a stand for a particular treatment. In some instances, partial stand treatments are indicated.

MAP ID – Page 2 of the Map Section provides an index to the section map for a particular stand location. Refer to the section map for greater detail for individual stands.

CMP – Compartment – Land areas on the ANF are subdivided into units called compartments (normally 500 to 1,000 acres in size). Compartment boundaries usually follow roads, streams, ridgelines or some other identifiable boundary.

ST – Stand – Land areas within compartments are further subdivided into stands. Stand boundaries are defined as areas with similar species distribution, stocking, and age. Previous and on-going management decisions, and site capability/management limitations also determine stand boundaries.

AC – Acres – Stand acreage calculated using Geographic Information System polygons.

OBJ – Objective – Identifies the primary objective considered when selecting stand treatments.

SALV – For thinnings, used where more than 50% of the volume is dead or dying. For regeneration harvests, used where healthy relative density is ≤ 40%.

GREEN – For thinnings, used where more than 50% of the volume is from healthy trees. For regeration harvests, used where healthy relative density is > 40%.

WL – Stands being treated to achieve wildlife management objectives.

The following column headings may be found for each of the Alternatives. Code definitions are the same for each alternative. Note there are no reforestation activities proposed in Alternative 2.

ALT - Alternative - Identifies stands that are included for the particular alternative.

Y - Yes, stand treatments is proposed in the alternative.

N - No, stand treatment is not proposed in the alternative.

CUT1 - First Harvest Method - Identifies the method of cut for the first round of harvests (scheduled to occur within the next 1-3 years). See Chapter 3, pages 104 – 110, 115 – 116 for a description of treatments and discussion of effects of treatments.

0 - No harvest in the first entry, harvest will be deferred until second entry
113 - Clearcut
114 - Salvage Clearcut
122 - Two-age Prep cut
131 - Shelterwood Seed cut
132 - Two-age cut
141 - Shelterwood Removal
151 - Individual Tree Selection
152 - Group Selection
210 - Transition Cut
220 - Intermediate Thinning
231 - Salvage Thinning
999 - No harvest, reforestation activities only

CUT2 - Second Harvest Method - Identifies the method of cut for the second round of harvests (scheduled to occur within 5-10 years). Second entry harvests are proposed only in Alternatives 1 and 3.

0 - No second entry harvest is scheduled
132 - Two-age cut
141 - Shelterwood Removal

The following column headings denote the particular reforestation treatments that are prescribed for a stand. Values in each column indicate the number of acres within a stand that are to receive the treatment. More detailed descriptions of treatments and discussion of effects are found in Chapter 3 , pages 117 – 122.

SP STM - Site Preparation, Striped Maple Cutting - This involves the cutting of mid-story striped maple, beech or other selected woody species in order to reduce shading and to promote the development of desired tree species.

HERB - Herbicide Application - The ground application of sulfometuron methyl or glyphosate (or a combination of the two) on sites where dense coverage of grasses, fern, beech root suckers and striped maple are found. This treatment occurs on sites where new seedlings are to be established in

order to perpetuate well-stocked forest cover.

PLANT - Planting of tree and shrub species - includes planting of native species such as shrubs, hardwood trees, hemlock, red pine, and white pine.

SP NR - Site Preparation for Natural Regeneration - This involves the cutting of saplings and small pole-sized stems following the shelterwood removal cut or clearcut where these stems interfere with the development and growth of seedlings.

FNCE - Area Fence or Individual Tree Fence - Fences provide protection for seedlings from browsing by deer. Individual tree fences help stimulate tree growth by creating 'miniature green house' conditions.

FERT - Fertilization - This treatment stimulates or maintains vigorous seedling height growth, permitting them to quickly grow beyond a height at which deer are able to browse them.

REL - Release - This involves the non-commercial cutting of tall-growing woody vegetation (generally seedling or sapling size) that interferes with the tree seedlings, saplings, or shrubs that are desired on a site.

Table 23. Eastside Alternative Treatment Table

STAND IDENTIFICATION					ALTERNATIVE ONE										ALT 2		ALTERNATIVE THREE										ALTERNATIVE FOUR							
MAP ID	CMP	ST	AC	OBJ	ALT 1	CUT 1	CUT 2	SP StM	Herb	Plant	SP NR	Fnce	Fert	Rel	ALT 2	CUT 1	ALT 3	CUT 1	CUT 2	SP StM	Herb	Plant	SP NR	Fnce	Fert	Rel	ALT 4	CUT 1	Herb	SP StM	Plant	Fnce	SP NR	Rel
H-11	309	3	13	SALV	Y	114	0	0	13	0	13	0	13	0	N	0	Y	114	0	0	13	0	13	0	13	0	Y	999	13	0	0	0	13	0
H-11	309	10	7	SALV	Y	114	0	0	0	0	7	0	7	0	N	0	Y	114	0	0	0	0	7	0	7	0	Y	151	0	0	0	0	0	0
H-11	309	11	18	SALV	Y	114	0	0	18	0	18	0	18	0	N	0	Y	114	0	0	18	0	18	0	18	0	Y	999	18	0	0	0	18	0
H-11	310	10	8	SALV	Y	114	0	0	8	0	8	0	8	0	N	0	Y	114	0	0	8	0	8	0	8	0	Y	999	8	0	0	0	8	0
M-2	439	13	37	SALV	Y	131	141	37	37	0	0	37	0	0	Y	231	Y	131	141	37	37	0	0	37	0	0	Y	231	37	37	0	37	0	0
M-2	439	41	27	SALV	Y	131	141	27	27	0	0	0	0	0	Y	231	Y	131	141	27	27	0	0	0	0	0	Y	231	27	27	0	0	0	0
N-3	440	19	20	SALV	Y	131	141	20	20	0	0	20	0	0	Y	231	Y	131	141	20	20	0	0	20	0	0	Y	151	0	20	0	0	0	0
M-3	440	40	21	SALV	Y	131	141	21	21	0	0	21	0	0	Y	231	Y	131	141	21	21	0	0	21	0	0	Y	231	21	21	0	21	0	0
L-3	445	5	16	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	Y	151	16	16	0	0	0	0
L-3	445	9	55	SALV	Y	0	141	55	55	0	0	55	0	0	N	0	Y	0	141	55	55	0	0	55	0	0	Y	151	0	55	0	0	0	0
L-3	445	10	10	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	Y	151	10	10	0	0	0	0
L-3	445	14	16	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
L-3	445	16	40	SALV	Y	0	141	40	40	0	0	40	0	0	N	0	Y	0	141	40	40	0	0	40	0	0	Y	151	0	40	0	0	0	0
N-7	484	5	43	GREEN	Y	151	0	43	43	43	0	43	0	43	N	0	Y	151	0	43	43	43	0	43	0	43	Y	151	43	43	43	43	0	43
N-7	484	8	32	GREEN	Y	152	0	32	32	0	0	0	0	32	N	0	Y	152	0	32	32	0	0	0	0	32	Y	152	32	32	0	0	0	32
N-7	484	29	25	GREEN	Y	152	0	25	25	0	0	0	0	25	N	0	Y	152	0	25	25	0	0	0	0	25	Y	152	25	25	0	0	0	25
O-7	484	30	27	GREEN	Y	152	0	27	0	0	0	0	0	27	N	0	Y	152	0	27	0	0	0	0	0	27	Y	152	0	27	0	0	0	27
O-7	484	31	25	GREEN	Y	152	0	25	25	0	0	25	0	25	N	0	Y	152	0	25	25	0	0	25	0	25	Y	152	25	25	0	0	0	25
O-6	484	32	60	SALV	Y	999	0	60	60	0	0	0	0	0	N	0	Y	999	0	60	60	0	0	0	0	0	Y	999	60	60	0	0	0	0
O-7	484	33	12	SALV	Y	151	0	12	12	12	0	12	0	12	N	0	Y	151	0	12	12	12	0	12	0	12	Y	151	12	12	12	12	0	12
O-7	484	43	23	GREEN	Y	152	0	23	23	0	0	0	0	23	N	0	Y	152	0	23	23	0	0	0	0	23	Y	152	23	23	0	0	0	23
O-7	484	44	22	GREEN	Y	152	0	22	22	0	0	0	0	22	N	0	Y	152	0	22	22	0	0	0	0	22	Y	152	22	22	0	0	0	22
O-7	484	45	25	SALV	Y	152	0	25	25	25	0	25	0	25	Y	231	Y	152	0	25	25	25	0	25	0	25	Y	152	25	25	25	25	0	25
O-6	484	46	33	SALV	Y	152	0	33	33	33	0	33	0	33	Y	231	Y	152	0	33	33	33	0	33	0	33	Y	152	33	33	0	0	0	33
N-6	484	48	22	SALV	Y	152	0	22	22	22	0	22	0	22	Y	231	Y	152	0	22	22	22	0	22	0	22	Y	152	22	22	22	22	0	22

N-6	484	49	35	SALV	Y	152	0	35	0	0	0	0	0	35	Y	231	Y	152	0	35	0	0	0	0	0	35	Y	152	0	35	0	0	0	35
N-7	484	52	20	GREEN	Y	151	0	20	0	0	0	0	0	20	N	0	Y	151	0	20	0	0	0	0	0	20	Y	151	0	20	0	0	0	20
O-6	485	1	28	SALV	Y	131	141	28	28	0	0	28	0	0	Y	231	Y	131	141	28	28	0	0	28	0	0	Y	231	28	28	0	28	0	0
O-7	485	25	22	SALV	Y	131	141	22	22	0	0	22	0	0	Y	231	Y	131	141	22	22	0	0	22	0	0	Y	231	22	22	0	22	0	0
O-7	485	28	18	SALV	Y	131	141	18	18	0	0	18	0	0	Y	231	Y	131	141	18	18	0	0	18	0	0	Y	231	18	18	0	18	0	0
O-6	485	43	8	SALV	Y	999	0	0	8	0	0	0	0	0	N	0	Y	999	0	0	8	0	0	0	0	0	Y	999	8	0	0	0	0	0
I-5	492	19	20	SALV	Y	999	0	20	20	0	0	20	0	0	N	0	Y	999	0	20	20	0	0	20	0	0	Y	999	20	20	0	20	0	0
I-5	492	20	45	SALV	Y	131	141	45	45	0	0	45	0	0	Y	231	Y	131	141	45	45	0	0	45	0	0	Y	231	45	45	0	45	0	0
I-6	493	9	19	SALV	Y	999	0	19	19	0	0	19	0	0	N	0	Y	999	0	19	19	0	0	19	0	0	Y	999	19	19	0	19	0	0
I-6	493	10	51	SALV	Y	999	0	51	51	0	0	51	0	0	N	0	Y	999	0	51	51	0	0	51	0	0	Y	999	51	51	0	51	0	0
C-16	639	2	13	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
C-16	639	5	14	SALV	Y	141	0	14	1	1	0	1	14	0	Y	231	Y	141	0	14	1	1	0	1	14	0	Y	231	1	14	1	1	0	0
C-16	639	7	26	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
D-16	639	10	0	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
C-16	639	17	21	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	0	21	0	0	0	0
C-16	639	64	10	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	0	10	0	0	0	0
C-16	639	67	4	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	0	4	0	0	0	0
D-16	641	26	18	SALV	Y	131	141	18	18	11	0	11	18	0	Y	231	Y	131	141	18	18	11	0	11	18	0	Y	151	0	0	0	0	0	0
D-16	641	31	16	SALV	Y	131	141	0	16	6	0	6	16	0	Y	231	Y	131	141	0	16	6	0	6	16	0	Y	231	16	0	3	3	0	0
D-16	641	42	41	SALV	Y	131	141	41	41	0	0	0	0	0	Y	231	Y	131	141	41	41	0	0	0	0	0	Y	151	0	41	0	0	0	0
D-16	641	44	14	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	14	14	0	0	0	0
D-15	641	82	25	SALV	Y	131	141	25	25	12	0	12	25	0	Y	231	Y	131	141	25	25	12	0	12	25	0	Y	231	0	0	0	0	0	0
D-16	641	86	14	SALV	Y	131	141	14	14	0	0	0	0	0	Y	231	Y	131	141	14	14	0	0	0	0	0	Y	151	0	0	0	0	0	0
C-16	641	166	9	SALV	Y	141	0	9	0	0	0	0	9	0	Y	231	Y	141	0	9	0	0	0	0	9	0	Y	151	0	9	0	0	0	0
D-15	642	1	26	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	26	26	0	0	0	0
D-15	642	4	14	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	14	14	0	0	0	0
D-16	642	6	9	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	0	9	0	0	0	0
C-16	642	13	1	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
D-16	642	16	43	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	0	43	0	0	0	0

D-16	642	17	8	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
C-16	642	18	9	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	9	9	0	0	0	0
D-16	642	21	13	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	13	0	0	0	0	0
D-16	642	23	3	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
D-16	642	24	46	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	45	45	0	0	0	0
D-16	642	25	28	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	0	29	0	0	0	0
C-16	642	27	4	SALV	Y	131	141	4	2	2	0	4	0	0	Y	231	Y	131	141	4	2	2	0	2	0	0	Y	151	0	4	0	0	0	0
D-15	642	29	17	SALV	Y	131	141	17	17	11	0	11	0	0	Y	231	Y	131	141	17	17	11	0	11	0	0	Y	151	17	17	0	0	0	0
C-16	642	30	2	SALV	Y	141	0	2	2	1	0	1	2	0	Y	231	Y	141	0	2	2	1	0	1	0	0	Y	231	2	2	1	1	0	0
D-14	651	19	19	SALV	Y	131	141	19	19	5	0	5	0	0	Y	231	Y	131	141	19	19	5	0	5	0	0	Y	231	19	19	3	3	0	0
E-14	651	25	7	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	7	0	0	0	0	0
E-14	651	78	6	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
F-14	675	14	11	SALV	Y	999	0	0	11	11	0	0	0	0	N	0	Y	999	0	0	11	11	0	0	0	0	Y	999	6	0	6	0	0	0
F-14	675	16	29	SALV	Y	131	141	0	29	10	0	10	0	0	Y	231	Y	131	141	0	29	10	0	10	0	0	Y	231	29	0	5	5	0	0
F-14	675	20	6	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
F-13	675	21	9	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
F-13	675	27	10	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
E-14	675	41	4	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	4	0	0	0	0	0
E-14	675	42	13	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
E-14	675	43	16	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	16	0	0	0	0	0
E-14	675	44	17	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
E-14	675	45	22	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
E-14	675	50	23	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
F-14	675	51	15	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
F-13	675	53	11	SALV	Y	231	0	0	0	0	0	0	0	0	N	0	Y	231	0	0	0	0	0	0	0	0	Y	151	11	0	0	0	0	0
F-14	675	58	18	SALV	Y	231	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
E-14	675	61	16	SALV	Y	231	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
E-14	675	64	31	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
E-14	675	66	3	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0

E-13	675	67	34	SALV	Y	131	141	10	24	10	0	15	0	0	Y	231	Y	131	141	10	24	10	0	15	0	0	Y	231	24	10	5	5	0	0
F-13	675	72	18	SALV	Y	231	0	0	0	0	0	0	0	0	N	0	Y	231	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
F-14	675	78	19	SALV	Y	231	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
E-14	675	79	10	SALV	Y	231	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
E-14	675	87	6	SALV	Y	231	0	0	0	0	0	0	0	0	N	0	Y	231	0	0	0	0	0	0	0	0	Y	151	6	0	0	0	0	0
E-13	675	92	3	SALV	Y	131	141	0	3	3	0	0	0	0	Y	231	Y	131	141	0	3	3	0	0	0	0	Y	151	3	0	0	0	0	0
F-14	675	104	6	SALV	Y	231	0	0	0	0	0	0	0	0	N	0	Y	231	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
F-14	675	107	17	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
F-13	675	110	8	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
F-14	675	112	5	SALV	Y	131	141	5	5	5	0	0	0	0	Y	231	Y	131	141	5	5	5	0	0	0	0	Y	231	5	5	5	5	0	0
F-15	684	1	28	GREEN	Y	113	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
G-15	684	11	30	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
G-15	684	14	26	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
G-15	684	18	5	GREEN	Y	113	0	0	5	5	0	5	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
G-15	684	28	4	GREEN	Y	0	141	0	4	0	4	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
F-15	684	29	5	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
F-15	684	30	7	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
F-15	684	31	10	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
F-15	684	32	3	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
G-15	684	35	7	GREEN	Y	0	132	0	7	7	7	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
F-15	684	56	6	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	6	0	0	0	0	0
G-15	684	57	6	GREEN	Y	131	141	0	6	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
H-13	700	2	23	GREEN	Y	131	141	23	23	3	0	3	0	0	N	0	Y	131	141	23	23	3	0	3	0	0	N	0	0	0	0	0	0	0
H-13	700	8	40	SALV	Y	232	0	1	1	1	0	1	0	0	Y	231	Y	232	0	1	1	1	0	1	0	0	Y	151	40	40	0	0	0	0
H-13	700	9	5	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	1	0	0	N	0	0	0	0	0	0	0
H-14	700	13	13	SALV	Y	0	141	13	13	2	0	13	0	0	Y	231	Y	0	141	13	13	2	0	13	0	0	Y	151	0	13	0	0	0	0
H-13	700	14	12	GREEN	Y	131	141	12	12	2	0	12	0	0	N	0	Y	131	141	12	12	2	0	12	0	0	N	0	0	0	0	0	0	0
H-14	700	16	16	SALV	Y	141	0	0	0	0	0	16	16	16	Y	231	Y	141	0	0	0	0	0	16	16	16	Y	231	0	0	0	0	0	0
H-14	700	18	14	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0

H-14	700	21	16	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
H-14	700	22	15	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
H-14	700	25	21	SALV	Y	0	141	21	21	2	0	21	0	0	Y	231	Y	999	0	21	21	2	0	21	0	0	Y	151	0	21	0	0	0	0
H-14	700	32	12	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
H-14	700	34	17	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	17	17	0	0	0	0
H-14	700	35	29	SALV	Y	131	141	29	29	3	0	3	0	0	N	0	Y	131	141	29	29	3	0	3	0	0	Y	151	29	29	0	0	0	0
H-14	700	37	19	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
H-14	700	38	11	SALV	Y	131	141	11	11	0	0	0	0	0	Y	231	Y	131	141	11	11	0	0	0	0	0	Y	231	11	11	0	0	0	0
H-14	700	40	23	GREEN	Y	999	0	0	0	0	0	0	0	23	N	0	Y	999	0	0	0	0	0	0	0	23	Y	999	0	0	0	0	0	23
H-14	700	44	11	GREEN	Y	131	141	11	11	0	0	0	0	0	N	0	Y	131	141	11	11	0	0	0	0	0	N	0	0	0	0	0	0	0
G-14	700	45	18	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
H-14	700	51	30	GREEN	Y	131	141	30	30	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
G-14	700	56	24	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
H-14	700	57	30	SALV	Y	0	141	0	30	3	0	30	0	30	N	0	Y	0	141	0	30	3	0	30	0	30	Y	151	0	0	0	0	0	0
H-14	700	61	25	SALV	Y	0	141	0	25	10	0	25	0	0	Y	231	Y	0	141	0	25	10	0	25	0	0	Y	231	5	0	0	25	0	0
H-14	700	63	12	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	0	12	0	0	0	0
H-14	700	64	14	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	14	14	0	0	0	0
G-15	700	67	57	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
H-14	700	70	13	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
G-14	700	71	6	SALV	Y	0	141	0	6	1	0	6	0	6	N	0	Y	0	141	0	6	1	0	6	0	6	Y	999	6	6	1	6	0	0
G-15	700	77	16	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
G-14	700	83	16	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
G-14	700	85	15	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
G-15	700	91	23	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
H-14	700	96	3	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
H-14	700	97	13	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	Y	151	13	0	0	0	0	0
H-14	700	98	20	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	Y	151	0	20	0	0	0	0
H-14	700	99	22	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
H-14	700	102	18	GREEN	Y	210	0	0	0	0	0	0	0	0	N	0	Y	210	0	0	0	0	0	0	0	0	Y	151	18	18	0	0	0	0

H-14	700	103	11	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
H-14	700	112	13	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
H-14	700	113	15	GREEN	Y	131	141	15	15	0	0	0	0	0	Y	231	Y	131	141	15	15	0	0	0	0	0	Y	151	15	15	0	0	0	0
H-14	700	114	17	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
H-14	700	115	25	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
H-14	700	124	22	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
H-14	700	125	15	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
H-14	700	129	16	GREEN	Y	113	0	0	8	8	0	0	0	16	N	0	Y	113	0	0	8	8	0	0	0	16	N	0	0	0	0	0	0	0
G-15	700	130	18	SALV	Y	0	141	0	18	2	0	18	0	0	N	0	Y	0	141	0	18	2	0	18	0	0	Y	999	18	0	1	18	0	0
G-14	700	131	12	SALV	Y	0	141	0	12	5	0	12	0	7	N	0	Y	0	141	0	12	5	0	12	0	7	Y	151	0	0	0	0	0	0
H-14	700	132	6	GREEN	Y	131	141	6	0	0	0	0	0	0	Y	231	Y	131	141	6	0	0	0	0	0	0	Y	151	0	6	0	0	0	0
H-14	700	134	4	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
H-14	700	135	8	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
H-14	700	138	6	GREEN	Y	113	0	0	6	1	0	6	0	0	N	0	Y	113	0	0	6	1	0	6	0	0	Y	151	0	0	0	0	0	0
H-13	700	142	12	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
G-14	701	2	19	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
G-14	701	12	5	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	5	0	0	0	0	0
G-14	701	13	34	GREEN	Y	131	141	0	34	0	0	0	0	34	Y	231	Y	131	141	0	34	0	0	0	0	34	Y	231	0	0	0	0	0	0
G-14	701	16	9	GREEN	Y	113	0	0	0	0	0	0	0	0	N	0	Y	113	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
G-14	701	17	10	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
G-14	701	22	71	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
G-14	701	30	5	GREEN	Y	0	141	0	5	3	0	3	0	0	N	0	Y	0	141	0	5	3	0	3	0	0	N	0	0	0	0	0	0	0
G-14	701	31	15	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
G-14	701	35	23	GREEN	Y	131	141	0	23	0	0	0	0	0	Y	231	Y	131	141	0	23	0	0	0	0	0	Y	231	0	0	0	0	0	0
G-14	701	37	15	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	15	0	0	0	0	0
G-14	701	47	10	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
H-14	701	54	10	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
H-14	701	55	17	GREEN	Y	131	141	17	17	0	0	0	0	0	Y	231	Y	131	141	17	17	0	0	0	0	0	Y	151	17	17	0	0	0	0
G-14	701	59	15	SALV	Y	0	141	0	15	1	0	1	15	0	Y	231	Y	0	141	0	15	1	0	1	15	0	Y	231	15	0	1	1	0	0

I-14	712	3	16	GREEN	Y	122	132	0	0	0	0	16	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
I-14	712	8	18	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	18	0	0	0	0	0
I-14	712	11	10	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
I-14	712	12	13	GREEN	Y	113	0	0	2	2	0	13	13	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
I-14	712	16	17	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
I-14	712	17	15	GREEN	Y	131	141	15	15	0	0	0	0	0	N	0	Y	131	141	15	15	0	0	0	0	0	N	0	0	0	0	0	0	0
I-14	712	19	24	GREEN	Y	151	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
I-14	712	20	11	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
I-14	712	23	11	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
I-14	712	25	11	GREEN	Y	113	0	0	0	0	0	11	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
I-14	712	28	32	SALV	Y	122	132	32	32	0	0	0	0	0	N	0	Y	122	132	32	32	0	0	0	0	0	Y	151	32	0	0	0	0	0
J-7	801	6	29	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-7	801	15	16	GREEN	Y	131	141	16	16	2	0	16	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
J-7	801	16	13	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-7	801	17	23	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-7	801	30	39	GREEN	Y	131	141	0	39	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-7	801	31	17	GREEN	Y	122	132	16	16	3	0	16	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-7	801	32	4	GREEN	Y	131	141	4	4	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-7	801	33	13	GREEN	Y	122	132	13	13	3	0	13	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-7	801	34	2	SALV	Y	131	141	2	2	2	0	2	2	0	Y	231	Y	999	0	2	2	2	0	2	2	0	Y	151	2	0	0	0	0	0
J-7	801	38	14	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
J-7	801	39	16	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
J-7	801	40	1	WL	Y	113									N	0	N	0									N	0						
J-7	801	41	19	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
L-9	816	1	16	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
L-9	816	2	25	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
L-9	816	3	21	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
L-9	816	5	21	SALV	Y	131	141	21	21	2	0	21	21	0	Y	231	Y	999	0	21	21	2	0	21	21	0	Y	231	21	21	1	21	0	0
L-9	816	6	9	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	9	0	0	0	0	0

L-8	816	12	62	SALV	Y	132	0	62	62	19	0	62	0	0	Y	231	Y	132	0	62	62	19	0	62	0	0	Y	151	0	0	0	0	0	0
L-9	816	14	7	GREEN	Y	122	132	7	7	2	7	7	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	7	0	0	0	0	0
K-9	816	18	6	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	Y	151	6	0	0	0	0	0
L-9	816	22	14	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	Y	151	14	0	0	0	0	0
K-9	816	24	19	GREEN	Y	131	141	19	19	2	19	19	19	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
L-9	816	26	11	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	Y	151	11	0	0	0	0	0
L-9	816	29	7	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
L-8	816	34	4	SALV	Y	131	141	4	4	2	4	4	4	0	Y	231	Y	999	0	4	4	2	4	4	4	0	Y	231	4	4	2	4	4	0
L-9	816	44	5	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
L-9	816	47	5	GREEN	Y	131	141	5	5	1	5	5	5	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	5	5	0	0	0	0
L-9	816	54	7	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
L-9	816	59	15	SALV	Y	131	141	15	15	2	15	15	15	0	Y	231	Y	999	0	15	15	2	15	15	15	0	Y	151	0	0	0	0	0	0
L-9	816	61	2	SALV	Y	131	141	2	2	1	2	2	2	0	Y	231	Y	0	0	2	2	1	2	2	2	0	Y	231	2	2	1	1	2	0
L-9	816	63	6	GREEN	Y	122	132	6	6	2	0	6	0	0	N	0	Y	122	132	6	6	2	0	6	0	0	Y	151	6	0	0	0	0	0
K-9	816	65	6	SALV	Y	131	141	6	6	2	6	6	6	0	Y	231	Y	131	141	6	6	2	6	6	6	0	Y	151	0	6	0	0	0	0
K-9	816	69	14	SALV	Y	131	141	14	14	2	14	14	14	0	Y	231	Y	999	0	14	14	2	14	14	14	0	Y	231	14	14	1	1	14	0
L-9	816	70	3	GREEN	Y	122	132	0	3	0	0	0	0	0	N	0	Y	122	132	0	3	0	0	0	0	0	Y	151	3	3	0	0	0	0
L-9	816	71	5	GREEN	Y	122	132	5	5	1	0	5	0	0	Y	231	Y	122	132	5	5	1	0	5	0	0	Y	151	0	0	0	0	0	0
L-9	816	72	6	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
L-9	816	74	3	WL	Y	113				3		3			N	0	N	0									N	0						
L-8	816	77	9	GREEN	Y	122	132	9	9	2	0	9	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
L-8	816	82	6	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
L-9	816	86	5	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
L-9	816	87	5	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	Y	151	5	0	0	0	0	0
K-8	817	4	10	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-8	817	6	43	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	0	43	0	0	0	0
K-8	817	9	28	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-8	817	12	27	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	Y	151	0	27	0	0	0	0
K-8	817	13	4	WL	Y	113									N	0	Y	113									Y	113						

K-8	817	15	20	SALV	Y	122	132	20	20	7	0	20	0	0	Y	231	Y	999	0	20	20	7	0	20	0	0	Y	231	20	20	3	20	0	0
K-8	817	16	10	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-8	817	18	16	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-8	817	21	35	GREEN	Y	131	141	35	35	4	35	35	35	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
K-8	817	25	27	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-9	817	26	19	SALV	Y	122	132	19	19	7	0	19	0	0	N	0	Y	999	0	19	19	7	0	19	0	0	Y	999	19	19	3	19	0	0
K-8	817	27	19	GREEN	Y	131	141	19	19	4	19	19	19	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-8	817	28	19	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-9	817	30	105	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-9	817	31	29	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-9	817	32	7	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-9	817	33	23	GREEN	Y	131	141	23	23	7	23	23	23	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-9	817	39	27	GREEN	Y	131	141	27	27	2	27	27	27	0	Y	231	Y	131	141	27	27	2	27	27	27	0	Y	231	0	0	0	0	0	0
K-9	817	42	18	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
K-8	817	43	11	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	11	11	0	0	0	0
K-9	817	45	20	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
K-9	817	48	17	SALV	Y	122	132	17	17	9	0	17	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-8	817	49	12	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	0	12	0	0	0	0
K-9	817	50	14	SALV	Y	232	0	0	0	0	0	0	14	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-8	817	51	30	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-8	817	53	11	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	3	3	0	0	0	0
K-8	818	22	2	SALV	Y	232	0	0	2	2	0	0	0	0	Y	231	Y	232	0	0	2	2	0	0	0	0	Y	231	0	0	0	0	0	0
K-8	818	35	9	GREEN	Y	122	132	9	9	3	0	9	0	0	Y	231	Y	122	132	9	9	3	0	9	0	0	Y	231	0	0	0	0	0	0
K-8	819	1	5	SALV	Y	131	141	5	5	2	0	5	5	0	Y	231	Y	131	141	5	5	2	0	5	5	0	Y	231	0	0	0	0	0	0
K-8	819	2	19	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
K-8	819	3	2	WL	Y	113				2		2			N	0	N	0									N	0						
K-8	819	4	31	GREEN	Y	122	132	31	31	5	0	31	0	0	Y	231	Y	122	132	31	31	5	0	31	0	0	Y	151	0	0	0	0	0	0
K-8	819	6	1	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-8	819	8	5	WL	Y	113									N	0	Y	113									Y	113						

K-8	819	9	20	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	20	0	0	0	0	0
J-8	819	10	25	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-8	819	12	18	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	18	0	0	0	0	0
J-8	819	13	25	SALV	Y	131	141	25	25	6	0	25	25	0	Y	231	Y	999	0	25	25	6	0	25	25	0	Y	231	25	25	3	25	0	0
K-8	819	17	26	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-8	819	22	6	GREEN	Y	131	141	6	6	1	0	6	6	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	6	0	0	0	0	0
K-9	819	23	30	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-8	819	24	11	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-8	819	25	5	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-8	819	26	4	WL	Y	113									N	0	N	0									N	0						
J-8	819	28	23	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-8	819	29	15	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-8	819	30	12	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-8	819	33	11	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
J-8	819	36	15	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-8	819	37	10	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-8	819	38	4	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-8	819	40	12	GREEN	Y	999	0	12	12	12	0	0	0	0	N	0	Y	999	0	12	12	12	0	0	0	0	N	0						
K-8	819	41	10	GREEN	Y	122	132	10	10	1	0	10	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-8	819	45	5	WL	Y	113									N	0	N	0									N	0						
J-8	819	47	14	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-9	820	49	14	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	821	62	5	GREEN	Y	151	0	5	0	0	0	0	0	0	N	0	Y	151	0	5	0	0	0	0	0	0	Y	151	5	5	0	0	0	0
I-9	821	63	9	GREEN	Y	151	0	0	0	0	0	0	0	0	N	0	Y	151	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
I-9	821	68	28	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	0	28	0	0	0	0
I-9	821	69	15	GREEN	Y	131	141	0	15	1	0	1	15	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
I-9	821	71	12	GREEN	Y	151	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
I-9	821	85	15	GREEN	Y	131	141	0	15	2	0	2	15	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	15	0	0	0	0	0
J-9	826	2	5	GREEN	Y	151	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	5	0	0	0	0	0

J-9	826	3	13	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
I-9	826	6	14	GREEN	Y	131	141	14	14	1	0	1	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	14	0	0	0	0	0
J-9	826	8	18	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	826	9	4	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	4	0	0	0	0	0
J-9	826	13	29	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-9	826	18	15	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	826	19	22	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	22	0	0	0	0	0
J-9	826	21	20	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-9	826	28	22	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	826	31	23	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	826	33	14	GREEN	Y	131	141	14	14	2	0	14	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	0	14	0	0	0	0
J-9	826	34	12	GREEN	Y	999	0	0	2	2	0	2	0	12	N	0	Y	999	0	0	2	2	0	2	0	12	Y	999	2	0	2	2	0	12
J-9	826	44	9	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	826	45	30	SALV	Y	0	141	30	30	5	0	30	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-9	826	51	20	GREEN	Y	131	141	0	20	2	0	0	20	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	20	0	0	0	0	0
J-9	826	57	12	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-9	826	59	14	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	826	60	26	GREEN	Y	131	141	0	26	3	0	26	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-9	826	62	25	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	826	63	16	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	826	64	13	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	826	67	12	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	826	68	5	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	826	69	10	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	826	70	38	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	826	75	16	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	826	76	22	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-9	826	84	10	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-9	826	85	20	SALV	Y	151	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	20	0	0	0	0	0

J-9	826	86	8	SALV	Y	151	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	8	0	0	0	0	0
J-9	826	88	13	GREEN	Y	131	141	13	13	1	0	1	13	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-9	826	89	14	SALV	Y	0	141	14	14	1	0	14	14	0	Y	231	Y	999	0	0	14	1	0	14	14	0	Y	231	14	14	1	14	0	0
J-9	826	90	10	SALV	Y	131	141	10	10	1	0	1	10	0	Y	231	Y	999	0	10	10	1	0	1	10	0	Y	231	10	10	1	1	0	0
K-9	827	2	24	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-9	827	14	20	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	20	20	0	0	0	0
K-9	827	15	17	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-9	827	16	22	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-9	827	18	49	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-9	827	24	21	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-10	827	30	19	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-10	827	33	9	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-10	827	34	18	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-10	827	40	19	GREEN	Y	131	141	19	19	1	0	1	19	0	Y	231	Y	999	0	19	19	1	0	1	19	0	Y	151	19	0	0	0	0	0
J-10	827	41	16	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-10	827	51	26	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-9	827	58	17	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-9	827	59	12	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-9	827	60	17	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-9	827	61	19	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-10	827	65	6	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
J-9	827	66	9	SALV	Y	131	141	9	9	1	0	0	9	0	Y	231	Y	131	141	9	9	1	0	0	9	0	Y	151	0	9	0	0	0	0
K-9	827	67	11	SALV	Y	131	141	11	11	1	0	0	11	0	Y	231	Y	131	141	11	11	1	0	0	11	0	Y	151	0	11	0	0	0	0
K-10	827	68	6	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-9	827	69	14	GREEN	Y	131	141	14	14	2	0	2	14	0	Y	231	Y	131	141	14	14	2	0	2	14	0	Y	151	0	14	0	0	0	0
J-10	827	71	8	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-9	828	12	11	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-9	828	15	17	SALV	Y	0	141	17	17	2	0	17	0	0	N	0	Y	999	0	17	17	1	0	17	0	0	Y	999	17	17	1	17	0	0
K-9	828	17	27	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0

K-10	828	31	12	SALV	Y	0	141	12	12	3	0	12	0	0	N	0	Y	999	0	12	12	2	0	12	0	0	Y	151	12	0	0	0	0	0
K-9	828	33	19	GREEN	Y	131	141	19	19	1	0	1	19	0	Y	231	Y	131	141	19	19	1	0	1	19	0	Y	231	0	0	0	0	0	0
K-9	828	52	14	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	N	0	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-9	828	53	23	GREEN	Y	0	141	23	23	2	0	23	0	0	N	0	N	0	0	0	0	0	0	0	0	0	Y	151	23	0	0	0	0	0
K-10	829	8	19	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-10	829	9	18	GREEN	Y	131	141	18	18	1	0	1	18	0	Y	231	Y	131	141	18	18	1	0	1	18	0	Y	151	18	18	0	0	0	0
K-10	829	10	31	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
K-10	829	24	8	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	Y	151	8	0	0	0	0	0
J-11	830	21	24	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	24	0	0	0	0	0
J-10	830	22	45	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	45	0	0	0	0	0
K-11	830	29	14	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-11	830	43	16	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-10	830	61	13	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	13	13	0	0	0	0
K-11	830	62	4	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	0	4	0	0	0	0
J-10	830	66	13	SALV	Y	131	141	13	13	3	0	13	13	0	Y	231	Y	131	141	13	13	3	0	13	13	0	Y	231	13	13	2	13	0	0
J-11	830	70	9	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	9	0	0	0	0	0
J-11	831	4	18	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	0	18	0	0	0	0
J-11	831	12	34	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	34	34	0	0	0	0
J-11	831	13	16	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-11	831	15	15	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
J-11	831	30	3	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-11	831	37	28	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
J-11	831	40	10	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
J-11	831	42	11	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-11	831	43	9	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-11	831	51	3	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-11	833	3	18	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	18	0	0	0	0	0
J-12	833	23	11	SALV	Y	131	141	8	8	2	0	11	0	0	Y	231	Y	131	141	8	8	2	0	11	0	0	Y	151	0	0	0	0	0	0
J-12	833	37	8	SALV	Y	131	141	8	8	2	0	8	8	0	Y	231	Y	131	141	8	8	2	0	8	8	0	Y	151	0	8	0	0	0	0

J-11	833	43	16	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
J-11	833	57	14	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	14	0	0	0	0	0
J-11	833	70	28	GREEN	Y	0	141	28	28	12	0	28	28	0	N	0	Y	0	141	28	28	12	0	28	28	0	N	0	0	0	0	0	0	0
J-12	833	77	16	SALV	Y	131	141	16	16	4	0	16	24	0	Y	231	Y	131	141	16	16	4	0	16	24	0	Y	231	16	16	2	16	0	0
J-11	833	102	22	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-12	833	116	3	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
J-12	833	120	11	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
I-12	833	122	11	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
J-11	833	132	7	SALV	Y	131	141	0	7	2	0	7	7	0	Y	231	Y	999	0	0	7	1	0	7	7	0	Y	231	7	0	1	7	0	0
K-11	834	19	50	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-11	835	28	12	SALV	Y	131	141	6	9	6	0	6	12	0	Y	231	Y	131	141	6	9	6	0	6	12	0	Y	151	12	12	0	0	0	0
L-12	841	23	16	SALV	Y	131	141	16	8	8	0	16	0	0	Y	231	Y	131	141	16	8	8	0	16	0	0	Y	151	16	16	0	0	0	0
L-12	841	25	13	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
L-12	841	33	15	SALV	Y	131	141	15	15	2	0	6	0	0	Y	231	Y	131	141	15	15	2	0	6	0	0	Y	231	15	15	1	6	0	0
L-12	841	35	14	SALV	Y	131	141	14	14	2	0	14	0	0	Y	231	Y	131	141	14	14	2	0	14	0	0	Y	151	14	14	0	0	0	0
L-12	841	46	12	SALV	Y	131	141	12	12	12	0	12	0	0	Y	231	Y	131	141	12	12	12	0	12	0	0	Y	231	12	12	6	6	0	0
L-12	841	51	6	SALV	Y	131	141	6	3	2	0	6	0	0	Y	231	Y	131	141	6	3	2	0	6	0	0	Y	231	2	6	1	3	0	0
L-12	841	54	4	SALV	Y	131	141	4	4	2	0	4	0	0	Y	231	Y	131	141	4	4	2	0	4	0	0	Y	231	4	4	1	4	0	0
K-12	842	5	11	SALV	Y	131	141	11	11	3	0	11	0	0	Y	231	Y	131	141	11	11	3	0	11	0	0	Y	151	11	0	0	0	0	0
K-12	842	32	16	SALV	Y	0	141	8	16	4	0	8	16	16	Y	231	Y	0	141	8	16	4	0	8	16	16	Y	151	16	16	0	0	0	0
K-12	842	74	10	SALV	Y	0	141	10	10	1	0	2	10	0	Y	231	Y	0	141	10	10	1	0	2	10	0	Y	231	10	10	1	1	0	0
I-12	844	12	29	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
I-12	844	17	7	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
I-12	844	29	16	GREEN	Y	122	132	16	16	2	0	16	0	0	Y	231	Y	122	132	16	16	2	0	16	0	0	Y	151	0	16	0	0	0	0
I-12	844	38	11	SALV	Y	0	141	11	11	3	0	11	11	0	Y	231	Y	0	141	11	11	3	0	11	11	0	Y	151	0	11	0	0	0	0
I-12	844	40	14	SALV	Y	114	0	14	14	14	0	14	14	0	Y	231	Y	114	0	14	14	14	0	14	14	0	Y	151	0	14	0	0	0	0
I-12	844	42	21	SALV	Y	114	0	21	21	21	0	21	21	0	Y	231	Y	114	0	21	21	21	0	21	21	0	Y	231	21	21	10	10	0	0
J-12	844	64	5	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
I-12	844	75	4	SALV	Y	114	0	4	4	4	0	4	4	0	Y	231	Y	114	0	4	4	4	0	4	4	0	Y	151	4	4	0	0	0	0

N-12	852	39	28	GREEN	Y	141	0	0	9	9	3	9	28	28	N	0	Y	141	0	0	9	9	3	9	28	28	N	0	0	0	0	0	0	0
N-12	853	1	28	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
N-13	853	2	37	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
N-12	853	28	19	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
M-13	853	34	23	SALV	Y	0	141	17	17	13	0	13	23	0	N	0	Y	0	141	17	17	13	0	13	23	0	Y	151	17	17	13	13	0	0
N-13	853	40	7	SALV	Y	131	141	0	7	0	0	7	7	0	N	0	Y	131	141	0	7	0	0	7	7	0	Y	999	7	0	0	7	0	0
N-12	853	41	6	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	151	0	0	0	0	0	0
N-12	853	43	8	SALV	Y	131	141	8	8	6	0	8	8	0	Y	231	Y	131	141	8	8	6	0	8	8	0	Y	151	0	8	0	0	0	0
N-13	853	44	17	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
N-13	853	45	19	SALV	Y	131	141	19	19	4	0	19	19	0	Y	231	Y	131	141	19	19	4	0	19	19	0	Y	231	19	19	2	19	0	0
N-13	853	46	14	SALV	Y	131	141	0	14	4	0	14	14	0	N	0	Y	131	141	0	14	4	0	14	14	0	Y	999	14	0	2	14	0	0
N-13	853	47	25	SALV	Y	131	141	25	25	5	0	25	25	0	N	0	Y	131	141	25	25	5	0	25	25	0	Y	999	25	25	3	25	0	0
N-13	853	52	9	SALV	Y	131	141	0	9	5	0	9	9	0	N	0	Y	131	141	0	9	5	0	9	9	0	Y	999	9	0	3	9	0	0
N-13	854	8	28	SALV	Y	0	141	28	7	7	0	7	28	0	N	0	Y	0	141	28	7	7	0	7	28	0	Y	151	7	28	7	7	0	0
N-13	854	10	21	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
N-14	854	13	16	SALV	Y	131	141	16	16	0	0	16	16	0	N	0	Y	131	141	16	16	0	0	16	16	0	Y	999	16	16	0	16	0	0
N-13	854	15	24	SALV	Y	131	141	0	24	5	0	24	24	0	N	0	Y	131	141	0	24	5	0	24	24	0	Y	999	24	0	3	24	0	0
N-13	854	18	11	SALV	Y	131	141	0	11	0	0	11	11	0	Y	231	Y	131	141	0	11	0	0	11	11	0	Y	231	11	0	0	11	0	0
N-13	854	21	2	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
N-13	854	24	11	SALV	Y	131	141	11	11	4	0	11	11	0	N	0	Y	131	141	11	11	4	0	11	11	0	Y	999	11	11	2	11	0	0
N-13	854	26	18	SALV	Y	141	0	0	3	3	0	3	18	0	N	0	Y	141	0	0	3	3	0	3	18	0	N	0	0	0	0	0	0	0
N-13	854	27	6	SALV	Y	131	141	0	6	4	0	6	6	0	N	0	Y	131	141	0	6	4	0	6	6	0	Y	999	6	0	3	6	0	0
N-13	854	28	9	GREEN	Y	999	0	9	9	4	0	4	25	0	N	0	Y	999	0	9	9	4	0	4	25	0	Y	999	9	9	4	4	0	0
N-13	854	33	2	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
N-13	854	35	16	SALV	Y	131	141	0	16	5	0	16	16	0	N	0	Y	131	141	0	16	5	0	16	16	0	Y	999	16	0	3	16	0	0
N-13	854	37	3	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
N-13	854	39	12	SALV	Y	131	141	12	12	4	0	12	12	0	N	0	Y	131	141	12	12	4	0	12	12	0	Y	999	12	12	3	12	0	0
N-13	854	40	20	GREEN	Y	999	0	0	20	0	0	0	20	0	N	0	Y	999	0	0	20	0	0	0	20	0	Y	999	2	0	0	0	0	0
N-13	854	57	15	SALV	Y	0	141	15	15	1	0	1	15	0	N	0	Y	0	141	15	15	1	0	1	15	0	Y	151	15	15	1	1	0	0

N-13	854	59	19	SALV	Y	131	141	19	19	0	0	19	19	0	N	0	Y	131	141	19	19	0	0	19	19	0	Y	999	19	19	0	19	0	0
N-14	854	60	10	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
N-13	854	62	11	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
M-14	865	25	3	SALV	Y	231	0	0	0	0	0	0	0	0	Y	231	Y	231	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
L-14	865	52	22	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
L-14	865	67	19	SALV	Y	131	141	0	19	6	0	6	0	0	Y	231	Y	131	141	0	19	6	0	6	0	0	Y	231	19	0	4	4	0	0
L-14	865	77	3	SALV	Y	231	0	0	2	2	0	2	0	0	Y	231	Y	231	0	0	2	2	0	2	0	0	Y	231	0	0	0	0	0	0
M-14	866	2	13	SALV	Y	0	141	13	13	0	0	0	0	0	Y	231	Y	999	0	13	13	0	0	0	0	0	Y	231	13	13	0	0	0	0
M-14	866	6	19	SALV	Y	0	141	19	19	0	0	0	0	0	N	0	Y	0	141	19	19	0	0	0	0	0	Y	999	19	19	0	0	0	0
M-14	866	12	19	SALV	Y	0	141	19	19	10	0	10	0	0	Y	231	Y	0	141	19	19	10	0	10	0	0	Y	231	19	19	5	5	0	0
M-14	866	31	27	SALV	Y	0	141	27	27	0	0	27	0	0	N	0	Y	0	141	27	27	0	0	27	0	0	Y	151	27	27	0	0	0	0
M-14	866	44	2	SALV	Y	132	0	2	2	1	0	1	0	0	Y	231	Y	999	0	2	2	1	0	1	0	0	Y	231	2	2	0	0	0	0
M-14	866	45	22	SALV	Y	0	141	22	22	9	0	9	0	0	Y	231	Y	0	141	22	22	9	0	9	0	0	Y	999	22	22	5	5	0	0
N-14	868	5	21	SALV	Y	131	141	21	21	0	0	21	21	0	Y	231	Y	131	141	21	21	0	0	21	21	0	Y	231	21	21	0	21	0	0
N-14	868	13	6	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
M-14	868	14	17	SALV	Y	131	141	17	17	0	0	17	17	0	N	0	Y	131	141	17	17	0	0	17	17	0	Y	999	17	17	0	17	0	0
M-14	868	16	8	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
N-14	868	20	6	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
N-14	868	27	20	SALV	Y	131	141	20	20	0	0	20	20	0	N	0	Y	131	141	20	20	0	0	20	20	0	Y	999	20	20	0	20	0	0
N-14	868	28	8	SALV	Y	131	141	8	8	0	0	8	8	0	N	0	Y	131	141	8	8	0	0	8	8	0	Y	999	8	8	0	8	0	0
N-13	869	1	10	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	N	0	0	0	0	0	0	0	0	0	Y	151	10	10	0	0	0	0
N-14	869	5	19	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
N-14	869	8	6	SALV	Y	131	141	6	6	1	0	6	6	0	Y	231	Y	131	141	6	6	1	0	6	6	0	Y	231	6	6	1	6	0	0
N-14	869	9	9	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
N-14	869	11	11	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
N-14	869	13	20	SALV	Y	131	141	20	20	4	0	20	20	0	Y	231	Y	131	141	20	20	4	0	20	20	0	Y	231	20	20	2	20	0	0
N-13	869	20	12	SALV	Y	131	141	12	12	4	0	12	12	0	N	0	Y	999	0	12	12	4	0	12	12	0	Y	999	12	12	2	12	0	0
N-13	869	21	12	SALV	Y	131	141	12	12	3	0	12	12	0	N	0	Y	131	141	12	12	3	0	12	12	0	Y	999	12	12	2	12	0	0
N-14	869	25	10	SALV	Y	232	0	0	0	0	0	0	0	0	N	0	Y	232	0	0	0	0	0	0	0	0	Y	151	0	10	0	0	0	0

M-15	870	4	20	SALV	Y	0	141	20	20	5	0	20	20	0	Y	231	Y	0	141	20	20	5	0	20	20	0	Y	151	20	20	0	0	0	0
M-15	870	8	36	SALV	Y	0	141	36	36	12	0	36	36	0	Y	231	Y	0	141	36	36	12	0	36	36	0	Y	231	36	36	5	5	0	0
M-15	870	76	11	SALV	Y	0	141	3	11	3	0	3	3	0	N	0	Y	0	141	3	11	3	0	3	3	0	Y	999	11	4	2	2	0	0
M-15	870	80	8	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
M-15	871	6	5	SALV	Y	131	141	5	5	0	0	0	0	0	Y	231	Y	131	141	5	5	0	0	0	0	0	Y	231	5	5	0	0	0	0
M-15	871	8	13	SALV	Y	132	0	13	13	0	0	0	0	0	Y	231	Y	132	0	13	13	0	0	0	0	0	Y	231	13	13	0	0	0	0
M-15	871	12	9	SALV	Y	0	999	9	9	4	0	4	0	9	N	0	Y	0	999	9	9	4	0	4	0	9	N	999	9	9	2	2	0	9
M-15	871	17	14	SALV	Y	131	141	0	14	3	0	3	0	0	Y	231	Y	999	0	0	14	3	0	3	0	0	Y	151	14	0	0	0	0	0
M-15	871	18	14	SALV	Y	131	141	0	14	5	0	14	0	0	Y	231	Y	131	141	0	14	5	0	14	0	0	Y	231	14	0	3	14	0	0
L-15	871	21	8	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
M-15	871	45	6	SALV	Y	131	141	6	6	2	0	2	0	0	Y	231	Y	131	141	6	6	2	0	2	0	0	Y	231	6	6	1	1	0	0
M-15	871	46	21	SALV	Y	131	141	21	21	0	0	0	0	21	Y	231	Y	131	141	21	21	0	0	0	0	21	Y	231	21	21	0	0	0	21
L-15	871	51	18	SALV	Y	131	141	0	18	5	0	5	0	0	Y	231	Y	131	141	0	18	5	0	5	0	0	Y	999	18	18	0	0	0	0
M-15	871	63	13	SALV	Y	132	0	0	13	4	0	4	0	0	Y	231	Y	132	0	0	13	4	0	4	0	0	Y	231	13	0	2	2	0	0
L-15	871	65	14	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
M-15	871	66	42	SALV	Y	131	141	0	42	42	0	42	0	0	Y	231	Y	131	141	0	42	42	0	42	0	0	Y	231	42	0	21	21	0	0
M-15	871	68	4	SALV	Y	131	141	0	4	2	0	4	0	0	Y	231	Y	131	141	0	4	2	0	4	0	0	Y	231	4	0	1	4	0	0
L-15	871	88	12	SALV	Y	131	141	12	12	3	0	3	0	0	Y	231	Y	131	141	12	12	3	0	3	0	0	Y	231	12	12	2	2	0	0
L-15	871	92	9	SALV	Y	132	0	9	9	4	0	4	0	0	Y	231	Y	132	0	9	9	4	0	4	0	0	Y	231	9	9	2	2	0	0
L-15	871	96	10	SALV	Y	132	0	10	10	3	0	3	0	0	Y	231	Y	132	0	10	10	3	0	3	0	0	Y	231	10	10	2	2	0	0
L-15	871	101	16	SALV	Y	131	141	0	16	10	0	16	0	0	Y	231	Y	131	141	0	16	10	0	16	0	0	Y	231	16	0	5	16	0	0
L-15	871	106	6	SALV	Y	131	141	6	6	2	0	2	0	0	Y	231	Y	131	141	6	6	2	0	2	0	0	Y	999	6	6	0	0	0	0
L-15	872	15	17	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
L-15	872	18	22	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-14	873	3	15	SALV	Y	0	141	14	14	0	0	14	0	14	Y	231	Y	0	141	14	14	0	0	14	0	14	Y	151	14	14	0	0	0	0
K-14	873	22	63	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
K-15	873	24	22	SALV	Y	232	0	0	0	0	0	0	0	0	Y	231	Y	232	0	0	0	0	0	0	0	0	Y	231	0	0	0	0	0	0
L-15	882	10	12	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
L-15	882	11	22	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0

L-15	882	12	8	SALV	Y	131	141	8	8	0	0	0	0	0	Y	231	Y	131	141	8	8	0	0	0	0	0	Y	231	8	8	0	0	0	0
L-15	882	19	23	SALV	Y	132	0	23	23	5	0	5	0	0	Y	231	Y	132	0	23	23	5	0	5	0	0	Y	231	23	23	3	3	0	0
L-15	882	21	15	SALV	Y	131	141	15	15	5	0	5	0	0	Y	231	Y	131	141	15	15	5	0	5	0	0	Y	231	15	15	3	3	0	0
L-15	882	36	16	SALV	Y	131	141	0	16	0	0	0	0	0	Y	231	Y	131	141	0	16	0	0	0	0	0	Y	231	16	0	0	0	0	0
L-15	882	80	31	GREEN	Y	220	0	0	0	0	0	0	0	0	N	0	Y	220	0	0	0	0	0	0	0	0	N	0	0	0	0	0	0	0
L-15	882	89	8	GREEN	Y	131	141	0	8	4	0	4	8	0	N	0	Y	131	141	0	8	4	0	4	8	0	N	0	0	0	0	0	0	0
L-16	882	91	11	GREEN	Y	131	141	0	11	5	0	5	11	0	N	0	Y	131	141	0	11	5	0	5	11	0	N	0	0	0	0	0	0	0

EAST SIDE OUTCOME DATA

The environmental consequences for each alternative have been evaluated by describing how the stand characteristics provided for the present condition have been changed based upon the type of treatment (or lack of treatment) that is applied. This provides a quantitative means of summarizing the differences in direct and indirect effects between alternatives and serves as a basis for making qualitative judgment regarding future outcomes of various treatment strategies.

A 20-year time span was considered in assigning outcomes. This allows adequate time for the completion of all harvest or reforestation activities initiated in East Side, as well as response from vegetation affected by those activities to be evaluated. Estimates of the outcome condition of vegetation are based upon professional judgment. Knowledge gained from monitoring and evaluation of on-going silvicultural applications is the basis for the assignment of many outcome conditions.

Outcomes are displayed for each alternative for every stand. Outcomes for Alternative 5 are the same as those calculated for Alternative 2 and are presented in the same columns as Alternative 2. The present condition data displayed in Table 22 and the treatments applied in each alternative (Table 23) have been evaluated to determine what condition will develop in 20 years. Table 24 displays the outcome data for each stand determined by considering the vegetation behavior guidelines outlined below. A more complete description of the guidelines used can be found in the project file.

The outcome data is the basis for many of the tables included in Chapter 3 of the FEIS. More detail on outputs is available in the project file.

Outcome Table Definitions

PStocking – Projected stocking defines the relative density or seedling/sapling stocking of the stand 20 years from now, well beyond the time when all of the harvesting and reforestation activities are complete. It also provides approximately 13-18 years for tree growth following harvest treatments.

In stands where thinning, two-aged and uneven-aged harvests occur, projected stocking is determined by estimating the amount of loss due to harvest plus growth that would occur in the residual stand over the next 20 years. The value is expressed as relative stand density. First, we estimated the post harvest relative density by considering the present condition stocking and the kind of harvest prescribed. Then we estimated the increase in relative density that would occur as a result of growth. Growth is estimated to add 5% relative density to stands whose post-harvest density is less than 40% stocked; 15% relative density to stands whose post-harvest density is between 40% and 95% stocked; and 5% to stands whose post-harvest density is greater than 95% stocked.

In stands where even-aged regeneration harvests occur, projected stocking represents the percent of plots that are adequately stocked following the harvest and application of reforestation treatments. The outcome depends on the type and timing of the harvest, the treatment objective (whether green, salvage or wildlife), the adequacy of current seedlings, and in some cases, the black cherry or birch basal area in the present stand. In 20 years, the stocking in these stands would still be measured based upon seedling/sapling-sized vegetation.

PStocking Class – Stands are assigned to a Pstocking class based upon the following thresholds:

PStocking Class	Stocking Range
0	0-15%
1	16-40%
2	41-59%
3	60-79%
4	$\geq$ 80%

Year of Origin – Year of origin remains unchanged from the present condition except when even-aged regeneration harvests are applied or when wildlife openings are created. Therefore, the year of origin remains the same for thinning, two-age and uneven-aged treatments.

Generally, when stands are managed under uneven-aged management, a year of origin is not assigned due to the multiple age classes found within the stand. Stands receiving an uneven-aged treatment in this project are currently even-aged stands. Post-harvest, the current overstory will still dominate the site, supplemented at most by one additional age class of seedlings that develop from currently proposed treatments. Therefore, we have elected to assign them their current age for the next 20 year time period. Stands treated with two-age harvests will also have a second age class in place, however we have also elected to retain the existing year of origin for the next 20 years for these stands.

Year of origin for even-aged regeneration harvests is determined by the year that the final harvest cut occurs. In stands where adequate regeneration presently exists, and the removal cuts are scheduled for the first entry, the new year of origin is estimated to be 2001. In stands where adequate seedlings do not currently exist, and some combination of harvest and reforestation activities are prescribed, the new year of origin is estimated to be 2008.

Stands receiving a wildlife treatment (creating a wildlife opening) have no year of origin assigned.

PAge Class – For summary purposes, stands have been assigned to projected age classes. Projected age classes are used in the discussions related to effects of alternatives. Projected age class assignments are based on the year 2019 (20 years from when the analysis was prepared).

Code	PAge Class Description	Included Years of Origin
0	None	N/A
1	0 – 10 years	2009 – 2019
2	11 – 20 years	1999 - 2008
5	21 – 50 years	1969 - 1998
11	51 – 110 years	1909 - 1968
12	111 + years	< 1909

PForest Type – Projected forest types are assigned based on the tree species composition expected to occur within the stand in 20 years. Current dead/declining trees are not considered. Only overstory trees are considered in stands receiving thinning, two-aged and uneven-aged harvests. Tree seedlings/saplings are considered in stands receiving even-aged regeneration harvests.

For thinning, two-aged, and uneven-aged harvests, the original forest type would be retained, unless information on risk trees (trees that are declining and are not expected to survive the next 20 years) shows that a shift in composition occurs. If sufficient shift in composition occurs, a new forest type was assigned.

In stands where even-aged regeneration harvests occur, estimates of projected forest types were based on current seedling composition, types of harvest and reforestation treatments applied, and current overstory basal area of black cherry and/or birch.

PBeech/Striped Maple Class – Projected levels of understory beech and striped maple were estimated by considering the present condition and the combination of treatments prescribed. General assumption is that levels of beech and striped maple will either remain constant or increase one class from the present condition unless reforestation treatments include treating the stand with an herbicide or by site preparation to remove beech and striped maple. Levels are estimated to remain constant if there is no beech/striped maple now, if the site is presently fully occupied by fern or grass or if overstory relative density remains $\geq$80% stocked. Levels are estimated to increase by one class if overstory stocking levels drop below

80%. Levels of beech and striped maple are set at 1 where herbicide treatment or site preparation to remove beech and striped maple occur in combination with a regeneration harvest.

PFern/Grass Class – Projected levels of fern and grass ground cover were estimated by considering the present condition and the combination of treatments prescribed. General assumption is that fern and grass will be found in 20 years in the understory of all Eastside stands, regardless of whether or not herbicides are applied. Also, it is projected that fern and grass will increase over time when herbicides are not applied. When herbicides are applied it is expected that fern and grass will be removed long enough for seedlings to germinate and develop, and that a reduced amount of fern and grass will re-invade the area after seedlings are established.

PTotal Interference Class – This is a measure of the combined level of interference from fern/grass and beech/striped maple. If either projected beech/striped maple class or projected fern/grass class is $\geq$2, then Ptotal interference is given a 'Y', if neither is $\geq$2, then Ptotal interference is given an 'N'.

PRegen Class – Projected levels of regeneration in 20 years were estimated by considering the present regen class, the type of harvest, the use of reforestation treatments and the current overstory basal area of black cherry and/or birch. In order for regeneration to increase, understory interference must be low enough for seedlings to germinate and develop AND overstory stocking levels must be low enough for adequate light to reach the forest floor. If these conditions do not result from treatments included in an alternative, it is estimated that Pregen class does not change. When regeneration harvests and reforestation treatments are prescribed, it is estimated that seedling development will occur.

PBirch Class – Projected birch class is the amount of birch regeneration that is expected to develop in the next 20 years. For thinnings, projected birch class is determined by whether or not birch is present now, or whether or not birch basal area is currently found in the stand. For regeneration treatments (even-aged regeneration, two-aged, and uneven-aged harvests), it is projected that release treatments will be scheduled to control the development of birch.

PMid-story? – Projected mid-story is the amount of vegetation between 5 and 30 feet tall that is expected to develop in the next 20 years. In all stands, if either projected regen, projected birch or projected beech/striped maple classes are $\geq$ 2, then projected midstory = 'Y'

40 Ac Bl – Forty Acre Block ID - The number in this column refers to the Block ID found on Table 19. If the entry is blank, then the stand does not result in a temporary opening greater than 40 acres in size.

Herb Bl – Herbicide Block ID – This column refers to the herbicide block ID found on Table 20. If the entry is blank, then the stand does not result in an herbicide block greater than 40 acres in size.

Table 24. East Side Outcome Table

(Due to data size, Table 24 may be viewed in Appendix B_Table 24.pdf)

Changes in treatments between draft and final eis Documents

There are sixteen stands where changes in treatment from the draft EIS to the final EIS have occurred. Thirteen stands were included in an errata sheet that was distributed with the draft EIS; three additional changes have been made. All changes occur in MA 3.0. Table 25 displays the old and new treatments for each stand for each alternative. Data on the bottom of this table reflects the treatments that are included in the proposed action in Chapter 2 of the FEIS.

Changes have been made based upon recent field reviews and have been needed for one of the following reasons: 1. The reason for treatment (i.e., whether the treatment is a salvage or green objective) has been re-evaluated; 2. The treatment was dropped due to spatial considerations; 3. The treatment was dropped because delay in implementing treatments has caused harvest volume to deteriorate. Operable sale opportunity no longer exists; and 4. Stand acres were incorrectly reported on original data sheets. Table 26 displays the changes by harvest activity for each alternative.

In total, modifications to prescriptions result in minor shifts in total amount of harvest proposed. To some extent, treatments are offsetting. There are decreases in green harvest prescriptions that are partially offset by increases in salvage harvest (as a result of changing the treatment objective). The change in treatments results in less than 2% change from what was originally proposed, and results in less total treatment in all alternatives.

Modification in regeneration harvest activity results in changes to the amount of reforestation activity needed. Table 27 displays the changes by reforestation activity for each alternative. In total, modifications to amounts of reforestation activity are minor. Decreases of 2.6% or less occur in all instances.

The primary difference as a result of modification to prescriptions is that fewer acres of regeneration harvest and associated reforestation activities occur. Overall, this represents extremely minor changes in age class distribution from what was displayed in the DEIS, as well as extremely minor changes in seedling production.

Discussion of effects in the FEIS will not be changed to reflect changes in prescription. Information as was displayed in the DEIS is sufficient for the Deciding Officer to determine differences in effect by alternative as comparable degrees of change occur from one alternative to another.

Table 28 displays the present condition data that was considered in the analysis for the DEIS for the stands where treatments have changed and the present condition data that now exists. The data at the bottom of the table replaces the individual stand data included in Table 22.

Table 29 displays the outcome data for the stands where treatments have changed. The top of the table displays the outcomes included in the DEIS on Table 23. The bottom of the table displays the new outcomes that result from the change of treatments included in Chapter 2 of the FEIS.

Table 25. Changes in Treatments Between Draft and Final EIS

Due to data size, Table 25 can be seen in Appendix B_Table 25.pdf

Table 26. Change in Harvest Activity by Alternative

Activity	Alt 1	Alt 2	Alt 3	Alt 4
EVEN-AGED REGENERATION HARVESTS				
Green				
Clearcut (includes 18 ac. wildlife openings)	0	0	0	0
Shelterwood seed cut (1st entry)/Removal cut (2nd entry)	-76	0	-76	0
Shelterwood removal cut	-43	0	-43	0
Shelterwood removal cut (delay)	-2	0	-2	0
Prep cut / Two-aged	-25	0	-8	0
Reforestation treatments only	0	0	0	0
Salvage				
Clear-cut	0	0	0	0
Shelterwood seed cut (1st entry)/Removal cut (2nd entry)	+25	0	+25	0
Shelterwood removal cut	+16	0	+16	0
Shelterwood removal cut (delayed)	-9	0	-9	0
Prep cut /Two-aged	-15	0	-15	0
Two-aged	0	0	0	0
Reforestation treatments only	+9	0	+9	+9
INTERMEDIATE TREATMENTS				
Green				
Commercial Thinning	+2	0	+2	0
Salvage				
Salvage Thinning	+12	-56	-5	-17
UNEVEN-AGED				
Green				
Selection	0	0	0	-35
Group Selection	0	0	0	0
Transition Cut	0	0	0	0
Salvage				
Selection	0	0	0	-5
Group Selection	0	0	0	0
Total	**-106**	**-56**	**-106**	**-48**
% of Original Alternative Total	**1.3%**	**1.3%**	**1.8%**	**0.8%**

Table 27. Change in Reforestation Activity by Alternative

Alternative	Herbicide	Site Prep	Fertilize	Fence	Plant	TSI/ Release
1	-88 (2.5%)	-79 (2.5%)	-29 (2.2%)	-52 (2.2%)	-18 (2.2%)	0

2	0	0	0	0	0	0
3	-71 (2.4%)	-62 (2.4%)	-29 (2.6)	-35 (1.8)	-9 (1.2%)	0
4	-35 (1.2%)	-11 (0.4%)	0	0	0	0

Table 28. Change in Present Condition Data for Stands Where Treatments Change Between DEIS and FEIS

(Due to Data Size, Table 28 may be viewed at Appendix B_28.pdf

Table 29. Change in Outcomes for Stands Where Treatments Change Between DEIS and FEIS

Due to data size, Table 29 may be viewed in Appendix B_Table 29.pdf

REFERENCES

deCalesta, D.S. 1994. Effect of White-tailed Deer on Songbirds within Managed Forests in Pennsylvania. J. Wildl. Manage. 58: 711-718.

Drohan, Patrick, Stout, S., G. Peterson. 1999. Spatial relationships between sugar maple (*Acer saccharum* Marsh), sugar maple decline, slope, aspect, and atmospheric deposition in Pennsylvania. In Horsley, Steven B.; Long, Robert P. Sugar Maple Ecology and Health: Proceedings of an International Symposium. Warren, PA: June 2-4, 1998. Radnor, PA: USDA-Forest Service, Northeastern Research Station, Gen. Tech. Rep. NE-261: 46-50

Horsley, Stephen B., Robert P. Long. 1999. Sugar maple ecology and health: proceedings of an international symposium. U. S. Dept. of Ag., Forest Service, Northeastern Research Station. Radnor, PA. Gen. Tech. Rep. NE-261.

Horsley, Stephen B., Robert P. Long, Scott W. Bailey, Richard A. Hallett, Thomas J. Hall. In press. Factors associated with the decline-disease of sugar maple on the Allegheny Plateau. Canadian Journal of Forest Research 30.

Jones, S.B., deCalesta, D. and S.E. Chunko. 1993. Whitetails are Changing our Woodlands. Amer. For. Nov./Dec.: 20-25, 53-54.

Likens, G.E., C.T. Driscoll, D.C. Buso, T.G. Siccama, C.E. Johnson, G.M. Lovett, T.J. Fahey, W.A. Reiners, D.F. Ryan, C.W. Martin, S.W. Bailey. 1998. The biogeochemistry of calcium at Hubbard Brook. Biogeochemistry 41: 89-173.

Lynch, J.A., J.W. Grimm, K.S. Horner. 1998. Atmospheric deposition: spatial and temporal variations in Pennsylvania - 1997. University Park, PA: Environmental Resources Research Institute Publication ER9811.

Marquis, D.A. 1975. The Allegheny Hardwood Forests of Pennsylvania: Their Bounty of Timber and Deer are the Results of Events that Occurred Many Years Ago. USDA Forest Service General Technical Report NE-15. 32 pp.

Marquis, D.A. 1994a. History and Origin of Allegheny Forests. *in* Quantitative Silviculture for Hardwood Forests of the Alleghenies. pp. 5-40 USDA Forest Service, Northern Forest Experiment Station. General Technical Report NE-183.

Marquis, D.A. ed. 1994b. Quantitative Silviculture for Hardwood Forests of the Alleghenies. Gen. Tech. Rep. NE-183. Radnor, PA: USDA Forest Service, NE Forest Experiment Station. 376 pp.

Marquis, D.A., R. L. Ernst, S.L. Stout. 1992. Prescribing Silvicultural Treatments in Hardwood Stands of the Allegheny (Revised). Gen. Tech. Rep. NE-96. Radnor, PA: USDA-Forest Service. Northeastern Forest Experiment Station. 101 pp.

Marquis, D.A. and R.L. Johnson. 1989. Silviculture of Eastern hardwoods. *In* The Scientific Basis for Silviculture and Management Decisions in the National Forest System. *Edited by* Russel M. Burns. Usda For. Serv. Gen Tech. Rep. WO-55. pp. 9-17.

McWilliams, W.H., R.L. White, S.L. Arner, C.A. Nowak, S.L. Stout. 1996. Characteristics of Declining Forest Stands on the Allegheny National Forest. Gen. Tech. Rep. NE-360. Radnor, PA: USDA-Forest Service. Northeastern Forest Experiment Station. 9 pp.

McWilliams, William H. 1999, June. Written correspondence to John E. Palmer, Forest Supervisor, Allegheny National Forest.

NOAA. 1995. Climatological data. National Oceanic and Atmospheric Administration, Environmental Data and Information Service, National Climatic Center, Asheville, NC.

Redding, J. 1995. History of Deer Population Trends and Forest Cutting on the Allegheny National Forest. *In* Proceedings of the 10th Central Hardwood Conference. *Edited by* K.W. Gottschalk and S.L.C. Fosbroke. USDA For. Srev. Gen. Tech. Rep. NE-197. pp. 214-224.

Tilghman, N.G. 1989. Impacts of the white-tailed Deer on Forest Regeneratoin in Northwestern Pennsylvania. J. Wildl. Manage. 53: 524-532.

Whitney, G.G. 1990. The History and Status of the Hemlock Forest on the Allegheny Plateau. J. Ecol. 78: 443-458.

USDA-FS. 1985. A Twenty-year History of Forest Insect and Disease Management on the Allegheny National Forest, Pennsylvania, 1965-1985. Forest Pest Mgmt., USDA-FS, Morgantown, W.Va. 19 pp.

USDA-FS. 1986. Allegheny National Forest Final Environmental Impact Statement Land and Resource Management Plan (FEIS), Warren, PA

USDA-FS. 1995a. Analysis of Timber Harvest Program Capability. Allegheny National Forest. Warren, PA.

USDA-FS. 1995b. Environmental Assessment of Tree Mortality and Ecosystem Sustainability on the Allegheny National Forest. Warren PA. 70 pp.

USDA-FS. 1997a. Allegheny National Forest Annual Monitoring Report for Fiscal Year 1996. Warren, PA.

USDA-FS. 1997b. Allegheny National Forest Compartment Prescription Handbook, draft.

USDA-FS. 1998. Allegheny National Forest Monitoring and Evaluation Report - Fiscal Year 1997. Warren, PA. 91 pp.

Index

A

Adaptive Management 16, 35
Age Class 9-10, 12, 35-36, 52, 76
Allegheny Hardwood 11, 14-15, 25
Alternative (s)…..……2, 16-22, 36, 38
Alternative 1..... 17, 20, 22, 37
Alternative 2..... 17, 37-38, 51
Alternative 3..... 20, 37
Alternative 4..... 16, 19, 22, 37
Alternative 5..... 37, 51

B

Basal Area 5-6, 15, 23-24, 51-53
Biological Assessment 16
Browsing 1, 2, 4, 13, 35, 36, 39

C

Canopy 12, 35
Certification of Regeneration in Final Harvest Areas 3
Clearcut 18, 39, 79
Commercial Thinning 79
Composition 1-3, 5, 10, 36, 37, 52

D

Dead And Dying Trees 6, 9, 35-37
Decline 4-9, 12, 24, 35, 83
Deer 1, 2, 4, 13, 15, 19, 35, 36, 39
Defoliation 1, 5
Desired Future Condition 8
Drought 1, 4, 24

E

Early Successional 15
Even-Aged Final Harvest 3
Even-Aged Management .. 10, 15, 16, 19, 36
Even-Aged Regeneration Harvests ... 20, 51, 52

F

Fencing 3
Fertilization 3, 36, 39
FOREST PLAN 2, 8
Forest Type 11, 15, 16, 23, 24

G

Glyphosate 38
Group Selection 17, 18, 79
Group Selection Cutting 18

H

Harvest . 15, 17-18, 20-22, 24, 35-38, 51-53, 76
Harvest Treatments 3
Harvesting 1-3, 8, 51
Healthy Trees 18, 23, 24, 35-37
Herbicide 2, 3, 22, 36, 38, 53, 79

I

Individual Tree Selection 17, 18
Interfering Plants 20
Intermediate Harvests 18
Intermediate Thinning 3, 18, 38

L

Landscape 3, 9
Logging 1

M

Management Area (s) 15
Mature Forest 4, 8
Midstory 9, 22, 24, 25, 53
Mitigation 10
Monitoring 4, 84
Mortality 4, 5, 7, 8, 9, 12, 20, 35, 84

N

Natural Regeneration 3, 36, 38
Non-Commercial Cutting 39
Northeastern Research Station 83
Northern Hardwood (s) … 10-12, 14-16, 24-25

P

Planting 2, 36, 38
Prep Cut /Two-Aged 79
Pruning 3

R

Reforestation 3, 18, 37, 79
Reforestation Activities 36-38, 51, 52, 76
Reforestation Treatments ... 9, 17, 37, 38, 51-53
Reforestation Treatments Only 79
Regenerate 3
Regeneration 2, 6, 7, 9, 15, 18, 20, 22-26, 35-37, 51-53, 76
Regeneration Harvests 22, 79
Relative Density 2, 12, 13, 18
Release 3, 36, 39, 79
Research Natural Area 10
Riparian 14, 15, 17, 18, 19, 26, 37
Riparian Zones 18
Risk 5, 6, 18, 52

S

Salvage 3, 18, 21, 38, 79
Salvage Thinning 35, 36, 79
Sawtimber 2
Second Growth 2
Seeding 3
Selection 79
Shade-Tolerant 15
Shade-Tolerant Species 15
Shelterwood Removal Cut 18, 39, 79
Shelterwood Removal Cut (Delay) 79
Shelterwood Seed Cut 18, 79
Site Preparation 3
Slash 1
Soils 19
Standards And Guidelines 22

T

Temporary Openings 9, 20, 22
Thinning 10, 18, 23, 35, 37, 51, 52, 53
Transition Cut (ing) 18, 79
Treatment Area (s) 12-15, 22
Two-Age 18
Two-Age Prep 18
Two-Aged 18, 51, 52, 53, 79

U

UEAM 15-17, 19, 20
Understory ... 1, 5, 7, 9, 10, 13-15, 22, 24, 36, 37, 52
Uneven-Aged……8, 9, 10, 15-17, 19, 22, 26, 35, 36, 51-53, 79
Uneven-Aged Management 15-17, 19

V

Visually Sensitive 15, 17-19

W

Wet Soil 17-19
Wildlife . 2-4, 8, 9, 10, 18, 23, 35, 38, 51, 52, 79

Embedded Secure Document

The file *http://www.fs.fed.us/r9/allegheny/forest_management/projects/eastside/Appendix%20B_Table%2024.PDF* is a secure document that has been embedded in this document. Double click the pushpin to view.

Embedded Secure Document

The file *http://www.fs.fed.us/r9/allegheny/forest_management/projects/eastside/Appendix%20B_Table%2025.PDF* is a secure document that has been embedded in this document. Double click the pushpin to view.

Embedded Secure Document

The file *http://www.fs.fed.us/r9/allegheny/forest_management/projects/eastside/Appendix%20B_Table%2028.pdf* is a secure document that has been embedded in this document. Double click the pushpin to view.

Embedded Secure Document

The file *http://www.fs.fed.us/r9/allegheny/forest_management/projects/eastside/Appendix%20B_Table%2029.PDF* is a secure document that has been embedded in this document. Double click the pushpin to view.

APPENDIX C

Biological Assessment for
East Side Environmental Impact Statement
Allegheny National Forest

- and -

East Side Project
Wildlife Report/Treatments

Biological Assessment for
East Side Environmental Impact Statement
Allegheny National Forest

December 2000

TABLE OF CONTENTS

Page

INTRODUCTION 1
SPECIES STATUS 1
LIFE HISTORY 2
Timber Rattlesnake 2
Bald Eagle 2
Yellow-bellied Flycatcher 4
Indiana Bat 4
Northern Long-eared Bat 11
Northern Water Shrew 11
Clubshell Mussel and Northern Riffleshell Mussel 12
Green-faced Clubtail 12
Long-solid Mussel 12
Harpoon Clubtail 13
Rapids Clubtail 13
Mustached Clubtail 13
Midland Clubtail 13
Ski-tailed Emerald 13
Uhler's Sundragon 14
Maine Snaketail 14
Zebra Clubtail 14
Small Whorled Pogonia 14
Weigand's Sedge 14
Butternut 15
Creeping Snowberry 15
Thread Rush 15
Rough Cotton-grass 15
Spotted Darter 15
Tippecanoe Darter 16
Longhead Darter 16
Mountain Brook Lamprey 16
Gravel Chub 16

Channel Darter 16
Gilt Darter 16
DESCRIPTION OF ALTERNATIVES 17
Alternative 1 (Proposed Action) 17
Alternative 2 20
Alternative 3 23
Alternative 4 26
Alternative 5: No New Federal Action 30
POTENTIAL IMPACTS TO PETS SPECIES 30
CUMULATIVE EFFECTS 40
SUMMARY OF DETERMINATIONS 42
LITERATURE CITED 44
EAST SIDE WILDLIFE REPORT AND TREATMENTS 49
INDEX 59

LIST OF TABLES

Page

Table 1. Federally Proposed, Threatened, Endangered, and Regionally Sensitive Species for the ANF 1
Table 2. Bald Eagle Nesting Status for the ANF 3
Table 3: Comparison of Indiana Bat Dead Tree Habitat Requirements with existing Conditions for the East Side Project Area 9
Table 4: Comparison of Indiana Bat Live Tree Habitat Requirements with existing Conditions for the East Side Project Area 10
Table 5. Alternative 1 - Vegetation Treatments (acres) 19
Table 6. Alternative 1 - Proposed Transportation System Activities 20
Table 7. Alternative 1 - Wildlife Treatments 20
Table 8. Alternative 2 - Vegetation Treatments (acres) 22
Table 9. Alternative 2 - Proposed Transportation System Activities 22
Table 10. Alternative 3 - Vegetation Treatments (acres) 25
Table 11. Alternative 3 - Proposed Transportation System Activities 26
Table 12. Alternative 3 - Wildlife Treatments 26
Table 13. Alternative 4 - Vegetation Treatments (acres) 29
Table 14. Alternative 4 - Proposed Transportation System Activities 29
Table 15. Alternative 4 - Wildlife Treatments 30

Table 16. Alternative Treatment Area Indiana Bat Roost Habitat Outcomes (Acres in Year 2019) 35
Table 17. Alternative Treatment Area Indiana Bat Forage Habitat Outcomes (Acres in Year 2019) 36
Table 18. Miles of Road and Stream Crossings within 300 feet of a Stream by Alternative. 37
Table 19. Miles Of Road Within 300 Feet Of A Stream That Would Be Obliterated By Alternative 38
Table 20. East Side Project Area Cumulative Totals by Treatment 41
Table 21. Age Class Distribution for ANF Land within the Project Area - Projected to 2019 (as a percent of the 139,990 acres of ANF land) 41
Table 22. Wildlife Habitat Communities 50
Table 23. Wildlife Treatments by Alternative (In Acres) MA 3.0 51
Table 24. Wildlife Treatments by Alternative (In Acres) MA 2.0 51
Table 25. Wildlife Treatments by Alternative (In Acres) MA 6.1 51
Table 26. Wildlife Project Proposals 52

INTRODUCTION

This Biological Assessment includes a brief description of the habitat for federally proposed, endangered, and threatened species and regionally sensitive species followed by an analysis of potential impacts associated with each alternative being considered in the East Side Environmental Impact Statement.

The analysis presented in the Biological Assessment for Threatened and Endangered Species on the Allegheny National Forest (December 1998) is not repeated in this biological assessment; however, it is incorporated by reference along with Fish and Wildlife Service's Biological Opinion (June 1999).

SPECIES STATUS

Federally proposed, threatened, and endangered species, and Regional Forester sensitive species are addressed in this biological assessment.

The following is a description of the species status used in Table 1.

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 1. Federally Proposed, Threatened, Endangered, and Regionally Sensitive Species for the ANF

Species	SpeciesStatus
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 (G*omphus 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

Species	SpeciesStatus
Plants	
Small whorled pogonia (*Isotria medeoloides*)	Threatened
Wiegand's 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.

LIFE HISTORY

A brief description of the habitat for each species is included below with some description of the behavior (eg. foraging, breeding, roosting, etc.) associated with the habitat. For the Bald eagle, Indiana bat, Clubshell mussel, Northern riffleshell mussel, and Small whorled pogonia a detailed habitat description can be found in the Biological Assessment for Threatened and Endangered Species on the Allegheny National Forest (December 1998).

TIMBER RATTLESNAKE

The timber rattlesnake inhabits wooded hillsides with rock outcrops where rodents are often abundant. Rock outcrops provide summer basking sites as well as fissures which allow rattlesnakes to reach winter dens deep in the ground below frost line. Slopes with a southern exposure are preferred. Rattlesnakes usually return to the same den each winter (Shaffer, 1991). Maintaining the integrity of these den sites is the primary habitat management action for sustaining rattlesnake populations on the ANF.

BALD EAGLE

On July 12, 1995, the USDI Fish and Wildlife Service (FWS) 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 FWS proposed de-listing the Bald eagle.

The FWS has divided the lower 48 states into 5 recovery regions. Northwest 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. Two of these nests are located within the ANF proclamation boundary on the side hills of the Allegheny Reservoir. One additional nest is just outside the Forest boundary on an island (private land) in the Allegheny River near

Tionesta. The nesting success for the three nests is presented in Table 2 (PA Game Commission, 1999 unpublished). Predator guards have been placed on the Tionesta, Cornplanter and Kinzua nests. Causes of nest failures in 1994, 1995 and 1999 (PA Game Commission, 1999 unpublished) are unknown.

Table 2. Bald Eagle Nesting Status for the ANF

		Young Produced									
Nest Location	**Year Found**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**00**	**Total**
Kinzua	1993	-	1	0	2	2	1	2	0	3	8
Cornplanter	1998	-	-	-	-	-	-	1	2	3	3
Tionesta	1993	2	2	2	0	2*	1	2	2	0	13

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

Habitat

In Northwestern Pennsylvania, Bald eagles nest in large trees near a body of water. Two of the three 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.

Eagles forage along rivers, large streams, and lakes. They often perch in trees near the waters' edge and wait for fish or waterfowl to come along. In winter, they sometimes congregate in winter roosts. These roosts commonly have 6 - 10 eagles in one or two 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 on the Allegheny Reservoir. The nest near Kinzua Dam has been attended by three adults 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. No winter roosting sites have been found on the ANF despite winter searches to locate them.

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 forest. Eagle sightings have been made at Buzzard Swamp, Beaver Meadows, Twin Lakes, Mead Run ponds, and the Owls Nest ponds. Despite both winter and summer surveys, no roosting areas have been identified on the ANF where eagles gather on a regular and consistent basis.

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

Habitat in the East Side Project Area

Although no nests are known to exist within the project area, several of the large drainages within the project area are occassionally used as foraging areas. Eagles are often seen perching along the shoreline on Tionesta Creek, Salmon Creek, and the Allegheny Reservoir. No winter or summer roosts that are consistently used by eagles have been identified in the project area.

YELLOW-BELLIED FLYCATCHER

The primary breeding range for this state threatened species is the boreal conifer forests of Canada. In Pennsylvania it nests in mossy, poorly drained areas in extensive sections of northern hardwood forests. On the ANF it has been documented nesting in an unsalvaged portion of the 1985 tornado swath (D. Gross, pers. comm.).

This nesting site is within the East Side project area but is more than a mile from the closest treatment area. Unlike other flycatchers, the Yellow-bellied flycatcher nests on the ground usually concealed in sphagnum moss. The home range of this rare flycatcher is between one and ten acres (DeGraff *et al*., 1992). The Pennsylvania Breeding Bird Atlas project confirmed this species in only two survey blocks (Brauning, 1992). Habitat management for this species on the ANF focues on maintaining suitable wet areas with sphagnum moss.

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. This Biological Evaluation 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 recovery plan was completed by a team of bat experts 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. More than 85 percent of the known Indiana bats (about 292,000) winter in large limestone caves in Indiana, Kentucky, and Missouri. Pennsylvania has eight known hibernacula (Hart *et al*., 1997) with an estimated population of more than 300 Indiana bats (USDI-FWS, 1996). The closest known hibernaculum to the ANF is in Armstrong County, about 60 miles southwest of the ANF.

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) and the BA (p. 15) (USDA-FS, 1998). Recently, Indiana bats have been found on the Wayne National Forest in southeast Ohio.

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. (BA, p. 15) (USDA-FS, 1998).

Occurrence of the Indiana Bat on the Allegheny National Forest

In May 1998, a two-year survey of potential Indiana bat foraging areas was initiated by the ANF as part of a partnership agreement with Pennsylvania State University, Altoona Campus. Twenty-five sites which were well distributed across the ANF landscape were selected for sampling in 1998 using both mist nets and anabat detectors. Fish and Wildlife Service mistnetting protocols are being used and supplemented with anabat detectors. The progress report for the first year of surveys revealed that Indiana bats were detected at seven of the 25 sites, and one Indiana bat was caught in a mistnet at one of the seven sites (Gannon, 1999 unpublished).

Another 32 new sites were sampled in 1999 along with re-sampling one 1988 site; no Indiana bats were captured at any of these sites. Indiana bats were detected at four new sites in 1999 bring the total number of sites where Indiana bats were detected to eleven.

During the summer of 2000, forty-six new sites were surveyed for bats by Pennsylvania State University crews. At least 23 of these new sites were within the East Side project area. No Indiana bats were captured at any of these 23 sites but preliminary analysis of the anabat data resulted in Indiana bats being detected at site 49, located within the Tionesta Scenic Area near the intersection of Forest Road 148 and a pipeline right-of-way. Indiana bats were also detected but not captured at this site in 1999. The closest proposed treatment area to this site is approximately 1 ½ miles to the west.

Over the 3 year period, Penn State biologists have surveyed 103 sites on the Allegheny National Forest and one Indiana bat was captured. In addition, a proposed pipeline project within the East Side project area resulted in the need to survey 12 sites for bats. The survey was completed by BHE Environmental Inc., and resulted in no Indiana bats being caught. The total number of survey sites on the Allegheny National Forest over the past 3 years totals 115 with only one Indiana bat captured.

Bat surveys are scheduled to continue in 2001 along with implementation of a telemetry study to learn more about roosting sites and daily movements.

Within the Project Area

Preliminary analysis indicates that within the East Side project area one Indiana bat was caught and 4 sites had Indiana bat detections (Tionesta Scenic Area, Tionesta Research Natural Area, Mead Run duck ponds, and Big Mill Creek). Two sites (Tionesta Scenic Area #49 and Big Mill Creek #5) had Indiana bat detections in two different years.

Life History

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 May to early July. Juveniles become volant beginning in early July to early August. Juveniles may mate their first autumn (USDI-FWS, 1996).

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 of their diet.

Habitat

Summer Roosting Habitat

Upon emergence from the hibernacula in the spring, females travel varying distances to their summer maternity roosts. 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).

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 mile from a water source. The quality of habitat for roosting 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 e*t 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 which depend on these naturally 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 make them more attractive by opening up the forest canopy allowing more sunlight to hit the tree making it warmer and thermally more stable (USDI-FWS, 1996).

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). Forest Plan standards and guidelines for snags and den trees ensure that at least 5 to 10 snags per acre and at least 3 den trees per acre are retained on all sites receiving a timber harvest treatment. Although the exact number of snags and den trees retained will vary by management area, they will be well distributed across the landscape in all areas (USDA-FS, 1986). 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. An evaluation of the landscape distribution of dead and live trees on the ANF shows there are vast numbers of potential roost trees within the 95 percent of the acres that are forested (USDA-FS, 1998).

Results of radiotelemetry 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 mile (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 suggest 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 >=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 much 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) its spatial relationship to water sources and foraging areas (USDI-FWS, 1996).

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 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, 1996). Cave gates that restrict air flow 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 (PA Game Commission, 1995 Unpublished).

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 ANF has developed local habitat evaluation factors based upon a combination of information contained in the HSI model and local data. Habitat evaluation criteria are defined on pages 3-4 of Appendix E of the BA (USDA-FS, 1998).

The ANF in Context with a Larger Scale of Analysis

The ANF is part of a larger forested landscape which 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, 1993). 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, 1993).

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 BA 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 Indiana bat habitat evaluations (deCalesta and Ordiway, pers. comm). Pertinent findings of these analysis 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 which serve as potential roost habitat.
- Currently, there are over 187,600 acres of maternity landscape habitat in an optimal condition (37 percent of the ANF). The potential exists to develop an additional 163,400 acres of optimal habitat, forest-wide (32 percent of the ANF) by reducing canopy closure.
- The distribution of live trees which contribute towards maternity roost habitat meet optimal habitat conditions, and are found across 73 percent of the ANF. The distribution of dead trees meet a mix of optimal and suitable habitat conditions. Optimal distribution of 9" diameter dead trees are found (38 percent of the ANF). Suitable distribution of larger diameter (12 inch trees) are found (28 percent 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 percent of the ANF). The potential exists to develop an additional 257,400 acres of optimal habitat, forest-wide (50 percent of the ANF) by reducing canopy closure.

Habitat Within the Project Area

Using the HSI model, approximately 39 percent of the acres proposed for treatment currently contain canopy closures considered to be optimum roosting habitat. About 27 percent of the acres proposed for treatment have canopy closures considered to be optimum foraging habitat.

A comparison of the existing live and dead trees within the project area with the live and dead tree requirements in the HSI model are provided in Tables 3 and 4. For optimal dead tree requirements it appears that the project area easily fulfills the requirements for numbers of nine and twelve inch trees. Some question remains if 30 percent of the project area contains at least one 20 inch dead tree per two acres. The project area easily fulfills the optimal live tree requirements.

Table 3: Comparison of Indiana Bat Dead Tree Habitat Requirements with existing Conditions for the East Side Project Area

DBH Class	Indiana Bat Habitat Requirements (# of Trees)		Existing Habitat for East Side Project (# of Trees) [4]	Standard Error (# of Trees) [3]
	Suitable[1]	Optimal[2]		
≥ 9"	3/Acre	5/Acre	10.3/Acre	±1.8
≥ 12"	1 per 10 Acres		4.4/Acre	±1.2
≥ 20"		1 per 2 Acres	.5/Acre	± .3
	Source: USDI-FWS Biological Opinion *(USDA-FS. 2000, p. 16)*		***Source:*** Preliminary analysis of 1998/1999 FHM data for ANF (37 plots on 201,208 acres which includes and surrounds East Side Project Area) (Liebhold, pers. comm.)	

1 - Suitable: ≥ 5% of landscape is forested and meets criteria.
2 - Optimal: ≥ 30% of landscape is forested and meets criteria.
3 - 95% confidence interval for estimates = (Estimated trees per acre) ± (2)(Standard error of the mean)
4 - 97% of East Side Project Area is forested.

Table 4: Comparison of Indiana Bat Live Tree Habitat Requirements with existing Conditions for the East Side Project Area

DBH Class	Indiana Bat Habitat Requirements (# of Trees)		Existing Habitat for East Side Project (# of Trees)	Standard Error (# of Trees) [3]
	Suitable[1]	Optimal[2]		
≥ 9"	8/Acre	16/Acre	70/Acre	±6.7
≥ 20"	1/Acre	3/Acre	8.9/Acre	±1.9
	Source: USDI-FWS Biological Opinion *(USDA-FS. 2000, p. 16)*		***Source:*** Preliminary analysis of 1998/1999 FHM data for ANF (37 plots on 201,208 acres which includes and surrounds East Side Project Area) (Liebhold, pers. comm.)	

1 - Suitable: ≥ 5% of landscape is forested and meets criteria.
2 - Optimal: ≥ 30% of landscape is forested and meets criteria.
3 - 97% of East Side Project Area is forested.

Sample is for Mortality Zones 6, 7 and 8 covering 201,208 acres

Dead Tree Composition Within the Project Area

ANF personnel use the Indiana Bat Habitat Suitability Index Model (Romme et al, 1995) as modified in the ANF T&E BA (pp. 19-21) as the basis for evaluating habitat conditions. Vegetative conditions can be evaluated against criteria that define suitable habitat and optimal habitat (USDA-FS 1998, Appendix E, p. 3). Summer maternity landscape/roost habitat can be described by determining what portion of an area meets the criteria in terms of minimum numbers of live and dead trees by size class, and in terms of canopy closure. If conditions for summer maternity roost habitat are met, then conditions for male habitat are met as well. For habitat to be considered suitable, 5% of the landscape under consideration must be forested and must meet the criteria shown in the "suitable" column in Table 3 above. For a landscape to be classified as optimal, 30% of the landscape must be forested and must meet the criteria in the "optimal" column. (USDA-FS 2000, p. 16***)*** The following table and discussion considers numbers of live and dead trees; discussion of canopy closure can be found at the end of the environmental consequences discussion in this chapter.

The information in this table suggests that we can have 95% confidence that the average condition across the East Side Project area includes between 6.7 and 13.9 dead trees per acre ≥9" DBH, between 2.0 and 6.8 dead trees per acre ≥ 12" DBH, and between 0 and 1.1 dead trees per acre ≥20" DBH. With this as the average condition, the likelihood of finding 5% of the area meeting suitable habitat conditions is quite high. Because the estimated range of average number of dead trees greater than 20" DBH includes numbers below the threshold for optimum habitat, we are less certain of meeting that condition. However, only 30% of a landscape needs to provide more than one ≥20" DBH tree per two acres, so it is quite possible (with a project area that is 97% forested) that condition would be met as well.

Live Tree Composition Within the Project Area

As was mentioned in the paragraph preceding Table 3, roost habitat can be described by determining what portion of an area meets the habitat criteria in terms of minimum numbers of live and dead trees by size class. Table 4 displays a comparison of the Indiana bat habitat requirements for live trees by size class with the existing condition for the East Side Project area.

The information in this table suggests that we can have 95% confidence that the average condition across the East Side Project area includes between 56.6 and 83.4 live trees per acre ≥9" DBH and between 5.1

and 12.0 live trees per acre ≥20" DBH. With this as the average condition, the likelihood of finding 5% and 30% of the area meeting suitable habitat conditions is quite high.

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, 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, the Northern Long-eared bats was recorded at 6 of the 7 sites where Indiana bats were detected. An additional 32 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. Data from the summer of 2000 has not been compiled at this time.

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.

NORTHERN WATER SHREW

This species is found in wet areas, especially grass/sedge marsh or shrub zones along ponds and streams in coniferous forests (Wrigley *et al*., 1979). It is believed this species travels along the waters edge and hides from predators among rocks, root wads and logs. Northern water shrews actually dive into the water and forage on benthic invertebrates. Maintaining the quality of the aquatic environment and streambank structure, including undercut banks and log structures where the shrews feed and live is very important (Bier, 1994). Most of the Northern water shrews reported in Pennsylvania were collected in montane areas near high gradient rock-bedded creeks with the surrounding forest consisting of heavy stands of hemlock, spruce and rhododendron (Genoways and Brenner, 1985). DeGraaf and Rudis (1986) report this species to have a small home range of from one-half to one acre in size.

Habitat within the East Side Project Area

The water shrew was surveyed for and collected on the ANF along the upper reaches of the Bear Creek drainage, a tributary to the Clarion River. The stream width at the two collection points varied from 2 to 5 meters and stream depths ranged from 0.1 and 1.0 meters. Canopy closure ranged from 0 to 75 percent and understory trees were predominantly hophornbeam and witch hazel, while ground cover varied widely and included hayscented, New York, sensitive and cinnamon fern (Bier 1994). The 1994 survey report recommends maintaining water quality of streams and associated wetlands, protecting against non-point siltation and certain pesticides, and protection of stream banks and critical forested habitat along stream corridors. A Northern water shrew was also collected in the Tionesta Research Natural Area by Dr. Dave deCalesta in the mid 1990s (Dave deCalesta, pers. comm.).

All of the major drainages within the Eastside project area where water quality and stream flows support brook trout reproduction and a diverse aquatic insect assemblage (water shrew food sources) are potential water shrew habitat.

CLUBSHELL MUSSEL AND NORTHERN RIFFLESHELL MUSSEL

Both of these freshwater mussels were widespread throughout most of the Ohio River 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).

The Clubshell mussel and Northern riffleshell mussel are both found in the Allegheny River (Western Pennsylvania Conservancy, 1989b). Populations have declined from historic levels and viablility of some sub-populations is threatened.

During the summer of 1994, the Western Pennsylvania Conservancy conducted mussel surveys on 10 smaller streams on the ANF, within the Allegheny River watershed (Bier *et al*., 1997). East Branch Tionesta Cr., Kinzua Cr., Minister Cr., Salmon Cr., S. Branch Kinzua Cr., S. Branch Tionesta Cr., Sugar Run, Tionesta Cr. and West Branch Tionesta Cr. were surveyed. Nine species of freshwater mussels were documented, but no clubshell or northern riffleshells were collected.

GREEN-FACED CLUBTAIL

In a 1993 survey of dragonflies and damselflies on the Clarion River, the Green-faced clubtail was found to be numerous in the main stretch of the Clarion River but absent from survey sites along Millstone Creek (Western Pennsylvania Conservancy and Carnegie Museum of Natural History, 1994). Surveys of 10 streams on the ANF in 1994 did not reveal the presence of any Green-faced clubtails (Bier *et al.* 1997). This species may be restricted to the Clarion River and microhabitats located there.

LONG-SOLID MUSSEL

The Long-solid mussel has a Nature Conservancy global rank of G4 (secure globally but may be quite rare in parts of its range) and a state rank of S2S3 (Imperiled in State because of rarity).

The Long-solid mussel has been documented in Tionesta Creek near Kelletville by Winters (1973 as reported in Bier *et al.* 1997)) and Bier *et al*., (1997). Of ten streams surveyed for mussels on the Allegheny National Forest (ANF), this was the only site where the Long-solid was found (Bier *et al*., 1997). The Long-solid was not found in the Allegheny River during 1909 and 1989 mussel surveys (Western Pennsylvania Conservancy, 1989b).

Three factors which influence the distribution and abundance of healthy mussel populations in the Allegheny National Forest include (1) landscape geology/topography, (2) watershed size, and (3) water quality, both existing and historic. ANF streams are within the Unglaciated Allegheny Plateau Section of northwestern Pennsylvania. Some sub-watersheds within the Allegheny River basin drain glacial landscapes that result in mineralized and buffered waters and sand/gravel substrates favorable to freshwater mussels. However, ANF streams are generally less buffered, more acidic, medium to high gradient and colder than optimum for mussels (Bier *et al*., 1997).

Bier *et al.*, (1997) have found that a minimum watershed size of about 20 square miles is necessary to support mussel populations. Tionesta Creek watershed is 478 square miles and supports at least 8 mussel species (Bier *et al*., 1997).

Water quality can also be a limiting factor. Bier *et al.* (1997) reported that Ortmann found poor water quality throughout the region near the turn of the century. Some watersheds have experienced past water quality and sedimentation problems due to oil and gas operations, poorly designed roads, and sewage effluents from small towns. Many of the past water quality problems have been remedied and water quality has improved within the Tionesta drainage over the past 20 years (Bier *et al*., 1997).

HARPOON CLUBTAIL

This species is a member of the Gomphidae family and prefers lotic (running water) habitats. Nymphs lie partially buried in sand and silt substrates to ambush their prey. In the 1994 Clarion River Study (W. PA. Conservancy and Carnegie Museum, 1994), 6 adults were sampled from 2 of the 9 study sites. During the 1997 survey conducted on the Forest (Bier *et al*., 1997), 25 specimens were sampled from 9 of the 10 streams surveyed. Four of these six documented sites are within the Eastside project area or on streams that pass through the project area.

RAPIDS CLUBTAIL

This species is a member of the Gomphidae family and prefers lotic (running water) habitats. Nymphs lie partially buried in sand and silt substrates to ambush their prey. In the 1994 Clarion River Study (W. PA. Conservancy and Carnegie Museum, 1994), 1 naiad and 23 adults of this species were sampled from 5 of the 9 study sites. This species was not collected during the 1997 survey (Bier *et al*., 1997).

MUSTACHED CLUBTAIL

This species is a member of the Gomphidae family and prefers lotic (running water) habitats. Nymphs lie partially buried in sand and silt substrates to ambush their prey. In the 1994 Clarion River Study (W. PA. Conservancy and Carnegie Museum, 1994), 1 adult was sampled at 1 of the 9 sites and naiads were sampled from 4 of the 9 study sites. This species was not collected during the 1997 survey (Bier *et al.*, 1997).

MIDLAND CLUBTAIL

This species is a member of the Gomphidae family and prefers lotic (running water) habitats. Nymphs lie partially buried in sand and silt substrates to ambush their prey. In the 1994 Clarion River Study (W. PA. Conservancy and Carnegie Museum 1994), 1 adult was sampled from 2 of the 9 study sites and 18 naiads were sampled from 5 of the 9 sites. During the 1997 survey conducted on the Forest (Bier *et al*., 1997), 5 specimens were sampled from 3 of the 10 streams surveyed. Two of the three collection sites were within the Eastside project area or on streams that pass through the project area.

SKI-TAILED EMERALD

This species is a member of the Cordulidae family and prefers slow streams and creaks near swamps or bogs (Western PA Conservancy and Carnegie Museum, 1994). They are active hunters with long, spider like legs (Merritt and Cummins, 1996). Prior to the 1994 survey of the Clarion River, this species was only known from the central part of the State (Western PA Conservancy and Carnegie Museum, 1994). However in the 1994 Clarion River Study (W. PA. Conservancy and Carnegie Museum, 1994), adults were sampled from 1 of the 9 study sites and naiads of this species were documented from 2 of the 9 study sites. During the 1997 survey conducted on the Forest (Bier *et al.*, 1997), 2 adults and 1 naiad were sampled from 3 of the 10 streams surveyed. Two of the three documented sights are within the Eastside project area or on streams that pass through the project area.

UHLER'S SUNDRAGON

This species is a member of the family Cordulidae family and prefers lotic (running water) habitats. Prior to the 1994 survey of the Clarion River, this species was only known from the central part of the State (Western PA Convergency and Carnegie Museum, 1994). However in the 1994 Clarion River Study (W. PA. Conservancy and Carnegie Museum, 1994), naiads of this species were documented from 3 of the 9 study sites. During the 1997 survey conducted on the Forest (Bier *et al*., 1997), 1 adult was sampled from 1 of the 10 streams surveyed. This documented collection is on Kinzua Creek.

MAINE SNAKETAIL

This species is a member of the family Gomphidae and prefers lotic (running water) habitats. Nymphs lie partially buried in sand and silt substrates to ambush their prey. In the 1994 Clarion River Study (W. PA. Conservancy and Carnegie Museum, 1994), 3 adults were sampled from 2 of the 9 study sites and 32 naiads were sampled from 6 of the 9 study sites. During the 1997 survey conducted on the Forest (Bier *et al*., 1997), 6 adults and 71 naiads were sampled from 5 of the 10 streams surveyed. Four of the five documented sights are within the Eastside project area or on a stream which passes through the project area.

ZEBRA CLUBTAIL

This species is a member of the family Gomphidae and prefers lotic (running water) habitats. Nymphs lie partially buried in sand and silt substrates to ambush their prey. In the 1994 Clarion River Study (W. PA. Conservancy and Carnegie Museum, 1994), 2 naiads were sampled from 2 of the 9 study sites. During the 1997 survey conducted on the Forest (Bier *et al*., 1997), 31 naiads were sampled from 5 of the 10 streams surveyed. Four of the five documented sites are within the Eastside project area or on streams flowing through the project area.

SMALL WHORLED POGONIA

In Pennsylvania this species occurs on dry oak sites on benches or saddles or near the beginning of intermittent drainages, usually on south or southeast facing slopes. One population occurs 15 miles west and another 55 miles east of the ANF. Although suitable habitat exists on the ANF, its preference by deer may be a limiting factor affecting occurrence of this species on the ANF. Since 1987, more than 227,000 acres on the ANF have been surveyed, but no plants have been found.

Following discussion with the FWS and Paul Wiegman of the Western Pennsylvania Conservancy, the ANF implemented new survey procedures in 1994. Potential habitat for this species includes topographic saddles and swales between ridges, slopes with benches and/or ephemeral streams, mature or maturing forest conditions, and sites with little or no understory and without dense fern cover. This species occurs across a large scattered range, nowhere is it abundant.

WEIGAND'S SEDGE

This plant is an eastern or northeastern North American maritime species. This species is located mainly in acidic soils or drier, sometimes disturbed, margins of acidic sphagnum bogs or fens (Ostlie, 1990 unpublished). Its also been found on acidic, sandy flats and shrubby sphagnum bogs (Michigan). It is known to occur on two sites in PA, both south of the glacial boundary within the Allegheny mountains. This sedge has been found on four sites in Elk and McKean counties, outside the Allegheny National Forest (Ostlie, 1990 unpublished; Rhoads and Klein, 1993). Occupied habitat in these areas has been characterized by high plateau, white pine/hemlock/mixed hardwood swamps. Wiegand's sedge is abundant at these sites, especially where beaver activity has killed the trees due to high water inundation.

Historic collections within Pennsylvania suggest open sphagnum bogs as habitat (Ostlie, 1990 unpublished).

A wetland rare plant survey conducted on the National Forest in 1989-90 by the Western Pennsylvania Conservancy (1989) did not detect Wiegand's sedge on any sites across the ANF. Also, none were found during a plant survey of the Clarion River Watershed by Williams (1994). Optimal or ideal habitat such as shrubby sphagnum bogs, sphagnum openings in swamps typically formed by old beaver activity, or conifer mixed-hardwood swamps occur in scattered locations across the ANF.

BUTTERNUT

Butternut is being killed throughout its range in North America by *Sirococcus clavigigeneti juglandacearum*, a fungus of unknown origin causing multiple branch and stem cankers that eventually girdle infected trees (USDA-FS, 1993).

Butternut is a small to medium sized tree that seldom exceeds 75 years of age. It commonly grows on rich loamy soils, as well as on dry rocky soils of limestone origin. On deeper soils it forms a taproot and wide-spreading lateral roots. Butternut never occurs in pure stands, although it is occasionally abundant locally in mixed hardwood forests (Rink, 1990). Butternut is a shade intolerant species and must be in the overstory to thrive. Young trees may withstand competition from the side but will not survive shade from above. Reproduction can only be sustained in stand openings or fields where shade cannot impede its development (Ostry *et al*., 1994). Scattered individual butternut trees occur throughout the project area.

CREEPING SNOWBERRY

Creeping snowberry is known to occur in a wet area along Queen Creek on the ANF (Western PA Conservancy, 1989). It has also been documented from Elk and McKean Counties (Rhoads and Klein, 1993). This facultative wetland species occurs in bogs, swamps, and other types of wetlands, usually growing on hummocks or near old tree stumps. Surveys conducted in 1998 and 1999 did not document this sensitive plant within the project area.

THREAD RUSH

This herbaceous perennial is known to occur in Warren and McKean Counties. Thread rush is a facultative wetland species that is found in bogs and sandy shores (Rhoads and Klein, 1993). This species was not found during the 1989 wetland plant survey on the ANF (Western PA Conservancy, 1989a). Maintaining the integrity of wetland and riparian systems will benefit this species. Surveys conducted in 1998 and 1999 did not document this sensitive plant in the project area.

ROUGH COTTON-GRASS

This obligate wetland species is found in bogs. It is documented as occurring in Warren County (Rhoads and Klein, 1993). This species was not found during the 1989 wetland plant survey (Western PA Conservancy, 1989a), nor in surveys within the project area in 1998 and 1999. Maintaining the ecological integrity of bogs and wetlands will benefit this species.

SPOTTED DARTER

This regionally sensitive species inhabits deep swift riffles of large streams over a substrate of large rubble (Cooper, 1985). This darter has been found sporadically in a few tributaries of the Ohio River system in New York and Pennsylvania. Collection of this species has been made near the Allegheny National Forest in French Creek in Crawford County (USDI-FWS, 1958-1974). The Spotted darter has also been documented as occurring in the Allegheny River (Lee, 1975).

TIPPECANOE DARTER

This darter prefers riffle areas 4 to 20 inches deep, in clean rivers and large creeks with a bottom of pea-sized clean gravel and a high bottom current velocity (Wild Resource Conservation Fund, 1995). This darter has been found in French Creek and in the Allegheny River (USDI-FWS, 1958-1974).

LONGHEAD DARTER

This species most frequently inhabits fast, rocky riffles, and is sometimes found in large pools below riffles, but only where the current is sufficient to keep the bottom free of silt (Cooper 1985). Records of this species have been made in several streams such as Conewango Creek, Brokenstraw Creek, and the Allegheny River, in Warren County and East Hickory Creek in Forest County (USDI-FWS, 1958-1974).

MOUNTAIN BROOK LAMPREY

This species occurs in gravel riffles and sandy runs of clean, clear high gradient streams. This non-parasitic species has a scattered north-south distribution on the west slope of the Appalachians from New York to Tennessee. It is usually found further upstream in the headwaters than its parasitic counterpart, the Ohio Lamprey (Cooper, 1983). The status of this species parallels that of the Ohio Lamprey and deterioration or destruction of the physical habitat and associated water quality have reduced its preferred habitat.

This species has documented occurrence from Spring Creek in Forest County, Pennsylvania (USDI-FWS, 1958-1974).

GRAVEL CHUB

The Gravel chub is a Pennsylvania state listed endangered species. It prefers gravel-bottomed streams and rivers, preferably slow-moving and deep, but if the gravel becomes silted over, they will move into faster, shallow regions (Hubbs and Crowe, 1956). The biology of this species is unknown. This species historically occurs in the upper Allegheny River on the Allegheny National Forest (Wild Resource Conservation Fund, 1995). Collections of this species have been made in the Allegheny River, Warren Co., approximately 2-3 miles west of Warren, PA. (USDI-FWS, 1958-74).

CHANNEL DARTER

The Channel darter is a Pennsylvania state listed threatened species. This species spawns in spring to mid-summer in areas downstream from large stones scattered over a clean sand, small gravel bottom (Wild Resource Conservation Fund, 1995). This species of darter is tolerant to turbidity and is often found associated with the logperch *Percina caprodes* and the mimic shiner *Notropis volucellus*. The channel darter shows sexual dimorphism, with the male being larger than the female (Cooper, 1983). Collections of this species have been made in the Allegheny River, Warren Co., PA. near the Kinzua Dam (Andersen, 1975).

GILT DARTER

The gilt darter is a Pennsylvania state listed threatened species. This species of darter lives in riffles of small to moderate-sized rivers (Page, 1983) with a moderate to fast current flowing over gravel-rubble bottoms. The middle to lower sections of riffles and pools are preferred (Wild Resource Conservation Fund, 1995). This species shows sexual dimorphism with the male being larger than the female (Page, 1983). Historically, this species was found in the upper Allegheny River and collections have been made in the Allegheny River, Warren Co., PA. in the vicinity of Kinzua Dam (USDI-FWS, 1958-1974) and in the Tidioute area (Lee, 1971). It was recently collected in South Branch Kinzua Creek (Woomer and Lee, 1994) and Chappel Fork (Woomer and Lee 1991).

DESCRIPTION OF ALTERNATIVES

ALTERNATIVE 1 (PROPOSED ACTION)

Alternative 1 proposes reforestation and timber harvest activities that will promote forest ecosystem restoration in response to changes in vegetation that have occurred as a result of light to severe mortality and decline. This alternative initiates salvage regeneration harvest and reforestation prescriptions in areas of severe mortality. It proposes salvage thinnings in areas of light to moderate mortality. It also proposes only reforestation activity in stands that are severely impacted by mortality but no longer have commercially viable harvest options. Vegetation is managed primarily by using even-aged systems in MA 3.0 and 6.1, and uneven-aged systems in MA 2.0, per Forest Plan direction (Please see Table 5). Alternative 1 also proposes vegetative management prescriptions and wildlife habitat enhancement activities that meet Forest Plan objectives for MA 2.0 and MA 3.0 in stands that are not impacted by mortality. Vegetation is managed primarily by using even-aged systems in MA 3.0, and uneven-aged systems in MA 2.0 per Forest Plan direction (Please see Table 5 and Table 7).

Alternative 1 proposes transportation system management that provides access to support timber harvest, reforestation and wildlife habitat activities (Please see Table 6).

Alternative 1 will generate a harvest volume of approximately 34 MMBF in the first entry and 30 MMBF in a second entry that will occur in 7-10 years (Please see Table 5).

Alternative 1 is the Forest Service preferred alternative

Even-aged Regeneration Harvests

Even-aged regeneration harvest prescriptions include treatments that occur in stands that are severely impacted by tree mortality and decline, as well as healthier stands. Reforestation treatments such as herbicide application, site preparation for natural regeneration, fertilization, area fencing, and planting are prescribed based upon site specific needs within a stand. The combination of timber harvest and reforestation activity results in the restoration and maintenance of forested stands, the establishment of vertical and horizontal vegetative diversity, the production of wood products, and the establishment of age class diversity across the landscape. Even-aged regeneration harvests are proposed only in MA 3.0 and MA 6.1.

Even-aged Thinning Harvests

Even-aged thinning prescriptions include treatments that occur in stands that are lightly to moderatley impacted by tree mortality and decline, as well as healthier stands where stocking levels are high. These timber harvest activities are designed to maintain the health and vigor of stands and provide wood products to meet social demand. The objective of treatments will be to establish even-aged structure in these stands and to produce wood products. Even-aged thinning harvests are proposed only in MA 3.0.

Reforestation Only

Reforestation treatments with no associated timber harvest occur in stands that are severely impacted by tree mortality and decline and where no opportunity for commercial timber harvest activity exists. Reforestation treatments such as herbicide application, site preparation for natural regeneration, fertilization, area fencing and planting are prescribed based upon site specific needs within a stand. The application of reforestation treatments in stands that have been severely impacted by mortality results in the restoration of forested stands, the establishment of vertical and horizontal vegetative diversity, and the establishment of age class diversity across the landscape. Reforestation only treatments occur in MA 3.0 and MA 6.1.

Uneven-aged Harvests

Uneven-aged harvest prescriptions include treatments that occur in stands that are severely impacted by tree mortality and decline, as well as healthier stands. Reforestation treatments such as herbicide application, site preparation for natural regeneration, area fencing and planting are prescribed based upon site specific needs within a stand. The combination of timber harvest and reforestation activity results in the restoration and maintenance of forested stands, the establishment of vertical and horizontal vegetative diversity, the production of wood products, and the establishment of age-class diversity within individual stands. Uneven-aged regeneration harvests are proposed in MA 2.0, MA 3.0 and MA 6.1.

Release

Release treatments are proposed in 15 – 30 year old stands where species composition is dominated by species such as pin cherry or black birch. The release of more desirable, commercially valuable species such as black cherry, red maple and other hardwoods will result in forest type composition that achieves long term Forest Plan objectives. Release treatments are proposed in MA 2.0 and MA 3.0.

Wildlife Habitat Enhancements

Wildlife habitat improvement activities are proposed to increase species diversity in the project area by planting shrub and tree species that are absent or found in small amounts, to establish habitat components such as permanent openings, to promote the growth of existing trees and shrubs beneficial to wildlife. Wildife treatments are proposed in MA 2.0. MA 3.0 and MA 6.1.

Transportation Management

Transportation management activities include road construction, road reconstruction (including betterment, re-alignment and restoration), decommissioning of existing roads, expansion of existing stone pits and the development of new pits. Road construction and reconstruction proposals occur on segments of roads that are needed to support vegetative management activities. No long skids are proposed. These activities provide transportation systems that are adequate to support the management activities on National Forest lands.

Table 5. Alternative 1 - Vegetation Treatments (acres)

Activity	MA 3.0	MA 2.0	MA 6.1	Total	Herbi-cide	Site Prep	Ferti-lize	Fence	Plant	TSI/ Release
EVEN-AGED REGENERATION HARVESTS										
Green										
Clearcut (includes 18 ac. wildlife openings)	112	0	0	**112**	21	0	13	40	21	16
Shelterwood seed cut (1st entry)/Removal cut (2nd entry)	589	0	0	**589**	610	547	311	236	66	34
Shelterwood removal cut	29	0	0	**29**	9	3	44	25	9	44
Shelterwood removal cut (delay)	88	0	0	**88**	87	82	28	74	24	0
Prep cut/Two-aged	142	0	0	**142**	125	139	0	138	24	0
Reforestation treatments only	76	0	0	**76**	43	21	29	6	18	35
Salvage										
Clear-cut	84	0	0	**84**	78	85	85	39	39	0
Shelterwood seed cut (1st entry)/Removal cut (2nd entry)	1284	0	0	**1284**	1227	979	535	896	283	21
Shelterwood removal cut	58	0	0	**58**	6	25	43	5	5	0
Shelterwood removal cut (delayed)	592	0	0	**592**	574	473	191	452	109	82
Prep cut/Two-aged	71	0	0	**71**	71	71	0	39	14	0
Two-aged	132	0	0	**132**	132	119	0	79	36	0
Reforestation treatments only	28	60	90	**178**	169	150	0	90	11	0
INTERMEDIATE TREATMENTS										
Green										
Commercial Thinning	1778	0	0	**1778**	0	0	0	0	0	0
Salvage										
Salvage Thinning	2479	0	0	**2479**	5	1	14	3	3	0
UNEVEN-AGED										
Green										
Selection	55	63	0	**118**	43	68	0	43	43	63
Group Selection	0	154	0	**154**	127	154	0	25	0	154
Transition Cut	18	0	0	**18**	0	0	0	0	0	0
Salvage										
Selection	28	12	0	**40**	12	12	0	12	12	12
Group Selection	0	115	0	**115**	80	115	0	80	80	115
Total	**7643**	**404**	**90**	**8137**	**3419**	**3044**	**1293**	**2282**	**797**	**576**

Table 6. Alternative 1 - Proposed Transportation System Activities

ROAD SYSTEM ACTIVITIES (Miles)	Private	MA 2.0	MA 3.0	MA 6.1	MA 6.2	Total
New Construction	0.2	0.1	14.9	0	0	15.2
Road Reconstruction						
Existing Road Betterment	1.2	0.3	14.5	0	0	16.0
Existing Road Realignment	0.3	0	1.2	0	0	1.5
Existing Road Restoration	6.8	6.1	76.5	0.2	2.4	92.0
Total Road Reconstruction	8.3	6.4	92.2	0.2	2.4	109.5
Existing Road Decommissioning	0	0	7.2	0	0	7.2
Temporary Road/Long Skid	0	0	0	0	0	0
STONE PITS (Number of Pits)						
Existing Pit Expansion	0	1	32	0	0	33
New Pit Development	0	2	8	0	0	10

Table 7. Alternative 1 - Wildlife Treatments

Wildlife Treatments	MA	Acres
Create/Maintain Openings	3.0	2
Regenerate Aspen	3.0	92
Seeding	3.0	54
Planting	3.0	466
Planting	2.0	187
Planting	6.1	15
Fencing	3.0	43
Prune and Release Apple trees (108)	3.0	36
Release mast producing shrubs/trees	3.0	14
Conifer release	3.0	36
Nest Boxes	3.0	14
Catch basins and fish structures	3.0	9
Construct water holes	3.0	7

ALTERNATIVE 2

Alternative 2 proposes the salvage of dead, dying and damaged trees in stands where light to severe mortality has occurred and sufficient volume is found for economically viable timber sales. (Please see Table 8). This alternative utilizes the wood fiber and sawtimber volume that has developed following tree mortality and decline. In areas where commercial sales are not viable, non-commercial removal of dead and dying trees may occur for safety or visual resource reasons. Alternative 2 proposes no wildlife habitat enhancement work.

Alternative 2 proposes transportation system management that provides access to support timber harvest activities (Please see Table 9).

Alternative 2 will generate a harvest volume of approximately 6 MMBF in the first entry. There is no second entry in this alternative (Please see Table 8).

Salvage Thinning Harvests

The objective of treatments in this alternative is designed to achieve neither even-aged nor uneven-aged structure – the objective is only to remove the dead and dying trees while commercial value still exists in order to recover the volume that would otherwise be lost. No effort to regenerate stands that have been severely impacted by mortality will be made. Regeneration treatments will be deferred until some time in the future.

In areas where safety concerns or visual concerns exist, dead and dying trees may be removed non-commercially.

Transportation Management

Transportation management activities include road construction, road reconstruction (including betterment, re-alignment and restoration), decommissioning of existing roads, expansion of existing stone pits and the development of new pits. Road construction and reconstruction proposals occur on segments of roads that are needed to support vegetative management activities. No long skids are proposed. These activities provide transportation systems that are adequate to support the management activities on National Forest lands.

Table 8. Alternative 2 - Vegetation Treatments (acres)

Activity	MA 3.0	MA 2.0	MA 6.1	Total	Herbi-cide	Site Prep	Ferti-lize	Fence	Plant	TSI/ Release
INTERMEDIATE TREATMENTS										
Salvage										
Salvage Thinning	4049	115	0	**4164**	0	0	0	0	0	0
Total	**4049**	**115**	**0**	**4164**	**0**	**0**	**0**	**0**	**0**	**0**

Table 9. Alternative 2 - Proposed Transportation System Activities

ROAD SYSTEM ACTIVITIES (Miles)	Private	MA 2.0	MA 3.0	MA 6.1	MA 6.2	Total
New Construction	0.1	0.1	8.1	0	0	8.3
Road Reconstruction						
Existing Road Betterment	0.6	0.3	8.5	0	0	9.4
Existing Road Realignment	0	0	0.9	0	0	0.9
Existing Road Restoration	6.4	4.2	67.6	0	2.4	80.6
Total Road Reconstruction	7.0	4.5	77.0	0	2.4	90.9
Existing Road Decommissioning	0	0	5.2	0	0	5.2
Temporary Road/Long Skid	0	0	0	0	0	0
STONE PITS (Number of Pits)						
Existing Pit Expansion	0	1	27	0	0	28
New Pit Development	0	2	6	0	0	8

ALTERNATIVE 3

Alternative 3 proposes reforestation and timber harvest activities that will promote forest ecosystem restoration in response to changes in vegetation that have occurred as a result of light to severe mortality and decline. This alternative initiates salvage regeneration harvest and reforestation prescriptions in areas of severe mortality only where transportation access currently is found. It proposes salvage thinnings in areas of light to moderate mortality only where transportation access is currently found. It also proposes only reforestation activity in stands that are severely impacted by mortality but no longer have commercially viable harvest options and in stands that are severely impacted by mortality, that have commercially viable harvest options but transportation access needed for commercial harvest is not found. Vegetation is managed primarily by using even-aged systems in MA 3.0 and 6.1, and uneven-aged systems in MA 2.0, per Forest Plan direction (Please see Table 5).

Alternative 3 also proposes vegetative management prescriptions and wildlife habitat enhancement activities that meet Forest Plan objectives for MA 2.0 and MA 3.0 in stands that are not impacted by mortality, where transportation access currently is found. Vegetation is managed primarily by using even-aged systems in MA 3.0, and uneven-aged systems in MA 2.0 per Forest Plan direction (Please see Table 5 and Table 7).

Alternative 3 proposes transportation system management that includes only the restoration of existing roads to provide access to support timber harvest, reforestation and wildlife habitat activities (Please see Table 6). Some long skids are proposed. No new road construction, road betterment or road realignment is proposed.

This alternative will generate a harvest volume of approximately 20 MMBF in the first entry and 23 MMBF in a second entry that will occur in 7-10 years (Please see Table 10).

Even-aged Regeneration Harvests

Even-aged regeneration harvest prescriptions include treatments that occur in stands that are severely impacted by tree mortality and decline, as well as healthier stands. Harvest treatments occur only in stands where existing transportation systems provide reasonable access. Reforestation treatments such as herbicide application, site preparation for natural regeneration, fertilization, area fencing, and planting are prescribed based upon site specific needs within a stand. The combination of timber harvest and reforestation activity results in the restoration and maintenance of forested stands, the establishment of vertical and horizontal vegetative diversity, the production of wood products, and the establishment of age class diversity across the landscape. Even-aged regeneration harvests are proposed only in MA 3.0 and MA 6.1.

Even-aged Thinning Harvests

Even-aged thinning prescriptions include treatments that occur in stands that are lightly to moderatley impacted by tree mortality and decline, as well as healthier stands where stocking levels are high. Harvest treatments occur only in stands where existing transportation systems provide reasonable access. These timber harvest activities are designed to maintain the health and vigor of stands and produce wood products. The objective of treatments will be to establish even-aged structure in these stands. Even-aged thinning harvests are proposed only in MA 3.0.

Reforestation Only

Reforestation treatments with no associated timber harvest occur in stands that are severely impacted by tree mortality and decline and where no opportunity for commercial timber harvest activity exists and is stands that are severly impacted by tree mortality and decline, where opportunity for commercial timber harvest does exist, but where existing transportation systems do not provide reasonable access. Reforestation treatments such as herbicide application, site preparation for natural regeneration, fertilization, area fencing and planting are prescribed based upon site specific needs within a stand. The application of reforestation treatments result in the restoration of forested stands, the establishment of vertical and horizontal diversity.

Uneven-aged Harvests

Uneven-aged harvest prescriptions include treatments that occur in stands that are severely impacted by tree mortality and decline, as well as healthier stands. Harvest treatments occur only in stands where existing transportation systems provide reasonable access. Reforestation treatments such as herbicide application, site preparation for natural regeneration, area fencing and planting are prescribed based upon site specific needs within a stand. The combination of timber harvest and reforestation activity results in the restoration and maintenance of forested stands, the establishment of vertical and horizontal vegetative diversity, the production of wood products, and the establishment of age-class diversity within individual stands. Uneven-aged regeneration harvests are proposed in MA 2.0, MA 3.0 and MA 6.1.

Release

Release treatments are proposed in 15 – 30 year old stands where species composition is dominated by species such as pin cherry or black birch. The release of more desirable, commercially valuable species such as black cherry, red maple and other hardwoods will result in forest type composition that achieves long term Forest Plan objectives. Release treatments are proposed in MA 2.0 and MA 3.0.

Wildlife Habitat Enhancements

Wildlife habitat improvement activities are proposed to increase species diversity in the project area by planting shrub and tree species that are absent or found in small amounts, to establish habitat components such as permanent openings, to promote the growth of existing trees and shrubs beneficial to wildlife. Wildife treatments are proposed in MA 2.0. MA 3.0 and MA 6.1.

Transportation Management

Transportation management activities include road reconstruction consisting only of road restoration, decommissioning of existing roads, expansion of existing stone pits and the development of new pits. Long skids are proposed in this alternative. Road reconstruction proposals occur on segments of roads that are needed to support vegetative management activities. These activities maintain the existing transportation system at a level that meets Forest Plan standards and guidelines, but does not provide access to support management opportunities that exist.

Table 10. Alternative 3 - Vegetation Treatments (acres)

Activity	MA 3.0	MA 2.0	MA 6.1	Total	Herbi-cide	Site Prep	Ferti-lize	Fence	Plant	TSI/ Release
EVEN-AGED REGENERATION HARVESTS										
Green										
Clearcut (includes 3 ac wildlife openings)	40	0	0	**40**	14	0	0	6	0	0
Shelterwood seed cut (1st entry)/Removal cut (2nd entry)	252	0	0	**252**	272	229	122	67	32	34
Shelterwood removal cut	29	0	0	**29**	9	3	44	25	9	44
Shelterwood removal cut (delay)	72	0	0	**72**	53	48	28	51	15	0
Prep cut/Two-aged	71	0	0	**71**	70	67	0	67	13	0
Reforestation treatments only	76	0	0	**76**	43	21	29	6	18	35
Salvage										
Clear-cut	84	0	0	**84**	78	84	84	39	39	0
Shelterwood seed cut (1st entry)/Removal cut (2nd entry)	1156	0	0	**1156**	1101	839	423	788	256	21
Shelterwood removal cut	58	0	0	**58**	6	25	41	5	5	0
Shelterwood removal cut (delayed)	470	0	0	**470**	469	370	179	367	97	82
Prep cut/Two-aged	32	0	0	**32**	32	32	0	0	0	0
Two- aged	130	0	0	**130**	129	117	0	78	35	0
Reforestation treatments only	270	60	90	**420**	411	390	124	298	57	0
INTERMEDIATE TREATMENTS										
Green										
Commercial Thinning	535	0	0	**535**	0	0	0	0	0	0
Salvage										
Salvage Thinning	1904	0	0	**1904**	5	1	0	5	5	0
UNEVEN-AGED										
Green										
Selection	14	63	0	**77**	43	68	0	43	43	63
Group Selection	0	154	0	**154**	127	154	0	25	0	154
Transition Cut	18	0	0	**18**	0	0	0	0	0	0
Salvage										
Selection	0	12	0	**12**	12	12	0	12	12	12
Group Selection	0	115	0	**115**	80	115	0	80	80	115
Total	**5211**	**404**	**90**	**5705**	**2954**	**2575**	**1074**	**1962**	**716**	**560**

Table 11. Alternative 3 - Proposed Transportation System Activities

ROAD SYSTEM ACTIVITIES (Miles)	Private	MA 2.0	MA 3.0	MA 6.1	MA 6.2	Total
New Construction	0	0	0	0	0	0
Road Reconstruction						
Existing Road Betterment	0	0	0	0	0	0
Existing Road Realignment	0	0	0	0	0	0
Existing Road Restoration	6.8	4.0	73.3	0.2	2.4	86.7
Total Road Reconstruction	6.8	4.0	73.3	0.2	2.4	86.7
Existing Road Decommissioning	0	0	2.0	0	0	2.0
Temporary Road/Long Skid	0	0	3.5	0	0	3.5
STONE PITS (Number of Pits)						
Existing Pit Expansion	0	1	25	0	0	26
New Pit Development	0	0	7	0	0	7

Table 12. Alternative 3 - Wildlife Treatments

Wildlife Treatments	MA	Acres
Create/Maintain Openings	3.0	2
Regenerate Aspen	3.0	92
Seeding	3.0	54
Planting	3.0	466
Planting	2.0	187
Planting	6.1	15
Fencing	3.0	43
Prune and Release Apple trees (108)	3.0	36
Release mast producing shrubs/trees	3.0	14
Conifer release	3.0	36
Nest Boxes	3.0	14
Catch basins and fish structures	3.0	9
Construct water holes	3.0	7

ALTERNATIVE 4

Alternative 4 proposes reforestation and timber harvest activities that will promote forest ecosystem restoration in response to changes in vegetation that have occurred as a result of light to severe mortality and decline through the use of uneven-aged management. Uneven-aged management treatments are proposed in stands where it is biologically feasible to expect that successful stand regeneration could occur. Salvage harvest treatments that remove only dead and dying trees are proposed in areas of light to moderate mortality where uneven-aged treatments are not feasible. Salvage harvest treatments that remove only dead and dying trees along with reforestation treatments are proposed in stands where severe mortality has occurred, viable commercial salvage opportunity exists, but stands lack the vegetative characteristics needed for uneven-aged management. Reforestation only treatments are proposed in stands where severe mortality has occurred and uneven-aged management is not biologically feasible. (Please see Table 13).

Alternative 4 also proposes vegetative management prescriptions and wildlife habitat enhancement activities that meet Forest Plan objectives for MA 2.0 and MA 3.0 in stands that are not impacted by mortality. Vegetation is managed primarily by using uneven-aged systems (Please see Table 13 and Table 15).

Alternative 4 proposes transportation system management that provides access to support timber harvest, reforestation and wildlife habitat activities (Please see Table 14).

Alternative 4 will generate a harvest volume of approximately 12 MMBF of timber.

Uneven-aged Harvests

Uneven-aged harvest prescriptions include treatments that occur in stands that are severely impacted by tree mortality and decline, as well as healthier stands. Reforestation treatments such as herbicide application, site preparation for natural regeneration, area fencing and planting are prescribed based upon site specific needs within a stand. The combination of timber harvest and reforestation activity results in the restoration and maintenance of forested stands, the establishment of vertical and horizontal vegetative diversity, the production of wood products, and the establishment of age-class diversity within individual stands. Uneven-aged regeneration harvests are proposed in MA 2.0, MA 3.0 and MA 6.1.

Uneven-aged treatments are proposed on:

- All those stands proposed for uneven-aged treatments in Alternative 1
- Stands that have potential seed source for shade tolerant regeneration (35 BA of hemlock, beech, sugar maple)
- Stands that have adequately established, shade tolerant regeneration.

Salvage Thinning Harvests

The objective of these treatments in this alternative is designed to achieve neither even-aged nor uneven-aged structure – the objective is only to remove the dead and dying trees while commercial value still exists in order to recover the volume that would otherwise be lost.

In areas where safety concerns or visual concerns exist, dead and dying trees may be removed non-commercially.

Salvage Thinning Harvests with Reforestation Treatments

Salvage harvest treatments that remove only dead and dying trees along with reforestation treatments are proposed in stands where severe mortality has occurred, viable commercial salvage opportunity exists, but stands lack the vegetative characteristics needed for uneven-aged management. The combination of timber harvest and reforestation activity results in the restoration and maintenance of forested stands, the establishment of vertical and horizontal vegetative diversity, the production of wood products, and the establishment of age-class diversity across the landscape.

Reforestation Only

Reforestation treatments with no associated timber harvest occur in stands that are severely impacted by tree mortality and decline and where no opportunity for commercial timber harvest activity exists. Reforestation treatments such as herbicide application, site preparation for natural regeneration, fertilization, area fencing and planting are prescribed based upon site specific needs within a stand. The application of reforestation treatments result in the restoration of forested stands, the establishment of vertical and horizontal diversity and the establishment of age-class diversity across the landscape.

Release

Release treatments are proposed in 15 – 30 year old stands where species composition is dominated by species such as pin cherry or black birch. The release of more desirable, commercially valuable species such as black cherry, red maple and other hardwoods will result in forest type composition that achieves long term Forest Plan objectives. Release treatments are proposed in MA 2.0 and MA 3.0.

Wildlife Habitat Enhancements

Wildlife habitat improvement activities are proposed to increase species diversity in the project area by planting shrub and tree species that are absent or found in small amounts, to establish habitat components such as permanent openings, to promote the growth of existing trees and shrubs beneficial to wildlife. Wildife treatments are proposed in MA 2.0. MA 3.0 and MA 6.1.

Transportation Management

Transportation management activities include road construction, road reconstruction (including betterment, re-alignment and restoration), decommissioning of existing roads, expansion of existing stone pits and the development of new pits. Road construction and reconstruction proposals occur on segments of roads that are needed to support vegetative management activities. No long skids are proposed. These activities provide transportation systems that are adequate to support the management activities on National Forest lands.

Table 13. Alternative 4 - Vegetation Treatments (acres)

Activity	MA 3.0	MA 2.0	MA 6.1	Total	Herbicide	Site Prep	Fertilize	Fence	Plant	TSI/ Release
INTERMEDIATE TREATMENTS										
Salvage										
Salvage thinning	2456	0	0	**2456**	937	753	0	536	128	30
UNEVEN-AGED										
Green										
Selection	792	63	0	**855**	386	349	0	43	43	63
Group Selection	0	154	0	**154**	127	154	0	0	0	154
Salvage										
Selection	1707	12	0	**1719**	842	967	0	20	33	12
Group Selection	0	115	0	**115**	80	115	0	47	47	115
Reforestation treatments only	493	60	90	**643**	596	459	0	391	51	35
Clearcut for wildlife openings	9	0	0	**9**						
Total	**5457**	**404**	**90**	**5951**	**2968**	**2797**	**0**	**1037**	**302**	**409**

Table 14. Alternative 4 - Proposed Transportation System Activities

ROAD SYSTEM ACTIVITIES (Miles)	Private	MA 2.0	MA 3.0	MA 6.1	MA 6.2	Total
New Construction	0.2	0.1	9.7	0	0	10.0
Road Reconstruction						
Existing Road Betterment	1.2	0.3	10.2	0	0	11.7
Existing Road Realignment	0.2	0	0.9	0	0	1.1
Existing Road Restoration	6.8	6.1	71.9	0	2.4	87.2
Total Road Reconstruction	8.2	6.4	83.0	0	2.4	100.0
Existing Road Decommissioning	0	0	5.2	0	0	5.2
Temporary Road/Long Skid	0	0	0	0	0	0
STONE PITS (Number of Pits)						
Existing Pit Expansion	0	1	32	0	0	33
New Pit Development	0	2	8	0	0	10

Table 15. Alternative 4 - Wildlife Treatments

Wildlife Treatments	MA	Acres
Create/Maintain Openings	3.0	2
Regenerate Aspen	3.0	92
Seeding	3.0	54
Planting	3.0	466
Planting	2.0	187
Planting	6.1	15
Fencing	3.0	43
Prune and Release Apple trees (108)	3.0	36
Release mast producing shrubs/trees	3.0	14
Conifer release	3.0	36
Nest Boxes	3.0	14
Catch basins and fish structures	3.0	9
Construct water holes	3.0	7

ALTERNATIVE 5: NO NEW FEDERAL ACTION

Alternative 5 proposed that no new federal action would occur within the project area. This No Action alternative is required by NEPA and serves as a baseline (reference point) against which to describe the environmental effects of the action alternatives. Activities approved in previous NEPA decisions would continue to be implemented. This is a viable alternative and responds to the concerns of those who want no management activities to take place (e.g., no timber harvest, no additional roads, no herbicide application, no fencing, etc.).

There are no management activities proposed in Alternative 5 that would promote the restoration or maintenance of forested ecosystems in the project area, restore vertical or horizontal vegetative diversity, or maintain the health and vigor of stands where stocking levels are high. No timber harvest that would contribute towards people's demand for wood products would occur. Wildlife habitat enhancement activities would not be implemented. Ecological processes would relied upon for the establishment of seedlings and maintenance of forest cover in an environment where the understory vegetation in forested stands is dominated by vegetation that inhibits the establishment and growth of tree seedlings.

POTENTIAL IMPACTS TO PETS SPECIES

Timber rattlesnake - All known timber rattlesnake dens and sightings are recorded at the Ranger District offices and reported in the annual monitoring and evaluation report. Impacts to timber rattlesnakes could occur if skidders or logging vehicles are operating while these snakes are hunting, basking, or moving throughout the area. The following stands contain known or potential rattlesnake denning areas characterized by large surface boulders.

Compartment 854, Stand 35

Compartment 701, Stands 17 & 22

Compartment 684, Stands 11 & 14

Compartment 700, Stand 89

Compartment 712, Stand 19

The following mitigation measures apply to these stands:

1. The wildlife biologist will delineate a line around the boulder area to protect the integrity of the denning site. Within this denning site no road construction or motorized trail construction will be permitted.

2. In order to minimize potential harm to rattlesnakes during logging these sites will be logged between September 1st and April 1st. All skidding and logging operations must avoid damage or movement of large surface rock and boulders to avoid damage to denning sites.

Bald eagle - Bald eagles are occassionally found perching along many of the larger streams within the project area such as Tionesta Creek and Salmon Creek. No nests have been found and no summer or winter roosts have been identified. None of the alternatives propose cutting trees on the shoreline of these larger streams so existing perch sites would remain available for eagle use. In the event that an eagle nest is built or a roost site discovered within the project area during the implementation of this project, the following standards and guidelines would be implemented immediately.

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 which are necessary to protect or monitor the nest.

    b. From January 15 to July 31 of each year, people and aircraft 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.

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 slpes along 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 supercanopy trees but also trees that may provide nesting or roosting sites in the future, such that a sustainable supply will be available.

4. When a tree containing an eagle nest has been blown down or has been damaged so it can no longer support a nest, once a new nest in a different location is established buffer zones may be removed. If a new nest is not established but large super-canopy trees remain within the 330-foot buffer zone of the old nest, maintain the original 330-foot zone through three breeding seasons to observe any attempts to rebuild a nest near the original location. After three years with no new nesting attempts the buffer zone can be removed.

5. When a nest structure disappears but the nest tree remains, the buffer zones should remain in effect through at least the following three breeding seasons. If the nest is not rebuilt, remove the zoning but still consider the area as important eagle habitat and protect accordingly.

6. 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.

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

No impacts to bald eagles are anticipated under any of the alternatives.

Yellow-bellied Flycatcher - Although the only known location of the yellow-bellied flycatcher on the ANF is within the project area, no treatments under any of the alternatives are near this known site. This known nesting location is within the 1985 tornado swath, characterized by dense saplings, and large woody debris with sphagnum moss on the forest floor. None of the alternatives propose timber harvest, road building or surface disturbing activities in this type of habitat. Therefore, the yellow-bellied flycatcher would not be impacted under any alternative.

Indiana bat

Direct Effects – Under Alternatives 1 – 4, timber harvest and other activities that involve the removal of trees, may result in direct mortality or injury to individual or small groups of roosting Indiana bats, when harvesting or removing trees that harbor undetected roosts (including occupied snags, live trees, shagbark hickories, or damaged or hollow trees) occurs. The likekihood of cutting a tree containing a maternity colony or individual roosting Indiana bat, however, is anticipated to be extremely low because of the large number of suitable roost trees present on the ANF, the rarity of the species, and the wide dispersal of Indiana bats and maternity colonies thoughout the species range (USDI-FWS 1999b, p. 46).

If a maternity colony or roosting individuals are present in a unit proposed for timber harvest or other activity that removes overstory trees, incidental take of Indiana bats could occur. However the potential for incidental take is reduced through implementation of new Forest Plan Standards and Guidelines as recommended by the Fish and Wildlife Service in the Biological Opinion. Harvest activities that occur when bats are away from the ANF (hibernating) do not have a direct effect (October 1 – March 31). The following mitigation measures will be applied to all stands to provide roosting and foraging habitat and to ensure that any incidental "take" of Indiana bats is minimized:

1. Retain all shagbark and shellbark hickories (live, dead, and dying), regardless of size, in partial and final harvest cutting units (green and salvage units). (Existing S&G)

2. 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.

3. For both partial and final harvests in salvage units (dead or dying trees make up 50 percent or more of the harvested volume), and clearcuts, 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 I live tree ≥20 inches d.b.h. per acre in final harvest units and clearcuts when available.

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

5. 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.

6. 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).

7. In order to minimize incidental take of roosting bats, 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. Such removal, however, will be as a last resort, after other alternatives (such as fencing the area, etc.) have been considered and deemed unacceptable.

8. Activities within a 1.5 mile radius of Indiana bat maternity sites shall be subject to further consultation. Such activities include those which may affect the Indiana bat or alter its habitat (e.g., by removing potential roost trees or altering percent canopy closure), such as timber harvesting, road construction, trail construction, and federal oil and gas development. In addition, if an Indiana bat maternity site is found on ANF, the Forest Service shall consult with FWS to determine/develop standards and guidelines and/or a conservation plan to protect and manage the site.

9. 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

No treatments are proposed in Alternative 5 and there are no direct or indirect short term effects resulting from this alternative. No timber harvest would take place, therefore harm or harrassment of individual bats would not occur.

Indirect Effects – Potential indirect effects include changes in Indiana bat habitat conditions at both the stand and landscape scale. Activities that will result in indirect effects, or changes in habitat conditions for the Indiana bat include all proposed timber harvest activities and some proposed wildlife habitat improvement work.. Although activities such as new road construction, reforestation treatments, and expansion of gravel pits will result in some removal of vegetation, these occur as either small inclusions within stands, or do not greatly alter crown closure on the affected site. As a result, these activities are not expected to alter habitat conditions within the affected stand to any great degree.

Timber Harvest

Timber harvest treatments are described in detail in Appendix B. Many of these treatments are expected to have similar indirect effects on Indiana bat habitat. In order to more clearly describe potential effects, timber treatments are placed in one of the following categories:

1. Regeneration Treatment – Regeneration harvest includes removal cutting, shelterwood removal cutting, and 2-age harvest. These treatments are all even-aged prescriptions and will involve regeneration of new tree seedlings in the entire stand being treated.

2. Partial Harvests – Partial harvest treatments include shelterwood harvest, thinning, and selection harvest. While some of these treatments do result in establishment of regeneration within the stand, a mature overstory will continue to dominate the stand under these treatments.

The following is a discussion of indirect effects of proposed timber harvest on Indiana bat habitat.

Partial Harvest – Partial harvest treatments are proposed on 6,612 acres, 4,220 acres, 4,277 acres, and 5,336 acres under Alternatives 1 – 4 respectively. These treatments will reduce the existing canopy closure on the site and will generally result in optimum crown closure conditions for Indiana bat roosting

and foraging. Optimum crown closure conditions will persist on the site until overstory crowns grow together usually three to five years.

Regeneration or Final Harvest – Even-aged final harvest treatments are proposed on 981 acres, 0 acres, 789 acres and 9 acres under Alternatives 1 – 4 respectively. Shelterwood removal harvest and removal cuts will result in removal of most of the mature overstory. This will result in an open canopy condition that is believed to be less than suitable for roosting and foraging. While 2-age harvest will also result in removal of most of the mature overstory, enough overstory trees will be retained to provide suitable roosting and foraging habitat (as defined by the HIS model).

Size Classes of Dead and Live Trees

Snags and dead trees are abundant on the sites proposed for treatment. An assessment of the present condition of the treatment areas indicates current numbers of dead and live trees exceed optimal requirements (see Tables 3 and 4). A substantial portion of these trees have been dead since 1994-1996.

Aside from black cherry which may hold some commercial value for several years after it dies, most of the dead species lose their commercial value within a year of their death. Consequently, many standing dead trees will not be harvested unless they present a safety hazard to forest users or equipment/personnel conducting the harvesting activity

Therefore, sufficient roosting habitat in the form of live and dead trees is provided under all alternatives.

Stand Level Changes – Stand specific changes in canopy closures that are anticipated under each alternative are included in the project file. Stand level Indiana bat habitat is evaluated by looking at specific changes in habitat conditions (roosting and foraging habitat, measured by crown closure), that would result under each alternative.

Many stands proposed for even-aged regeneration will receive two treatments, including a shelterwood harvest in the next 2 – 5 years, followed by a final harvest treatment (shelterwood removal cut or 2-age) in 5 - 7 years. Since the habitat conditions resulting from shelterwood treatments will be short term, the changes in habitat conditions evaluated here and included in the project are based upon the conditions that will result following the final harvest treatment.

While the uneven-aged harvests proposed under Alternative 4 will result in the removal of potential roost trees, all stands affected by this treatment will continue to provide sutitable Indiana bat habitat (as defined by the HIS model). Based on this model the seedling sapling stands that result under Alternatives 1 –3 , no longer meet the criteria for suitable maternity roost habitat or foraging habitat. However, there may be some positive management benefits for Indiana bats from proposed timber harvest. The retention of snags, den trees, and clumps will allow potential roost sites to be conserved and the opening up of the canopy and margins of the site being treated may increase the degree of exposure of some maternity roost trees to solar radiation, providing improved thermal conditions for raising young. The top Indiana bat experts have concluded in the Draft Indiana Bat Recovery Plan (USDI-FWS 1999a) that:

> "Primary roosts are located in openings or at the edge of forest stands, while alternate roosts can be in either the open or interior of forest stands. Thermoregulatory needs may be a factor in roost site selection. Primary roosts are not surrounded by closed canopy and can be warmed by solar radiation, thus providing a favorable microclimate for growth and development of young duiring normal weather. Alternative roosts tend to be more shaded, frequently are within forest stands, and are selected when temperatures are above normal or during periods of precipitation."

Research on Indiana bat foaging habitat has shown that Indiana bats forage in a variety of forest habitats. Indiana bats may forage along the edges of final harvest units, openings, and near clumps of overstory trees left in final harvest units (Romme et al 1995). Garner and Gardner (1992) found that Indiana bats prefer open areas such as cropland and old fields rather than forested uplands. The scientific literature

indicates that Indiana bats may forage in habitats with canopy closures ranging from 50 – 70 percent canopy closure most of the time, but landscapes with a variety of canopy closures are also utilized.

Landscape Level Changes – Landscape level changes and the availability of suitable roost trees across the project area must be considered, since management of an area for a perpetual supply of potential roost trees is much more important than trying to manage individual roost trees which may only possess roosting characteristics for a few years (Callahan et al. 1997, Clawson 1986, Kiser and Elliot 1996, Romme et al. 1995). Also assessment of landscape level changes help to determine if suitable habitat is adequately distributed across the project area and within the bat's home range.. The present condition and the changes in roosting and foraging habitat under each alternative over the long term are presented in Tables 16 and 17.

Long-term Indirect Effects – Long-term indirect effects are the effects of the proposed treatments under each alternative projected out 20 years to the year 2019. This time frame is used because it represents the time needed for all timber harvest treatments and follow-up reforestation treatments to be completed with noticeable on-the-ground results.

Roosting Habitat - Canopy Closure Criteria

Table 16 shows the long-term effect through 2019 of the proposed treatments on the Indiana bat roosting habitat in Alternatives 1 through 5 within the areas proposed for treatment. For habitat to be optimal on a landscape, a minimum of 30% forested land must meet the specifications for optimal habitat; to be considered suitable, the minimum is 5%.

Table 16. Alternative Treatment Area Indiana Bat Roost Habitat Outcomes (Acres in Year 2019)

		% of Total Stand Acres				
		Future - 2019				
Roost Habitat/ Canopy Closure *	**Present (1999) Acres**	**Present**	**Alt. 1**	**Alt. 2 & 5**	**Alt. 3**	**Alt. 4**
Less than suitable						
Seedling/sapling	123	1	36	1	28	1
0 - 53%	2,538	31	5	25	6	25
>80%	2,413	29	11	53	28	36
Optimal						
54 - 80%	3,149	39	48	21	38	38
Total	***8,223***	100	100	100	100	100

Indiana bat roosting habitat conditions presently are optimal on 39% of the treatment areas, well above the 30% minimum. Alternative 1 management provides the highest amount of optimal roosting habitat (48%) of all of the Alternatives, followed by Alternatives 3 and 4 at 38%. Alternatives 2 and 5 do not provide optimal conditions across the treatment areas as a whole since only 21% of the treatment areas would meet optimal maternity roosting requirements. In addition, Alternatives 2 and 5 represent a 50% reduction in optimal habitat from the present condition. These latter two alternatives do not appear to meet the intent of the ANF DEIS for Threatened and Endangered Species on the Allegheny National Forest (USDA-Forest Service, ANF, 2000), i.e., to maintain and enhance habitat on the ANF in order to ensure the continued existence of the Indiana bat.

Foraging Habitat - Canopy Closure Criteria

Table 17 shows the long-term effect through 2019 of the proposed treatments on the Indiana bat foraging habitat in Alternatives 1 through 5 within the areas proposed for treatment. As was the case for roosting, for foraging habitat to be optimal on a landscape, a minimum of 30% forested land must meet the specifications for optimal habitat; to be considered suitable, the minimum is 5%.

Table 17. Alternative Treatment Area Indiana Bat Forage Habitat Outcomes (Acres in Year 2019)

		% of Total Stand Acres				
		Future - 2019				
Forage Habitat/ Canopy Closure *	**Present (1999) Acres**	**Present**	**Alt. 1**	**Alt. 2 & 5**	**Alt. 3**	**Alt. 4**
Less than suitable						
Seedling/sapling	123	1	36	1	28	1
0 - 49%	2,110	26	5	16	5	16
>70%	3,737	46	32	64	42	54
Optimal						
50 - 70%	2,253	27	27	19	25	29
Total	***8,223***	100	100	100	100	100

Indiana bat foraging habitat conditions presently are optimal on 27% of the treatment areas, slightly below the 30% minimum. In 2019, the effect of Alternative 4 management on the proposed treatment areas, at 29% optimal conditions, comes the closest to meeting the threshhold for optimal, followed by Alternatives 1 and 3 at 27% and 25%, respectively. Alternatives 2 and 5 result in almost a one-third reduction of optimal habitat by 2019. As was the case for roosting habitat, these latter two alternatives do not appear to meet the intent of the ANF DEIS for Threatened and Endangered Species on the Allegheny National Forest (USDA-Forest Service, ANF, 2000), i.e., to maintain and enhance habitat on the ANF in order to ensure the continued existence of the Indiana bat. Although mitigation measures will minimize the likelihood of individual bats being harmed in specific stands proposed for treatment, Alternatives 2 and 5 will cause an adverse impact by not sustaining optimal canopy conditions over the long term.

Wildlife Habitat Improvement Work – Appendix C includes a detailed analysis of proposed wildlife habitat enhancements under each alternative. Although these enhancements are directed towards a variety of wildlife species, construction of 7 acres of water holes under Alternatives 1, 3, and 4 would benefit Indiana bats. Releasing 36 acres of apple trees and 14 acres of mast producing shrubs under alternatives 1, 3, and 4 may result in improved canopy conditions for foraging and roosting although Indiana bats are not the focus of these treatments. Creating openings would benefit many wildlife species but may result in less than suitable roosting and foraging habitat for Indiana bats. Opening creation occurs on a very small part of the project area (20 acres under Alternative 1) and is not expected to have any adverse effect on Indiana bats overall.

Northern Long-eared bat - Habitat use for the Northern long-eared bat appears to be similar to that of the Indiana bat. The exception may be that the Northern long-eared bat may use cavities in trees as maternity roosts more often than the Indiana bat. Also, Northern long-eared bats may hibernate in caves with warmer average temperatures than the Indiana bat. Until more is known, the effects described above for the Indiana bat also apply to the Northern long-eared bat. All alternatives provide sufficient roosting habitat in the form of live and dead trees. Canopy closure effects are discussed under cumulative effects.

Northern water shrew - Since water shrews travel along the stream bank diving into the water to catch aquatic insects and small fish, two important components of their habitat are the integrity of the streambank (vegetation, woody debris) and water quality (to support the prey base). Neither timber harvesting nor herbicide treatment impact the streambank vegetation and woody debris since buffer zones are employed to: (1) have average daily maximum stream temperatures less than or equal to 68 degrees farenheight in streams supporting cold-water communities; (2) provide a sufficient number of biologically mature trees growing along streams to provide for long-term input of large woody material; (3) provide habitat complexity, channel stability, and pool formation in cold water streams by managing for the recruitment and long-term maintenance of 75-380 pieces of instream large woody material per stream mile. For cool- and warm-water streams, manage for 75-200 pieces of instream large woody material per stream mile; and (4) maintain trees that provide streambank stabilty (USDA-FS 1986, amended in 1997, pages 4-19 and 4-19a). Furthermore, a 75-foot buffer is maintained along perennial streams and a 50-foot buffer is maintained along intermittent streams during herbicide application (USDA-FS 1986, pg 4-25).

Roads within 300 feet of a stream course may contribute sediment to the stream altering the physical habitat by embedding larger substrate, filling pools, and increasing turbidity. All of these can affect aquatic fauna and thus the food source of water shrews. The potential effects of road activities on water quality is discussed in the Water and Watersheds section in Chapter 4. Limestone surfacing is proposed for all sections of road within 300 feet of a stream (including stream crossings) that will be used for hauling timber. Limestone has been demonstrated as an effective mitigation to reduce sedimentation in streams.

In the Bear Creek watershed, where water shrews have been documented, all of the road activity will occur beyond 300 feet of any stream course and no stream crossings are proposed for use. The total miles of road in Eastside within 300 feet of a stream, with limestone and without limestone surfacing are displayed in Table 18.

Under Alternatives 1, 2, and 4, a total of 0.4 miles of new road construction would occur within 300 feet of a stream. This disturbance within potential habitat for the water shrew could potentially harm an individual water shrew but it is such a small part of the total potential habitat within the project area that it would not cause a downward trend in the population that would lead toward federal listing. No new road construction within 300 feet of a stream would occur under Alternatives 3 and 5.

Table 18. Miles of Road and Stream Crossings within 300 feet of a Stream by Alternative.

Miles Within 300'	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
Limestone	31	27.8	27.7	29.2	15.5
Non-limestone	55.1	57.6	58.4	55.7	70.9
Private/unknown	17.5/83.1	17.5/83.1	17.5/83.1	17.5/83.1	17.5/83.1
Stream Crossings	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt 4.**	**Alt. 5**
Limestone	56	56	53	57	29
Non-limestone	94	94	97	93	123
Private/unknown	49/179	49/179	49/179	49/179	49/179

The miles of road within 300 feet of a stream that would be obliterated under each alternative is presented in Table 19.

Table 19. Miles Of Road Within 300 Feet Of A Stream That Would Be Obliterated By Alternative

Alternative	Miles obliterated within 300' of stream
1	1.42
2	1.48
3	0.70
4	1.48
5	0

Road obliteration would eliminate sections of poorly designed road that are currently contributing sediment to streams. Obliteration plus the use of limestone would reduce sedimentation and improve habitat for water shrews. Alternatives 1, 2, and 4 would provide greater benefits to potential water shrew habitat than Alternatives 3 and 5.

Clubshell and Northern riffleshell mussels

Neither of these endangered mussels have been found within the project area. The project area does not include any of the National Forest lands that drain directly (unimpounded) into the Allegheny River. Therefore, there are no effects to these two mussels.

Dragonflies

Dragonflies would be most vulnerable to forest management activities if water quality was adversely affected or if riparian habitat was directly disturbed. Three of the nine sensitive dragonflies (Green faced clubtail, Rapids clubtail, and Mustached clubtail) do not occur within the project area so their riparian habitats would not be directly disturbed by proposed management activities. For the reasons provided under the water shrew (i.e. limestone surfacing of roads, road obliteration, buffer zones for herbicide treatments, and a maximum of only 0.4 miles of new road construction within 300 feet of a stream) water quality would be maintained in all streams flowing from the project area and these dragonflies would benefit.

The Harpoon clubtail, Midland clubtail, Ski-tailed emerald, Uhler's sundragon, Maine snaketail, and Zebra clubtail are found within the project area or down stream of the project area. None of the timber harvest treatments or herbicide treatments would occur in areas with standing water or on the immediate streambank. Although 0.4 miles of new road construction would occur within 300 feet of a stream under Alternatives 1, 2, and 4, this disturbance would not significantly affect the potential riparian habitat available for these dragonflies. The road obliteration planned under each alternative (see Table 18) would improve both water quality and riparian habitat conditions conditions in the long run. None of the alternatives are expected to have an adverse impact on any of the nine sensitive dragonflies.

Long-solid mussel

The Long-solid mussel has not been documented within the project area but is known to occur in Tionesta Creek down stream from the project area. Like other species of mussels, the Long-solid is sensitive to sedimentation and changes in water quality. As described for the water shrew and dragonflies, water quality will be maintained or improved and sedimentation will be controlled through measures such as limestone surfacing of roads within 300 feet of a stream used for timber hauling, obliteration of roads with the potential to cause sedimentation (Alternatives 1 through 4), and buffer zones for herbicide treatments. These measures have been shown to be effective (see Chapter 3 - Vegetation and Water sections) resulting in no adverse impact to the Long-solid mussel.

Small whorled pogonia

Despite more than 225,000 acres of survey for this threatened orchid, it has not be found on the ANF. Therefore, no impacts are anticipated from any of the alternatives.

Butternut

Butternut is found in scattered locations throughout the project area and is protected by the following Forest Plan standard:

When thinning, retain species which are minor components of a stand, particularly mast producers (Forest Plan page 4-6).

This standard will be applied to all vegetation treatments under Alternatives 1 through 4 and will state:

During all vegetation treatments, retain butternut and other minor components of a stand particularly hard and soft mast producers.

Some vegetation treatments may benefit butternut by creating better light conditions to promote regeneration. The following mitigation measure will be implemented under Alternatives 1 through 4 to promote regeneration of disease resistent butternuts:

Assess the tree to determine whether it has been affected by canker. If it is determined that the tree may be resistant, activities which promote seed germination, including release, seed-bed preparation, and fencing are to be implemented.

Weigand's sedge, Creeping snowberry, Thread rush, Rough cotton-grass

Of these four sensitive plants only Creeping snowberry was documented on the ANF during the 1989 wetland plant survey. This documented location is not in the project area. Surveys were conducted in wetland and riparian areas through out the project area in 1998 and 1999. None of these four species were found.

All of these species are usually found in bogs or wetlands; habitats where timber harvest and road construction are not conducted on the ANF. Thread rush and Creeping snowberry are sometimes found in riparian areas. However, these species have not been documented in any areas where timber harvest, herbicide application, other vegetation treatments, or road construction are planned under any of the alternatives. Therefore, none of these four species will be impacted under any of the alternatives.

Spotted darter, Tippecanoe darter, Gravel chub, Channel darter

These four fish have not been documented within the project area. High potential habitat for these four species is primarily found in the Allegheny River. Management activities proposed under all alternatives will not affect water quality and sedimentation in the Allegheny River. The 13 percent of the ANF that drains directly (unimpounded) into the Allegheny River is not within the project area. Therefore no impacts are anticipated to any of these four sensitive fish species under any alternative.

Longhead darter, Mountain brook lamprey, Gilt darter

High potential habitat for these three sensitive fish is found within the project area or downstream of the project area. Management activities that adversely affect water quality or increase sedimentation could potentially impact these species. However mitigation measures that protect water quality and reduce sedimentation (i.e. limestone surfacing of roads, road obliteration, buffer zones for herbicide treatments, and a maximum of only 0.4 miles of new road construction within 300 feet of a stream) will ensure that none of these species are impacted under any alternative.

CUMULATIVE EFFECTS

The following species have not been documented as occurring within the project area, therefore, no cumulative effects under any alternative will occur:

Clubshell mussel

Northern riffleshell mussel

Green faced clubtail

Rapids clubtail

Mustached clubtail

Small whorled pogonia

Weigand's sedge

Creeping snowberry

Thread rush

Rough cotton-grass

Spotted darter

Tippecanoe darter

Gravel chub

Channel darter

Several other species are known to inhabit the project area or occur down stream of the project area and depend on intact wetland or riparian systems with low sedimentation and the maintenance of water quality to ensure their continued survival and reproduction. Mitigation measures have been proposed to maintain water quality and reduce sedimentation such that no adverse cumulative effects will occur. To the contrary, the use of limestone surfacing on roads within 300 feet of a stream and the obliteration of roads producing sediment would lead to a long term beneficial cumulative effect under alternatives 1 through 4. For these reasons there would be no adverse cumulative effect to the species listed below under any alternative:

Northern water shrew

Long-solid mussel

Harpoon clubtail

Midland clubtail

Ski-tailed emerald

Uhler's sundragon

Maine snaketail

Zebra clubtail

Longhead darter

Mountain brook lamprey

Gilt darter

Indiana bat

Cumulative effects include the effects of past treatments and future treatments on both Forest Service and private lands. Future treatments are projected for 20 years. On Forest Service lands, the amount of future treatment is estimated based on continuation of levels of activity projected in the Biological Assessment (USDA-FS 1998) and used to estimate incidental take in the Biological Opinion (USDI-FWS 1999b). The estimated cumulative totals of past and future treatments for the East side project area projected out to 2019 are displayed in Table 20. Based on these projections the age class distribution within the East Side project area by 2019 is displayed in Table 21.

Table 20. East Side Project Area Cumulative Totals by Treatment

	Evaluation Area Acres	Past Forest Service Treatment 86-98	% of Project Area Treated 1986-1998, East Side Project, Current ANF and Private Twenty-year Plans				
			Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Final Harvest	153,240	9%	19%	18%	18%	18%	18%
Two-age	153,240	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Selection	153,240	2%	5%	4%	5%	6%	4%
Intermediate Thinning	153,240	11%	27%	26%	26%	26%	26%
Salvage Thinning	153,240	3%	5%	6%	5%	5%	3%
Planting	136,260	<1%	3%	3%	3%	3%	3%
Fencing	136,260	3%	12%	10%	12%	11%	10%
Herbicide	136,260	5%	21%	18%	20%	21%	18%

Table 21. Age Class Distribution for ANF Land within the Project Area - Projected to 2019 (as a percent of the 139,990 acres of ANF land)

Age Class	Present Condition Year 1999	Alt. 1 Year 2019	Alts. 2, 4 & 5 Year 2019	Alt 3 Year 2019
Openings (no age)	3%	3%	3%	3%
0-10 years	5%	4%	4%	4%
11-20 years	6%	8%	6%	7%
21-50 years	6%	16%	16%	16%
51-110 years	76%	44%	46%	45%
111+ years	3%	24%	25%	24%
Unknown	1%	1%	1%	1%

As described under indirect effects, roosting and foraging habitat would become less than suitable as final harvest treatments create seedling/sapling habitat in the 0 – 10 year age class. Although cumulative totals of final harvest treatments vary slightly between alternatives (Table 20) the cumulative effect for all alternatives is that 4 percent of the project area will be in the 0-10 year age class in 20 years (Table 21). Although the HIS model does not consider seedling/sapling habitat suitable for roosting or foraging, biologists recognize that some roosting and foraging may occur along the edges of these units and the clumps of trees dispersed throughout this habitat. Creating 4 percent of the forest in seedling/sapling

habitat to develop a diversity of new tree seedlings, is essential when considering the long term sustainability of eastern hardwood forests and the diversity of wildlife species.

Two-age management will be completed on 1130 acres under Alternative 1 and 1001 acres under Alternative 3 by the year 2019. Under Alternatives 2, 4, and 5, about 745 acres will receive a 2 age treatment by 2019. These two-age treatments will result in suitable or optimal Indiana bat roosting and foraging habitat depending upon the resulting canopy closure and how fast the tree crowns grow back together.

Partial harvests that include shelterwood seed cuts, thinnings, and uneven-age selection cuts will occur on 74,938 acres, 72,546 acres, 72,603 acres, 73,662 acres and 68,326 acres under Alternatives 1 through 5 respectively. In general, these treatments will provide optimum foraging and roosting habitat depending upon how quickly the tree crowns grow back together or when a final harvest follows. These partial harvest treatments occur in stands older than 50 years and will occur over a twenty year period, thus providing a continual supply of optimum roosting and foraging habitat that changes as new stands are cut and the canopy closes on older stands. Since the projected amount of partial harvest cuts that will occur in the future does not vary drastically from one alternative to the next, there will not be major differences in the cumulative amount of optimal habitat (and thus cumulative effects) between alternatives.

Northern long-eared bat - Although research on canopy conditions for Northern long-eared bats is scarce, it is believed to be similar to the Indiana bat. Therefore, the cumulative effects described for the Indiana bat are applicable to the Northern long-eared bat. The exception may be that because Northern long-eared bats are more plentiful than Indiana bats on the ANF, the changes in canopy conditions under alternatives 2 and 5 may not be as significant for the Northern long-eared bat.

Timber rattlesnake - Mitigation measures proposed to protect the integrity of rattlesnake denning sites will ensure that no cumulative effects occur to the timber rattler. Likewise mitigation measure to retain butternut and promote its regeneration will ensure that no cumulative effects occur to butternut.

Bald eagle - Currently, there are no known bald eagle nests or roost sites in the project area and no cumulative effects are expected. If bald eagles begin nesting or roosting in the project area, protection measures outlined in the Forest Plan will be implemented.

Yellow-bellied flycatcher - Yellow-bellied flycatchers are nesting within the project area in specialized habitat created by the 1985 tornado. No present or foreseeable future vegetation treatments are planned in or near this habitat. Therefore, no cumulative effects from any alternative are anticipated.

SUMMARY OF DETERMINATIONS

Timber rattlesnake - Alternatives 1-4 - May impact individuals but not likely to cause a trend toward federal listing. Alternative 5 - no adverse impact.

Bald eagle - Alternatives 1-5 - No adverse effects beyond those set forth in the Biological Opinion (USDI-FWS 1999).

Yellow-bellied flycatcher - No adverse impact under any alternative.

Indiana bat - Alternatives 1, 3, and 4 - no adverse effects beyond those set forth in the Biological Opinion (USDI-FWS 1999). Alternatives 2 and 5 - may affect due to long term loss of optimal canopy conditions

Northern Long-eared bat - Alternatives 1, 3, and 4 - no adverse impact. Alternatives 2 and 5 - may impact individuals and colonies due to loss of optimal canopy conditions, but would not cause a trend toward federal listing.

Northern water shew - Alternaives 1 - 4. May impact individuals but not likely to cause a trend toward federal listing. Alternative 5 - no adverse impact.

Clubshell mussel - no adverse affect under any alternative

Northern riffleshell mussel - no adverse affect under any alternative

Green faced clubtail - no adverse impact under any alternative

Long-solid mussel - no adverse impact under any alternative

Harpoon clubtail - no adverse impact under any alternative

Rapids clubtail - no adverse impact under any alternative

Mustached clubtail - no adverse impact under any alternative

Midland clubtail - no adverse impact under any alternative

Ski-tailed emerald - no adverse impact under any alternative

Uhler's sundragon - no adverse impact under any alternative

Maine snaketail - no adverse impact under any alternative

Zebra clubtail - no adverse impact under any alternative

Small whorled pogonia - no adverse affect under any alternative

Wiegand's sedge - no adverse impact under any alternative

Butternut - no adverse impact under any alternative

Creeping snowberry - no adverse impact under any alternative

Thread rush - no adverse impact under any alternative

Rough cotton-grass - no adverse impact under any alternative

Spotted darter - no adverse impact under any alternative

Tippecanoe darter - no adverse impact under any alternative

Longhead darter - no adverse impact under any alternative

Mountain brook lamprey - no adverse impact under any alternative

Gravel chub - no adverse impact under any alternative

Channel darter - no adverse impact under any alternative

Gilt darter - no adverse impact under any alternative

Prepared by: */S/ Brad B. Nelson* Date: *October 13, 2000*

LITERATURE CITED

Alerich, C. L. 1993. Forest Statistics for Pennsylvania - 1978 and 1989. Resource Bull. NE-126. Radnor, PA. USDA-FS, NE forest Experiment Station. 244 pp.

Andersen, J. K. 1975. Electrofishing from Hemlock Eddy to Linzua Dam. USDI, Fish and Wildlife Service (ELC-1606).

Barbour, R. W., and W.H. Davis. 1969. Bats of America. Lexington: Univ. Press of Kentucky. 286 pp.

Bier, C.W. 1994. A Survey of Shrews in the Allegheny National Forest, Pennsylvania. Western Pennsylvania Conservancy, Natural Science and Stewardship Department. Pittsburgh, PA. 42 pp.

Bier, C.W., J.E. Rawlins, R.L. Davidson, and D.P. Koenig. 1997. A Survey of Odonata and Unionidae Associated with Streams in the Allegheny National Forest. Western PA Conservancy. 133 pp.

Brack, V.,Jr. 1983. The nonhibernating ecology of bats in Indiana, with emphasis on the endangered Indiana bat, *Myotis sodalis*. Ph.D. thesis. West Lafayette: Purdue Univ., 280 pp.

Brauning, D.W. 1992. Atlas of Breeding Birds in Pennsylvania. Univ. Pittsburgh Press. Pittsburgh, PA. 484 pp.

Callahan, E. 1993. Indiana Bat Summer Habitat Requirements. M.S. Thesis. Univ Missouri, Columbia. 75 pp.

Callahan, E.V., R.D. Drobney, and R.L. Clawson. 1997. Selection of summer roosting sites by Indiana bats, *Myotis sodalis* in Missouri. J. Mamm. 78:818-825.

Clawson, R.L. 1986. An investigation of the summer distribution and status of Indiana bats in Missouri. Final Report. Federal Aid Project W-13-R, Fish and Willdife Res. Cen., Columbia, MO. 17 pp.

Cooper, E.L. 1983. Fishes of Pennsylvania and the Northeastern United States. Penn State. 243 pp.

Cooper, E.L. 1985. Spotted Darter. In Genoways, H.H. and F. J. Brenner. Species of Special Concern In Pennsylvania. Carnegie Museum of Natural History No. 11 Pittsburgh, PA 430 pp.

DeGraaf, R.M. and D.D. Rudis. 1986. New England Wildlife: Habitat, Natural History and Distribution. Gen. Tech. Rep. NE-108. Broomall, PA: U.S. Dept. of Agric., For. Serv. NE For. Exp. Station. 494 pp.

DeGraff, R.M., M.Y. Yamasaki, W.B.Leak, and J.W. Lanier. 1992. New England Wildlife: Management of Forested Habitats. NE Forest Experiment Station. Gen. Tech. Rpt. NE-144. Radnor, PA 271 pp.

Federal Register 1995. Final Rule to Reclassify the Bald Eagle from endangered to threatened in all of the lower 48 states. Vol 60. No 133. July 12, 1995.

Gannon, M. 1999. Survey of Bats at the Allegheny National Forest with Emphasis on the Indiana Bat (Myotis sodalis), preliminary report. unpublished.

Gardner, J.E., J.D. Garner and J.E. Hofmann. 1991. Summer roost selection and roosting behavior of Myotis sodalis in Illinois. Final Report prepared for Endangered Species Office, Region 3, USDI-Fish and Wildlife Service, Twin Cities, Minn. 56 pp.

Garner, J.D. and J.E. Gardner 1992. Determination of summer distribution and habitat utilization of the Indiana bat *Myotis sodalis* in Illinois. Trans Illinois State Acad. Sci. 89:187-196.

Genoways, H.H. and F.J. Brenner. 1985. Species of Special Concern in Pennsylvania. Carnage Museum of Natural History. Special Publication No 11. Pittsburgh, PA 430 pp.

Hart, J.A., J. Hassinger, and C. Butchkowski. 1997. An update on the status of cave-dwelling bats in Pennsylvania. PA Chapter, The Wildlife Society, Annual Mtg. Dawson, PA.

Hassinger, J. and C. Butchkowski. 1998.Lactating Indiana bats *Myotis sodalis* found in Pennsylvania Represent Three "Firsts". 54th Annual Northeast Fish and Wildlife Conference, Camp Hill, PA.

Hobson, C.S. 1993. Status, distribution, and summer ecology of bats in Western Virginia: A survey for the endangered Indiana bat, *Myotis sodalis*, Report to Virginia Dept. of Game & Inland Fisheries, Non-game Division. Rishmond, VA. 18 pp.

Hobson, C.S. and J.N. Holland. 1995. Post-hibernation movement and foraging habitat of a male Indiana bat, *Myotis sodalis* in Western Virginia. Brimleyana 23:95-101.

Hubbs, C.L., and W.R. Crowe. 1956. Preliminary analysis of the American Cyprinid fishes, seven new, referred to the genus *Hybopsis*, subgenus *Erimystax*. Pages 423-424 in W.B. Scott and E.J.Crossman. 1973. Freshwater Fishes of Canada. Information Canada, 966 pp.

Humphrey, S., A. Richter, and J. Cope. 1977. Summer habitat and ecology of the endangered Indiana bat, *Myotis sodalis*. J. Mammal. 58:334-346.

Indiana Bat Recovery Team. 1996. Technical Draft Indiana Bat Recovery Plan. unpublished.

Kiser, J.D. and J.R. MacGregor. 1997. Fall prehibernation Indiana bat roost tree use on the Daniel Boone NF. Unpulbished rpt.

Kiser, J.D. and C.L. Elliott. 1996. Foraging habitat, food habits, and roost tree characteristics of the Indiana bat *Myotis sodalis* during autumn in Jackson County, Kentucky. Kentucky Dept. of Fish and Wildlife Resources, Frankfort, KY. 65 pp.

Kurta, A., D. King, J.A. Teramino, J.M. Stribley and K.J. Williams. 1993. Summer roosts of the endangered Indiana bat *Myotis sodalis* on the northen edge of its range. The American Midland Naturalist. 129 pp.

Kurta, A., K.J. Williams and R. Mies. 1996. Ecological, Behavioral, and Thermal Observations of a Peripheral Population of Indiana Bats *Myotis sodalis* in Barclay, R.M. and R.M. Brigham (ed). Bats and Forests Symposium. Victoria, B.C. Canada.

Lee, R. 1971. Survey of the Allegheny River near Tidioute, PA PA Fish and Boat Commission (ELC-1507).

Lee, R. 1975. Allegheny River Survey - Final Report. PA Fish and Boat Commission for the USDI-Fish and Wildlife Service, Project # F-39-R. 156 pp.

Merritt, J.E. 1987. Guide to the Mammals of Pennsylvania. Univ. of Pittsburgh Press, Pittsburgh, PA 408 pp.

Merritt, R.W. and K.W. Cummins. 1996. An Introduction to the Aquatic Insects of North America. Kendall/Hunt Publishing Co. Dubuque, Iowa. 862 pp.

Miller, N.E. 1996. Indiana bat summer habitat patterns in Northern Missouri. Thesis. Univ. Missouri, Columbia. 60 pp.

Ostlie, W.R. 1990. Stewardship Abstracts for Wiegand's Sedge and Darlington's Spruge. unpublished.

Ostry, M.E., Mielke, M.E. and Skilling, D.D. 1994. Butternut-Strategies for Managing a Threatened Tree. Gen. Tech. Rep. NC-165. St. Paul, NM: U.S. Dept. of Agric. Forest Service, North Central Exp. Station. 7 pp.

Page, L.M. 1983. Handbook of Darters. T.F.H. Publications, 271 pp.

Pennsylvania Game Commission. 1999. Bald Eagle and Osprey Report, Northwest Region. unpublished.

Pennsylvania Game Commission. 1995. Indiana Bat Hibernaculum Surveys. unpublished.

Rhoads, A. F., and W.M. Klein, Jr. 1993. The Vascular Flora of Pennsylvania. American Philosophical Society. Philadelphia, PA 636 pp.

Ricciardi, A., F.G. Whoriskey, and J.B. Rasmussen. 1996. Impact of the *Dreissena* Invasion on Native Unionid Bivalves in the Upper St. Lawrence River. Canadian Journal of Fisheries and Aquatic Sciences 53:1434-1444.

Romme, R., K. Tyrell, and V. Brack, Jr. 1995. Literature summary and habitat suitability Index Model: Components of summer habitat for the Indiana bat *Myotis sodalis.* 3D/Environmental, Cincinnati, Ohio.

Rink, G. 1990 In Ostrey, M.E., Mielke, M.E., Skilling, D.D. 1994. Butternut-Strategies for Managing A Threatened Tree. Gen Tech. Rep. NC-165. St. Paul, MN: U.S. Dept. of Agric. Forest Service, North Central Exp. Sta. 7 pp.

Sasse, D.B. and P.J. Pekins. 1996. Summer Roosting Ecology of Northern Long-eared Bats (Myotis septentrionalis) in the White Mountain National Forest. In Proceedings of Bats and Forests Symposium, R.M.R. Barclay and R.M. Brigham editors. Victoria, British Columbia. pgs. 91-101.

Shaffer, L. L. 1991. Pennsylvania Amphibians and Reptiles. PA Fish and Boat Commission. Harrisburg, PA. 161 pp.

USDA-FS. 1986. Allegheny National Forest Land and Resource Mangement Plan. Warren, PA.

USDA-FS. 1993. Allegheny National Forest Annual Monitoring Report. Warren, PA.

USDA-FS. 1998. Biological Assessment For Threatened and Endangered Species on the ANF. 86 pp.

USDA-FS. 2000. Final Environmental Impact Statement for Threatened and Endangered Species on the Allegheny National Forest. Warren, PA. 124 pp.

USDI-FWS. 1983. Recovery Plan for the Indiana Bat. Washington D.C. 80 pp.

USDI-FWS. 1958-1974. Boccardy, J.A. 1958-74, Cooper, E.L. 1958-1974, E.L. Cooper 1966-71. Individual surveys of selected fish in Western PA.

USDI-FWS. 1996. Indiana bat (Technical Draft) Recovery Plan. 37 pp.

USDI-FWS. 1999a. Draft Recovery Plan for the Indiana Bat.

USDI-FWS. 1999b. Biological Opinion on the Impacts of Forest Management and Other Activities to the Bald Eagle, Indiana Bat, Clubshell and Northern Riffleshell on the ANF. 99 pp.

Watters, G. T. 1993. Clubshell and Northern Riffleshell Recovery Plan. 1993. USDI-FWS. Hadley, Mass. 55 pp.

Western Pennsylvania Conservancy. 1989a. Allegheny National Forest Wetland Rare plant survey. Western Pennsylvania Conservancy, Pittsburgh, PA 67 pp.

Western Pennsylvania Conservancy. 1989b. Allegheny River Wilderness Islands Mussel Survey. Western Pennsylvania Conservancy, Pittsburgh, PA 13 pp.

Western Pennsylvania Conservancy and Carnegie Museum of Natural History. 1994. A Survey of the Dragonflies and Damselflies of the Clarion River and its Tributaries. 89 pp.

Widlak, J.C. 1997. Biological Opinion on the Impacts of Forest Management and other activities to the Indiana bat on the Cherokee National Forest, Tennessee. USFWS Ecological Services Office Cookeville, TN.

Wild Resource Conservation Fund. 1995. Endangered and Threatened Species of Pennsylvania. Harrisburg, PA. 80pp.

Williams, C.E. 1994. Inventory of Special Concern Plants and Unique Natural Communities: Clarion River and Mill Creek Corridors, Northwestern Pennsylvania. Clarion Univ., Clarion, PA. 47 pp.

Wrigley, R.E., J.E. Dubois, and H.W. Copeland. 1979. Habitat, Abundance and Distribution of Six Species of Shrews in Manitoba. J. of Mammalogy. 60(3):505-520.

Woomer, A. and R. Lee. 1991. Chappel Fork (216B) Management Report. PFBC. 11 pp.

Woomer, A. and R. Lee. 1994. Kinzua Creek, S. Branch (216B) Management Report. PFBC. 13 pp.

PERSONAL COMMUNICATION

Charles Bier, Naturalist, Western Pennsylvania Conservancy

Dave deCalesta, Research Wildlife Biologist, Northeastern Research Station, USDA-FS

Douglas Gross, Ornithologist, Ecology III

Jerry Hassinger, Nongame Biologist, Pennsylvania Game Commission

Brenda Peebles, Wildlife Techician, Eagle Project, Pennsylvania Game Commission

Paul Nickerson, Endangered Species Biologist, USDI Fish and Wildlife Service

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

EAST SIDE PROJECT
WILDLIFE REPORT/TREATMENTS

EAST SIDE WILDLIFE REPORT AND TREATMENTS

Method of Analysis

The analysis of the wildlife resource is done using a combination of three basic strategies. These include 1) the coarse filter approach, which is used to identify plant and associated wildlife communities across the watershed. This approach assumes that if the species, genetics, functions and processes are monitored and protected at the community level, than the bulk of the biotic species, both known and unknown, will also be protected, 2) the second strategy is the management indicator species approach. This approach is used to reduce the complexity of discussing all the wildlife species on the forest. Groups of wildlife associated with vegetative communities or key habitat components have been identified and selected as management indicators. Potential effects of proposed actions on wildlife are then evaluated by monitoring habitat changes of the selected indicator species, and 3) the third strategy, or fine filter approach is used to assess habitat and effects on threatened, endangered and sensitive species, as well as on unique or uncommon communities such as riparian areas, wetlands and areas of rock outcroppings or concentrated spring seeps. A fine filter approach is used on these resources, since effects may not be apparent using the coarse filter or MIS approach.

In addition, existing habitat is examined to ensure that it is adequate to support local populations of wildlife and for opportunities to enhance or create habitat. The following procedures are used to determine the need for habitat restoration or creation.

Conduct project level surveys - Field surveys were conducted to collect information related to vegetative and wildlife communities in the project area. This survey work has included the following: 1) a compartment examination survey was conducted for all compartments within the watershed. This included identification of unique within stand features and collection of overstory and understory information necessary to evaluate wildlife habitat conditions; 2) stands within the project area being considered for management received field review(s) by a wildlife biologist and/or biological technician to identify unique wildlife and plant communities or habitats and to help identify wildlife needs; 3) raptor nest searches have been conducted repeatedly and stands proposed for treatment received leaf-off surveys, as well as surveys during the breeding season; 4) Small whorled pogonia surveys were conducted on all areas proposed for treatment, as well as in portions of the watershed where suitable small whorled pogonia site conditions exist; and 5) stream surveys were conducted to evaluate effects of roads and OGM on all streams and look for improvement opportunities.

Identify present wildlife habitat conditions - From data collected, maps are created to identify and describe forested and non-forested communities, specialized habitats or habitat inclusions, management emphasis areas or areas of special concern. This information is also used to describe the wildlife present conditions, identify the wildlife purpose and need and to identify wildlife habitat improvement work proposed. Distribution of wildlife communities is given consideration during planning and for proposals for creation of herbaceous openings, ponds or mast producing shrub plantings.

Area Evaluated

The area evaluated in this report includes approximately 140,000 acres of National Forest System Lands located in the East Side Project Area which is predominantly second and third growth forest. The East Side project area was evaluated by sub-watersheds (watershed). Table 22 summarizes the present condition of wildlife habitat based on vegetation age class, and Tables 23 - 25 display summaries of habitat improvement proposals for each alternative.

Table 22. Wildlife Habitat Communities

	HABITAT COMPONENT	Present Condition
	Forested Size Class	
Salmon Creek	• Seedling (0-10 yrs)	508
Sub-Watershed	• Sapling (11-20 yrs)	267
	• Sawtimber (51+ yrs)	8,041
	Non-Forested Cover Types	
	• Grass/Forb	595
The Branch	**Forested Size Class**	
Sub-Watershed	• Seedling (0-10 yrs)	484
	• Sapling (11-20 yrs)	536
	• Sawtimber (51+ yrs)	5,731
	Non-Forested Cover Types	
	• Grass/Forb	640
	Forested Size Class	
Spring Creek	• Seedling (0-10 yrs)	591
Watershed	• Sapling (11-20 yrs)	764
	• Sawtimber (51+ yrs)	10,680
	Non-Forested Cover Types	
	• Grass/Forb	443
	Forested Size Class	
Bear Creek	• Seedling (0-10 yrs)	1,155
Watershed	• Sapling (11-20 yrs)	635
	• Sawtimber (51+ yrs)	12,766
	Non-Forested Cover Types	
	• Grass/Forb	414
South Branch of	**Forested Size Class**	
Tionesta Creek	• Seedling (0-10 yrs)	684
Watershed	• Sapling (11-20 yrs)	2,003
	• Sawtimber (51+ yrs)	13,830
	Non-Forested Cover Types	
	• Grass/Forb	252
Thomas Run	**Forested Size Class**	
Sub-Watershed	• Seedling (0-10 yrs)	0
	• Sapling (11-20 yrs)	375
	• Sawtimber (51+ yrs)	2,476
	Non-Forested Cover Types	
	• Grass/Forb	83
West Branch of	**Forested Size Class**	
Tionesta Creek	• Seedling (0-10 yrs)	92
Watershed	• Sapling (11-20 yrs)	268
	• Sawtimber (51+ yrs)	5,648
	Non-Forested Cover Types	
	• Grass/Forb	172
	Forested Size Class	
Buck Lick	• Seedling (0-10 yrs)	207
Sub-Watershed	• Sapling (11-20 yrs)	309
	• Sawtimber (51+ yrs)	3,399
	Non-Forested Cover Types	
	• Grass/Forb	23

	HABITAT COMPONENT	Present Condition
Kinzua Creek	**Forested Size Class**	
Watershed (upper)	• Seedling (0-10 yrs)	216
	• Sapling (11-20 yrs)	150
	• Sawtimber (51+ yrs)	4,230
	Non-Forested Cover Types	
	• Grass/Forb	342
Kinzua Creek	**Forested Size Class**	
Watershed (middle)	• Seedling (0-10 yrs)	578
	• Sapling (11-20 yrs)	371
	• Sawtimber (51+ yrs)	6,979
	Non-Forested Cover Types	
	• Grass/Forb	303
	Forested Size Class	
Tionesta Creek	• Seedling (0-10 yrs)	86
Watershed	• Sapling (11-20 yrs)	82
	• Sawtimber (51+ yrs)	2,399
	Non-Forested Cover Types	
	• Grass/Forb	63

Table 23. Wildlife Treatments by Alternative (In Acres) MA 3.0

Treatment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Create opening (associated with commercial clearcut)	18	0	3	8	0
Create opening (doze, seed and fertilize)	2	0	2	2	0
Regenerate aspen	92	0	92	92	0
Seeding	54	0	54	54	0
Planting	466	0	466	466	0
Fencing	43	0	43	43	0
Prune and Release Apple Trees (108 trees)	36	0	36	36	0
Release mast producing shrubs/trees	14	0	14	14	0
Conifer Release	36	0	36	36	0
Nest boxes	14	0	14	14	0
Catch Basins and Fish Structures	9	0	9	9	0
Construct water holes	7	0	7	7	0

Table 24. Wildlife Treatments by Alternative (In Acres) MA 2.0

TREATMENT	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Planting	187	0	187	187	0

Table 25. Wildlife Treatments by Alternative (In Acres) MA 6.1

TREATMENT	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Planting	15	0	15	15	0

Table 26 summarizes wildlife project proposals for individual stands and gives a brief Project description.

Table 26. Wildlife Project Proposals

Sale Name	Comp.	Stand	Acres/ Ma	Project Description
Windfall	484	52	10/2	Native Conifer and Shrub Planting
Windfall	484	33	10/2	Native Shrub Planting
Windfall	484	29	18/2	Native Conifer and Shrub Planting
Windfall	484	44	15/2	Native Conifer and Shrub Planting
Windfall	484	31	15/2	Native Conifer and Shrub Planting
Windfall	484	8	18/2	Native Conifer and Shrub Planting
Windfall	484	15	10/2	Native Shrub Planting
Windfall	484	43	10/2	Native Conifer and Shrub Planting
Windfall	484	45	10/2	Native Conifer and Shrub Planting
Windfall	484	30	10/2	Native Conifer and Shrub Planting
Windfall	484	49	10/2	Native Conifer and Shrub Planting
Windfall	484	48	10/2	Native Conifer and Shrub Planting
Windfall	484	47	10/2	Native Conifer Planting
Windfall	484	46	16/2	Native Conifer and Shrub Planting
Windfall	484	5	15/2	Native Conifer and Shrub Planting
Windfall	485	25	10/3	Native Conifer and Shrub Planting
Windfall	485	28	20/3	Native Conifer and Shrub Planting
Too late Sal.	492	20	15/6.1	Native Conifer and Shrub Planting
next entry	445	5	5/3	Native Conifer Planting
next entry	445	9	20/3	Native Conifer and Shrub Planting
next entry	445	14	5/3	Native Conifer Planting
next entry	445	16	18/3	Native Conifer and Shrub Planting
next entry	445	10	5/3	Native Conifer Planting
Sugar Run Sal.	440	19	16/3	Native Conifer and Shrub Planting
Sugar Run Sal.	440	40	10/3	Native Conifer and Shrub Planting
Sugar Run Sal.	439	41	10/3	Native Shrub Planting
Sugar Run Sal.	439	13	16/3	Native Conifer and Shrub Planting
Coal Mine Highup	801	33	5/3	Collect Ilex seeds
Coal Mine/HU	801	37	4/3	Plant Aspen, or oak, cuc,yp 100/acre w/tubes
Coal Mine/HU	801	17	4/3	Plant Aspen, or oak, cuc,yp 100/acre w/tubes
Coal Mine/HU	801	17	1/3	Prune and release 2 existing apple trees
Coal Mine/HU[1]	801	40	1/3	Create upland opening and seed. Alt. 1 only
Coal Mine/HU	801	32	1/3	Plant hawthorne or crabapple 50/acre w/tubes
Coal Mine/HU	801	45	1/3	Plant hawthorne or crabapple 75/acre w/tubes
Coal Mine East View	816	4	4/3	Unit fence or cribs on existing hobblebush
Coal Mine/EV	816	4	1/3	Prune and release 2 apple trees
Coal Mine/EV	816	4	2/3	Release hemlock
Coal Mine/EV	816	19	3/3	Construct catch basins
Coal Mine/EV	816	43	2/3	Plant viburnums, hawthorne or crabapple w/tubes or cribs
Coal Mine/EV	816	21	4/3	E. - 150 sumac W.- 275 sumac and oak S. - 200 sumac and oak
Coal Mine/EV	816	21	23/3	Thin larch stand to maintain species. Approx. 1 out of 3

[1] ***To occur with a commercial cut.***

Sale Name	Comp.	Stand	Acres/ Ma	Project Description
Coal Mine/EV	816	21	4/3	625 tubes
Coal Mine/EV	816	21	1/3	Expand existing opening to the east; seed with warm season grasses
Coal Mine/EV	816	62	1/3	Build water hole in pit
Coal Mine/EV	816	62	2/3	Tube existing shrub/tree on pit side
Coal Mine/EV	816	31	3/3	Plant 100 spruce
Coal Mine/EV	816	65	4/3	Release pine/prune damage
Coal Mine/EV	816	65	4/3	Plant fruit producing shrubs and cover i.e. laurel w/unit fences 10/acre
Coal Mine/EV	816	88	2/3	Tube 200 aspen
Coal Mine/EV	816	17	3/3	Construct catch basins
Coal Mine/EV	816	17	3/3	Plant 300 white pine and 75 hawthorne or crabapple. Tube 75 hawthorne or crab
Coal Mine/EV	816	17	2/3	Regenerate Aspen by chainsaw/dozer
Coal Mine/EV	816	89	1/3	Plant 175 spruce in existing opening
Coal Mine/EV	816	89	3/3	Regenerate Aspen by chainsaw/dozer
Coal Mine/EV	816	89	8/3	Plant and tube 200/acre Aspen (if needed)
Coal Mine/EV	816	19	1/3	Tube existing shrubs
Coal Mine/EV	816	23	1/3	Prune and Release Apple trees
Coal Mine/EV	816	36	5/3	Fence native hobblebush
Coal Mine/EV[1]	816	74	2/3	Regenerate Aspen by chainsaw cut
Coal Mine/EV	816	74	2/3	Plant and tube 200/acre Aspen (if needed)
Coal Mine/EV	816	20	1 each/3	Place purple martin nest box
Coal Mine/EV	816	76	5/3	Fence native hobblebush
Coal Mine/EV	816	20	8 each/3	Place bluebird nest boxes
Coal Mine/EV	816	20	3 each/3	Construct vernal ponds
Coal Mine/EV	816	20	6/3	Regenerate Aspen by chainsaw/dozer (2 sites)
Coal Mine/EV	816	20	6/3	Plant 200/acre Aspen and tube (if needed)
Coal Mine/EV	816	20	3/3	Release mast trees (juneberry, viburnums)
Coal Mine/EV	816	20	3/3	Plant wh. pine and spruce at perimeter
Coal Mine/EV	816	20	3/3	Plant aspen/stream side
Coal Mine/EV	816	20	3/3	Plant hawthorne, crabapple and apple w/ unit fences or cribs (drier sites)
Coal Mine/EV	816	20	2/3	Plant cranberry, blueberry, arrowwood (wet sites)
Coal Mine/EV	816	23	4/3	Regenerate Aspen by chainsaw/dozer
Coal Mine/EV	816	23	4/3	Plant 200/acre Aspen and tube (if needed)
Coal Mine/EV	816	74	1/3	Regenerate Aspen by chainsaw/dozer
Coal Mine Top Side	817	14	1/3	Plant 50 cranberry or blueberry in 3 cribs
Coal Mine/TS	817	14	1/3	Plant 100 Aspen/tubes
Coal Mine/TS	817	14	3/3	Plant 150 white pine/acre
Coal Mine/TS	817	14	3/3	Release scattered spruce
Coal Mine/TS	817	14	1/3	Regenerate Aspen by chainsaw/dozer
Coal Mine/TS	817	14	1/3	Plant 200/acre Aspen and tube (if needed)
Coal Mine/TS	817	10	1/3	Plant 100 sumac/tubes
Coal Mine/TS	817	10	2/3	Improve waterholes
Coal Mine/TS	817	10	1/3	Rake area and seed with wildlife seed mix
Coal Mine/TS[1]	817	13	4/3	Release mast shrubs (juneberry, witchhazel)
Coal Mine/TS	817	14	4/3	Plant 75 crab or hawthorne/tubes, 275 spruce, 10 apple/unit fences
Coal Mine/TS	817	41	3/3	Plant 400 spruce (4 sites)
Coal Mine/TS	817	47	1/3	Plant 100 spruce
Coal Mine/TS	817	40	1/3	Plant 75 crab or hawthorne/tubes

Sale Name	Comp.	Stand	Acres/ Ma	Project Description
Coal Mine/TS	817	35	3/3	Release mast shrubs (juneberry, witchhazel)
Coal Mine/TS	817	35	3/3	Regenerate Aspen by chainsaw/dozer
Coal Mine/TS	817	35	3/3	Plant 200/acre Aspen and tube (if needed)
Coal Mine/TS	817	35	1 each/3	Create Vernal pond
Coal Mine/TS	817	35	2/3	Plant 300 wh.pine, 100 hawthorne or crab/tube
Coal Mine/TS	817	37	10/3	Regenerate 10 acres of Aspen
Coal Mine/TS	817	38	1/3	Prune and Release 2 Apple trees
Coal Mine/TS	817	38	2/3	Plant 100 crab/tube
Coal Mine/TS	817	38	4/3	Release hemlock
Coal Mine/TS	817	38	4/3	Regenerate Aspen by chainsaw/dozer
Coal Mine/TS	817	38	4/3	Plant 200/acre Aspen and tube (if needed)
Coal Mine/TS	817	38	4/3	Release mast shrubs (juneberry, witchhazel, viburnum) (2 sites)
Coal Mine/TS	817	30	10/3	Plant 100-125 sugar maple, ash/acre (underplant after thin/tube
Coal Mine/TS	817	29	2/3	Plant 100 blueberry and/or cranberry/acre and tube if needed
Coal Mine/TS	817	52	1/3	Regenerate Aspen by chainsaw/dozer
Coal Mine/TS	817	52	1/3	Plant 200/acre Aspen and tube (if needed)
Coal Mine/TS	817	52	1/3	Plant 50 hawthorne or crabapple/tube
Coal Mine/TS[1]	817	53	4/3	Regenerate Aspen with commercial CC
Coal Mine/TS	817	53	4/3	Plant 200/acre Aspen and tube (if needed)
Coal Mine/TS[1]	817	13	4/3	Create herbaceous opening and seed
Coal Mine/TS	818	2	3/3	Fence existing hobblebush
Coal Mine/TS	818	2	1/3	Plant 100 crabapple or hawthorne/tube
Coal Mine Wrap Around	818	20	1/3	Plant 50 crabapple/hawthorne in 3 existing openings/tube
Coal Mine/WA	819	20	1/3	Plant 50 blueberry or cranberry/3 cribs
Coal Mine/WA	819	23	2/3	Prune and Release 5 apple trees
Coal Mine/WA	819	19	1/3	Create herbaceous opening by raking and seeding obliterated road (1/4 mile)
Coal Mine/WA	819	46	3/3	Regenerate Aspen by chainsaw/dozer
Coal Mine/WA	819	46	3/3	Plant 200/acre Aspen and tube (if needed)
Coal Mine/WA	819	43	3/3	Regenerate Aspen by chainsaw/dozer
Coal MineWA	819	43	3/3	Plant 200/acre Aspen and tube (if needed)
Coal Mine/WA[1]	819	3	2/3	Regenerate Aspen by chainsaw/dozer
Coal Mine/WA	819	3	2/3	Plant 200/acre Aspen and tube (if needed)
Coal Mine/WA	819	33	1/3	Plant 100 spruce (west)
Coal Mine/WA	819	25	1/3	Prune and Release 3 Apple trees
Coal Mine/WA	819	25	9/3	Regenerate Aspen by chainsaw
Coal Mine/WA[1]	819	24	1/3	Regenerate Aspen by chainsaw/dozer
Coal Mine/WA[1]	819	26	4/3	Create herbaceous opening and seed. Alt. 1 only
Coal Mine/WA	819	13	1/3	Create herbaceous opening and seed
Coal Mine/WA	819	13	2/3	Plant 200 crabapple or hawthorne/tube in 3 openings
Coal Mine/WA	819	39	1/3	Plant 75 hawthorne or crabapple/tube
Coal Mine/WA[1]	819	41,8,7	5/3	Create herbaceous opening/seed. Alts. 1 and 4 only
Coal Mine/WA[1]	819	45	5/3	Create herbaceous opening/seed. Alt. 1 only
Coal Mine/WA[1]	819	8	4/3	Regenerate Aspen by chainsaw/dozer
Coal Mine/WA	819	8	4/3	Plant 200/acre Aspen and tube (if needed)
Coal Mine/WA	819	40	8/3	Regenerate Aspen by chainsaw/dozer

Sale Name	Comp.	Stand	Acres/ Ma	Project Description
Coal Mine/WA	819	40	8/3	Plant 200/acre Aspen and tube (if needed)
Coal Mine/WA	819	40	10/3	Reduce ground cover
Coal Mine/WA	819	40	3/3	Plant 100 blueberry, 50 crabapple or hawthorne in 6 cribs and 50 tubes
Coal Mine/WA	820	48	4/3	Regenerate Aspen by chainsaw/dozer
Coal Mine/WA	820	48	4/3	Plant 200/acre Aspen and tube (if needed)
Coal Mine/WA	820	46	1/3	Fence existing shrubs
Coal Mine/WA	820	46	1/3	Plant 50 blueberry or cranberry in 3 cribs
Coal Mine/WA	820	46w	1/3	Plant 50 blueberry or cranberry in 3 cribs
Coal Mine/WA	820	46	9/3	Prune and release 27 apple trees
Coal Mine/WA	820	46	1/3	Place bluebird nest box(s)
Coal Mine/WA	820	51	1/3	Prune and Release 2 Apple trees
Coal Mine/WA	820	51	1/3	Protect stream bank with stabilizer and create fish cover
Coal Mine/WA	820	49	2/3	Protect stream bank with stabilizer and create fish cover
Coal Mine/WA	820	49	2/3	Prune and Release 6 apple trees
Coal Mine/WA	820	31	1/3	Plant 50 hawthorne/tube
Coal Mine/WA	820	48	5/3	Prune and Release 14 apple trees
Thomas Rock Bloody Run	826	1	5/3	Regenerate Aspen by chainsaw
T. Rock/BR	826	1	1/3	Prune and Release 3 Apple trees
T.Rock/BR	826	3	5/3	Regenerate Aspen by chainsaw
T.Rock/BR	826	3	1/3	Prune and Release 3 Apple trees
T.Rock/BR	826	73	3/3	Plant to Aspen and blueberry/tube or cribs
T.Rock/BR	826	10	1/3	Prune and Release 3 Apple trees
Thomas Rock Rock Run	827	7	10/3	Area is an abandoned farm field. Plant 10 acres to soft and hard mast producing shrubs. i.e. maple leaf viburnum, hazelnut, hickory
T.Rock/RR	827	7	5/3	Establish warm season grasses
T.Rock/RR	827	7	5/3	Maintain warm season grasses every 3-5 years
T.Rock/RR	827	8	3/3	An existing open field. Plant 1 acre to shrubs. Establish 2 acres in warm season grasses.
T.Rock/RR	827	8	2/3	Maintain warm season grasses every 3-5 years
Thomas Rock Thomas Run	827	62	3/3	An existing open field. Plant 1 acre to shrubs. Establish 2 acres in warm season grasses.
T.Rock/TR	827	62	2/3	Maintain warm season grasses every 3-5 years
T.Rock/TR	827	6	3/3	An existing open field. Plant 1 acre to shrubs. Establish 2 acres in warm season grasses.
T.Rock/TR	827	6	2/3	Maintain warm season grasses every 3-5 years
T.Rock/RR	827	4	3/3	An existing open field. Plant 1 acre to shrubs. Establish 2 acres in warm season grasses.
T.Rock/RR	827	4	2/3	Maintain warm season grasses every 3-5 years
T.Rock/RR	827	23	5/3	Regenerate Aspen by chainsaw
T.Rock/RR	827	31	2/3	Fence existing hobblebush
T.Rock/RR	827	31	1/3	Regenerate Aspen by chainsaw and plant an additional 1 acre of aspen/tube
T.Rock/RR	827	53	1/3	An existing opening; Plant 1 acre to shrubs
T.Rock/RR	828	6	3/3	An existing opening; Plant blueberry/cribs
Rocket John Study	684	26	6/3	Area is an existing 8 acre opening; Plant 3 acres to aspen and 1 acre to shrubs and 2 acres to apple trees

Sale Name	Comp.	Stand	Acres/ Ma	Project Description
Rocket John Jump Off	700	67,93, 91,56	20/3	If thinning is implemented, underplant w/white pine. Plant hemlock at edge between red pine stands and stream. 5 acres each unit
R.John/JO	700	8	1/3	Existing opening. Plant 10 large apple trees/unit fences
R.John/JO	700	92	10/3	Plant hemlock on the perimeter
R.John/JO	700	95	5/3	An existing opening. Plant 4 acres with hemlock, button bush, alder and willows. 1 acre (dry site), plant fruit producing shrubs
R.John/JO	700	100	5/3	An existing 10 acre opening near Rappe Run. Plant with dogwood, mountain ash, winter berry and hemlock.
R.John/JO	701	25	3/3	An existing opening. Plant winterberry, alder and button bush along stream course.
R.John/JO	701	17,22 41	15/3	If thinning is implemented, underplant w/white pine. Plant hemlock at edge between red pine stands and stream. 5 acres each unit
Rocket John Pigs Ears	712	6	2/3	An existing opening near E. branch of Spring Creek. Plant with shrubs; alder and hemlock
R.John/PE	712	7	10/3	An existing opening. Disc and re-seed 5 acres to herbaceous opening. Plant 5 acres to shrubs
R.John/PE	712	10	4/3	An existing opening; Plant shrubs, alder and hemlock
R.John/PE	712	27	2/3	Plant to conifer and shrubs
West Branch Little Cross Iron Rail	651 675	All	25 /3	Wildlife seeding of landings, skid trails and roads.
Little Mill Creek (Same Name)	853	40,43 44	15/3	If salvage overstory removal or overstory removal is implemented, depending on first year stocking results, plant 5 acres each with white pine, hemlock and mast producing shrub and tree species
Salmon Creek Sutton	641	93	5/3	After overstory removal, depending on first year stocking results, plant 5 acres with white pine, hemlock and mast producing shrub and tree species.
Sal. Creek/S	639 641,42	All	5/3	Wildlife seeding of landings, skid trails and roads.
Bear Creek Slider	865	29	2/3	Regenerate Aspen by chainsaw.
B. Creek/Slide	865	21	1/3	Prune and Release 3 Apple trees
B. Creek/Slide	865	41	1.5/3	Existing openings on both sides of 237C. Depending on soil; plant both sides to a meadow mix consisting of wildflowers and grasses.
B.Creek/Slide	871	30	3/3	Prune and release 10 apple trees
B.Creek/Slide	871	10	4/3	Prune and release 12 apple trees. Plant 1 acre to soft mast producing shrubs
B.Creek/Slide	882	48	4/3	Prune 4 Apple trees. Plant a meadow mix of wildflowers and grasses on remainder of site.
Bear Creek FR 385	866	16	2/3	Prune and release 6 apple trees
B.Creek/FR	866	36	2/3	Place individual fences around the gooseberry. Prune and release apple trees Plant 1 acre to aspen/tube
Bear Creek Little Mill Creek	854	19	3/3	Plant 200/acre aspen/tube

Sale Name	Comp.	Stand	Acres/ Ma	Project Description
B.Creek/LMC	854	20	5/3	If salvage overstory removal or overstory removal is implemented, depending on first year stocking results, plant 5 acres with white pine, hemlock and mast producing shrub and tree species.
Bear Creek Little Silver	868	13	2/3	Plant to soft mast producing shrubs
B.Creek/LS	868	13	3/3	Plant 10 large stock apple, crabapple in N. of opening; 5 in center of opening and 30 smaller crabapple near seep to south.
B.Creek/LS	868	3s	1/3	Plant 100 spruce in 4 rows to provide a visual barrier
B.Creek/LS	868	3e	1/3	Plant 50 blueberry and 20 sumac near FR 340
B.Creek/LS	868	7	1/3	Plant 20 witchhazel in 4 groups near OGM road drainage Plant 5 large stock apple trees/unit fences
B.Creek/LS	868	10	2/3	Opening near FR 185, Plant 20 Spruce, in southern opening, Plant 40 spruce, in the center, plant 5 large stock crabapple
B.Creek/LS	868	14	2/3	Small openings exist through unit due to mortality of overstory vegetation. Saturate Plant 2 sites with 100 spruce each.
B.Creek/LS	869	7	4/3	Plant 50 spruce NW. Plant 4 sites on perimeter with 20 winterberry each.
B.Creek/LS	869	19	1/3	Plant 125 aspen trees (10x10 spacing)
West Kane Two Creeks	831	13	5/3	If Salvage Overstory Removal occurs, depending on succes of first year stocking surveys, plant 5 acres each with white pine, hemlock, fruit producing shrubs or trees
West Kane Hillside	833	102	5/3	If Salvage Overstory Removal occurs, depending on succes of first year stocking surveys, plant 5 acres each with white pine, hemlock, fruit producing shrubs or trees
West Kane Grandview	844	38,42	10/3	If Salvage Overstory Removal occurs, depending on succes of first year stocking surveys, plant 5 acres each with white pine, hemlock, fruit producing shrubs or trees

Site-specific instructions for marking guidelines. General and site specific mitigations that apply to these guidelines are available in Appendix D of the Eastside EIS.

The Branch Sub-Watershed

Compartment 675 Stand 12 - Avoid the 11 acre sphagnum peat swamp between West Branch and Slater Run.

Spring Creek Sub-Watershed; Rocket John Sale

Compartment 712, Stand 7 - Reserve all sizes of healthy beech and hemlock; protect midstory hemlock when felling; possible reserve areas (if required) exists in rocky area of stand. Otherwise, possible non-commercial treatment to release some of the hemlock.

Compartment 712, Stand 16 - Avoid seeps on south 1/3 of stand
Compartment 712, Stand 19 - Retain large healthy beech.

Compartment 684, Stand 56 - Buffer spring 50'; protect and retain large overstory hemlock at headof spring and elsewhere.

Little Mill Creek Sub-Watershed; Mortality II

Compartment 854, Stand 35 - Avoid the 2 large areas of rock outcroppings along the Mill Creek Loop Hiking Trail northeast of forest road 185E.

Thomas Run Sub-Watershed; Forest Road 873 Sale

Compartment 828, Stand 35 - Avoid large sphagnum swamp.

Thomas Run Sub-Watershed; Rock Run Sale

Compartment 827 - Protect exisiting shrubs within the grouse management area when implementing activities.

INDEX

A

age class 17, 23, 41
alternative (s) 1, 17, 20, 23-24, 27, 30-39, 41-43, 49, 51
Alternative 1..... 17, 19-20, 27, 35-36, 42
Alternative 2.....20, 22
Alternative 3..... 23, 25-26, 42
Alternative 4..... 26, 29-30, 34, 36
Alternative 5.....30, 33, 42
aspen 20, 26, 30, 51-56

B

bald eagle 1, 2, 31-32, 42, 44, 46
bat..... 1-2, 4-11, 32-36, 41-42, 44-46
betterment 18, 20-23, 26, 28-29
Biological Assessment (BA).....1, 2, 4, 8, 10, 27, 41, 46
Biological Opinion (BO).. 1, 8-10, 32, 41-42, 46-47
buffer..... 12, 31, 37-39, 57
butternut 2, 15, 39, 42-43, 46

C

canopy.....3, 6-7, 9-11, 31-34, 36, 42
catch basins 20, 26, 30, 51-53
channel darter..... 2, 16, 39-40, 43
clearcut.....19, 25, 29, 32, 51
clubshell mussel.....1, 2, 12, 40, 43
commercial thinning 19, 25
communities..... 37, 47, 49-50
composition.....10, 18, 24, 28
conifer 4, 15, 20, 26, 30, 51-52, 56
construction.. 18, 20-23, 26, 28-29, 31, 33, 36-39
creeping snowberry..... 2, 15, 39-40, 43
cumulative effects 36, 40-42

D

dead trees 6-10, 34, 36
decommission 18, 20-22, 24, 26, 28-29
direct effects.....32
diversity 5, 17, 23, 27, 30, 42
dragonflies.....12, 38, 47
dying trees..... 20, 26-27, 32

E

early successional.....7
effects.....30, 33, 35-36, 42, 49
even-aged..... 17, 21, 23, 27, 33
existing condition 9-10

F

fencing 17-20, 22-27, 29-30, 33, 39, 41, 51, 53-56
final harvest 32, 34, 41
fish structures..... 20, 26, 30, 51
foraging habitat..... 3, 7-9, 32, 34, 36, 41-42, 45

G

gilt darter.....2, 16, 39-40, 43
gravel chub 2, 16, 39-40, 43
green faced clubtail..... 1, 38, 40, 43
group selection..... 19, 25, 29

H

harpoon clubtail 1, 13, 38, 40, 43
harvest.6, 17-18, 20, 23-24, 26-27, 30-34, 38-39, 41
herbicide 17-18, 23-24, 27, 29-30, 37-39, 41
hibernacula..... 4, 6, 8, 46

I

impacts... 1, 17, 21, 23-24, 27, 30, 32, 36, 38-39, 42-43, 46
incidental take.....32-33, 41
Indiana bat 1, 2, 4-6, 8-10, 32-36, 42, 44-47
indirect effects 33, 35, 41
intermediate thinning..... 41

L

landscape 5-9, 12, 17, 23, 27, 33, 35-36
landscape habitat..... 9
limestone surfacing.....37-40
longhead darter 2, 16, 39-40, 43
long-solid mussel..... 1, 12, 38, 40, 43

M

Maine snaketail..... 1, 14, 38, 40, 43
maternity habitat 11
midland clubtail 1, 13, 38, 40, 43
mitigation..... 31-32, 36-37, 39-40, 42, 57
monitoring 3, 30, 46, 49
mountain brook lamprey.....2, 16, 39-40, 43
mussels..... 1, 2, 12, 38, 40, 43, 47

mustached clubtail 1, 13, 38, 40, 43

N

nest boxes.....20, 26, 30, 51, 53, 55
No Action.....30
non-forested 49-51
northern long-eared bat.....1, 11, 36, 42, 46
northern riffleshell mussel 1, 2, 12, 38, 40, 43
northern water shrew.....1, 11, 37, 40

O

obliteration 38-40
openings..6, 15, 18-20, 24-26, 28-30, 34, 36, 41, 49, 51-56
overstory removal 56-57

P

pits..... 18, 20-22, 24, 26, 28-29, 33, 53
planting 17-20, 22-27, 29-30, 41, 51-56
prep cut/two-aged.....19, 25
private land.....2, 20, 22, 26, 29, 37, 41
Proposed Action.....17
prune 20, 26, 30, 51-54, 56

R

rapids clubtail.....1, 13, 38, 40, 43
realignment 18, 20-23, 26, 28-29
reconstruction..... 18, 20-22, 24, 26, 28-29
reforestation 17, 19, 23, 25-27, 29, 35
reforestation treatments only.....19, 25, 29
regeneration..... 17-19, 21, 23-27, 33, 39, 42
regeneration harvest..... 17-19, 23-25, 27
release ...18, 20, 22, 24-26, 28-30, 36, 39, 51-53, 55-56
removal cut.....19, 25, 33
restoration 17-18, 20-24, 26-27, 29-30, 49
riparian 15, 38, 39-40, 49
roads....5, 7, 13, 18, 20-24, 26, 28-32, 37-40, 49, 54, 56-58
roost habitat..... 6-10, 32, 34-36, 42
rough cotton-grass..... 2, 15, 39-40, 43

S

salvage ...17, 19-20, 22-23, 25-27, 29, 32, 41, 56
salvage thinning 17, 19, 21-23, 27
seeding 20, 26, 30, 51, 53-54, 56
selection 19, 25, 29, 32-33, 41-42
sensitive 1, 15, 38-39
sensitive species.....1, 11, 15, 49
shelterwood removal cut.....19, 25, 34
shelterwood removal cut (delay) 19
shelterwood seed cut..... 19, 25, 42
size class 10, 34, 50-51
ski-tailed emerald 1, 13, 38, 40, 43
small whorled pogonia.....2, 14, 39-40, 43, 49
spotted darter 2, 15, 39-40, 43-44
stone pits..... 18, 20-22, 24, 26, 28-29
streams..... 3, 7, 11-16, 31, 37-40, 44, 49, 53, 55
structure 7, 11, 17, 21, 23, 27, 31, 33
surveys..... 3-5, 8, 11-15, 39, 44-47, 49, 57
swarming habitat.....8

T

temporary road/long skid.....20, 22, 26, 29
thread rush 2, 15, 39-40, 43
threatened and endangered species...1, 2, 10, 35-36, 46
timber rattlesnake 1, 2, 30, 42
Tippecanoe darter 2, 16, 39-40, 43
transition cut 19, 25
transportation system..... 17-18, 20, 22-24, 26-29
two-aged 19, 25, 41-42

U

U.S. Fish and Wildlife Service (FWS) .. 1-2, 4-5, 7-9, 14, 16, 32-34, 41-42, 44-47
Uhler's sundragon 1, 14, 38, 40, 43
uneven-aged..... 17-19, 21, 23-27, 29, 34

V

vegetation...7-8, 17, 19, 22-23, 25-26, 29-31, 33, 37, 39, 42, 49, 57

W

water holes.....20, 26, 30, 36, 51
wetlands.....7, 11, 15, 39-40, 47, 49
Wiegand's sedge.....2, 14, 43, 45
wildlife...18-19, 24-25, 28-29, 31, 36, 42, 44-45, 47
wildlife habitat..17-18, 20, 23-24, 27-28, 30, 33, 36, 49, 50
wildlife treatments 20, 26, 30, 51
woody debris.....32, 37

Y

yellow-bellied flycatcher 1, 4, 32, 42

Z

zebra clubtail.....1, 14, 38, 40, 43

APPENDIX D: MITIGATION MEASURES

This appendix is a summary of the mitigations listed and discussed in Chapter 3, Environmental Consequences. It is broken out into four separate sections: Mitigation measures tied to specific stands; those measures common to all units; mitigations for the project area, not tied to stands; and those measures associated with the Biological Assessment.

MITIGATION MEASURES TIED TO SPECIFIC STANDS FOR EACH ALTERNATIVE.

A coding system was used to identify those measures associated with each compartment and stand. The coding system that follows matches the title columns in the Alternative spreadsheets.

Area	Code	Description
OGM/Private	**G1**	Protect pipeline, powerline, OGM wells, private land, and boundary markers, and remove debris.
Heritage	**H1**	Protect heritage site.
Recreation	**R1**	Hauling is not permitted from Noon Friday through Sunday from 5/20 to 9/30
Recreation	**R2**	Harvest activities will be permitted from 10/1 to 5/19 while the ATV trail is closed.
Recreation	**R3**	Within 200 feet of the North Country Trail, logging and road building activities will occur only during frozen ground conditions (January to Mid-March).
Recreation	**R4**	On trails not on roads, logging traffic signs will be posted along the trail to warn users of harvest activities.
Recreation	**R5**	Fencing will be kept 50 feet from all trails.
Recreation	**R6**	Any ATV Trails used for skidding will be returned to their original condition. Skid trails crossing the ATV Trail will be blocked to discourage motorized use off trails.
Recreation	**R7**	Decking of logs is not permitted in the Marienville ATV Trailhead.
Recreation	**R8**	Using selected trails as skid roads will not be permitted. The number of skid crossings will be kept to a minimum, and will be seeded and mulched once closed.
Recreation	**R9**	Using the snowmobile trail as a skid road will not be permitted from 12/20 to 4/1 when conditions are favorable to snowmobiling. Trails used for skidding will be returned to their original condition.
Recreation	**R10**	Along Disabled Hunter Roads, no harvest, hauling, or road building activities permitted during hunting seasons (October-January and May).
Recreation	**R11**	Herbicide treatment will not be permitted Friday through Sunday in units bordering trails.
Landtypes	**S1***	Conventional rubber tired skidding equipment will be permitted to operate only during dry periods of the year (typically 6/15 - 9/30) or frozen ground conditions (Forest Plan, p. 4-22). (* When ***both*** S1 and S2 are listed in the Mitigation Measures Tables beginning on page D-8, either S1 or S2 will be applied.)
Landtypes	**S2***	Low ground pressure skidding equipment may operate during the entire normal operating season designated in the timber sale contract (Forest Plan 4-22 to 23). This may be moderated on some site conditions to the seasonal operating times (S1 above) when S1 and S2 are designated for that stand. (* When ***both*** S1 and S2 are listed in the Mitigation Measures Tables, either S1 or S2 will be applied.)
Landtypes	**S3**	The grade of skid trails should not exceed 15 percent, except lengths up to 200 feet may pitch to 20 percent when sufficient cross-drainage is provided (Forest Plan, p. 4-23).

Area	Code	Description
Landtypes	**S4**	Landings that must unavoidably be located on poorly drained landtypes and landtype GS2a should consider the use of geotextiles and surfacing. All roads on these landtypes should use geotextiles.
Landtypes	**S5**	If wetlands and/or seeps are found during project layout the following management is suggested: 1) Avoid harvesting inside wetlands or within seeps; 2) Avoid crossing wetlands and seeps; 3) Leave a 30-foot shade and microclimate buffer from edge of wetlands or seeps; and 4) Leave trees within 30 feet of the edge of wetlands or seeps that would appear to have the potential to fall into them (start the recruitment process)
Vegetation	**VE 1**	Signs notifying users of herbicide treatment will be posted prior to treatment and at least 30 days following treatment in the following places: adjacent to roads, trails, recreation areas, administrative sites or any other location where the public can be expected to enter the treatment area.
Vegetation	**VE2**	Landowners adjacent to spray areas will be notified prior to spraying. Residents occupying dwellings on adjacent private land will be notified three to four weeks before spraying begins and again if requested by a landowner, 24 hours before treatment begins. Individuals (such as loggers, woodcutters, OGM operators, contractors, berry pickers, etc.) known to be using a proposed treatment area shall be notified before treatment begins.
Vegetation	**VE3**	Buffer areas will be delineated along roadside ditches and cut banks where runoff into a stream or soil erosion could occur. Specific buffer widths will be determined during the site-specific analysis for specific treatment proposals.
Vegetation	**VE4**	To protect water resources during the application of herbicides, the appropriate buffer strip will be used as outlined on page 4-25 of the Forest Plan.
Vegetation	**VE5**	Pipelines, electric lines, and wells in the treatment areas will be located and flagged where necessary so the contractor's herbicide application equipment can avoid damage to these structures.
Vegetation	**VE6**	The amount of herbicide application within one operating season will be limited to a maximum of 40 contiguous acres, except where individual stand size exceeds 40 acres.
Visuals	**VS1**	Leave a no cut or modified vegetative buffer adjacent to visual facility; Landscape Architect will design this in the field. (Example: ¼-acre clumps left in foreground)
Visuals	**VS2**	Locate landings off of visual facility
Visuals	**VS3**	From the edge of road, slash will pulled back 15 feet and lopped and scattered to a depth of 3 feet for an additional 35 feet. Face marking paint away from visual facility. From the edge of trail, slash will be pulled back 25 feet, and lopped and scattered to a 3-foot depth for an additional 75 feet. Face marking paint away from visual facility
Visuals	**VS4**	Harvest during leaf-off season.
Water	**WA1**	Protect water resource and fish habitat as outlined by standards and guidelines in the 2500 and 2600 sections of the Forest Plan
Water	**WA2**	A majority of standing dead trees and snags (including larger trees) within 50' of perennial and significant intermittent stream courses should be retained for the input of coarse, large woody debris to stream course and streamside zones.
Water	**WA3**	Cutting, equipment, and/or harvest restrictions to protect riparian areas.
Wildlife	**WL1**	A 660 ft. no cut buffer will be established around the known nest location. Logging is restricted from March 1st through June 30th.
Wildlife	**WL2**	Require seasonal operating restrictions and no cutting of nest tree. (Red-tail hawk)
Wildlife	**WL3**	A 660 ft. no cut buffer will be established around the known nest location. Logging is restricted from March 1st through July 31st.

Area	Code	Description
Wildlife	**WL4**	Aspen regeneration cutting will be done during the dormant season from Nov. 15 - March 15.
Wildlife	**WL 5**	No activity within 320' nest buffer, seasonal restrictions up to 1320': April 1 - July 31.
Wildlife	**WL6**	Logging will occur outside the turkey nesting season (April 15-June 30) to the extent possible.
Wildlife	**WL 7**	There will be no timber hauling from March 1st through July 31st on Forest Road 317. Also, public access will be restricted during the same time.
Wildlife	**WL 8**	Release mast-producing species by marking competing species for removal.
Wildlife	**WL 10**	*GREEN PARTIAL HARVEST* - Retain all snags ≥ 9" dbh,. Retain at least 16 live trees per acre>= 9" dh. Mark and retain 3 live den trees per acre. Retain 1 live tree in the vicinity of about 1/3 of all large diameter (>12 " dbh) snags with exfoliating bark.
Wildlife	**WL 11**	*GREEN FINAL HARVEST* - Retain all snags ≥ 9" dbh. Retain at least 8-15 live trees >= 9" dbh per acre in 2 diameter classes of 9" -19.9"dbh and ≥ 20" dbh. Mark and retain 3 live trees in the vicinity of about 1/3 of all large diameter (>12" dbh) snags with exfoliating bark.
Wildlife	**WL 12**	*SALVAGE PARTIAL* - Retain 5-10 snags/ac ≥ 9" dbh. Of these, 1 snag ≥ 16"dbh must be retained for every 2 acres. Retain at least 16 live trees per acre ≥ 9" dbh including 3 trees/ac ≥ 20" dbh. Mark and retain 3 live den trees per acre. Retain 1 live tree in the vicinity of about 1/3 of all large diameter (> 12"dbh) snags with exfoliating bark.
Wildlife	**WL 13**	*SALVAGE FINAL* - Retain at least 3 snags/acre > = 9" dbh. Of these, 1 snag > = 12" dbh must be retained for every 10 acres. Retain at least 8-15 live trees/acre ≥ 9" dbh including at least 1 tree/ac ≥ 20" dbh.
Wildlife	**WL 14**	For compartment/stands 854/35, 701/17&22, 684/11&14, 700/89, 712/19. The wildlife biologist will delineate a line around the boulder area to protect the integrity of the denning site. Within this denning site no road construction or motorized trail construction will be permitted.
Wildlife	**WL15**	For compartment/stands 854/35, 701/17&22, 684/11&14, 700/89, 712/19. In order to minimize potential harm to rattlesnakes during logging these sites will be logged between September 1st and April 1st. All skidding and logging operations must avoid damage or movement of large surface rock and boulders to avoid damage to denning sites.

MITIGATIONS COMMON TO ALL UNITS

Resource	Mitigation
Landtypes	The critical element to reduce soil disturbance is surface management. Soil disturbance is reflected in the percent of area covered. This is true for all soil groups. Management of the tree removal process is key.
Landtypes	When roads are obliterated, natural drainages should be maintained, natural landforms may be restored, and road profiles will be ripped to improve deep rooting potential
Landtypes	Stands that have riparian areas will be managed to maintain and enhance riparian dependant values. This includes a non-disturbance area sufficient to sustain these dependant values and the micro-climate.
Recreation	Resulting slash and other debris shall be removed from major skid roads, abandoned railroad grades, private land, the cleared area of powerlines, pipelines, well sites, trails, roads, and landings to be left open or seeded.

Resource	Mitigation
Wildlife	In regeneration units, retain a clump approximately 1/4 acre in size for every 5 acres harvested. Wildlife needs are best met if clumps contain any and all of the following: den trees, snags, oak/hickory, conifers, minority and mast species and a variety of tree sizes.
Wildlife	Protect and/or enhance large boulder fields and rock outcroppings
Wildlife	Site preparation harvest, cutting of beech and stripe maple, will occur outside the songbird nesting season (April 1 - June 30).
Wildlife	Protect existing springs and seeps and other water areas critical to wintering wildlife. i.e. areas of dense hemlock, laurel or rhododendron.
Wildlife	Spring seeps will be protected from damage by all resource management activities (Plan, p.4-31)
Wildlife	Locate haul roads at least 50 yards downstream from the head of the seep. Use appropriate erosion control methods to minimize the movement of silt into any seep (Plan, p. 4-31).
Wildlife	Landings and skid trails will be seeded with a wildlife mix and mulched to ensure stabilization of site and benefits to wildlife.
Wildlife	If any stick nests are found prior to or during implementation, work will stop and a wildlife biologist will be notified. The status of the nest will be determined and the appropriate mitigation measure will be implemented.
Wildlife	When thinning, retain species that are minor components of a stand, particularly mast producers (Forest Plan, p. 4-6).
Wildlife	During all vegetation treatments, retain butternut and other minor components of a stand particularly hard and soft mast producers
Wildlife	Retained logs for coarse woody debris will be at least 14" dbh and at least 18' long, where available and may not include quaking or bigtooth aspen, yellow, black or paper birch. These logs should not be highly decomposed. 1) Within 150 feet of Forest Service roads: since these areas are open for personal use firewood gathering, no specific dead and down retention requirements will be followed in these areas. 2) In areas of concentrated windthrow (more than 5 down logs in close vicinity), retain one log within each group of 5 trees salvaged. 3) In areas of scattered windthrow, (less than 5 down logs in close vicinity), retain at least 2-3 down logs per acre.

MITIGATION MEASURES NOT SPECIFICALLY TIED TO STANDS BUT APPLYING WITHIN THE PROJECT AREA

Resource	Mitigation
Recreation	Snowplowing of designated snowmobile routes will be done as to leave an adequate path of snow for grooming and snowmobile operation. Snowplowing activities will leave a 4-6 inch mat to protect the road surface.
Recreation	FR 126, 133, 152, 176, 176a, 182, 195, 243a, 243Ab, 287, 435, 476, 498, 498a, 498b are the Allegheny Snowmobile Loop between December 20 and April 1. No hauling will be permitted on weekends from noon Saturday until 5:00 pm Sunday when conditions are favorable for snowmobiling. At other times, commercial and administrative traffic will run with their lights on during favorable snow conditions. Logging traffic signs will be posted along the snowmobile trail to warn riders of harvest activities.
Recreation	Any road reconstruction of FR 126, 133, 176a ,182, 195, 243a, 243Ab, 435, 476, 498, 498a, 498b will be done outside the winter activity season 12/20 to 4/1.

Resource	Mitigation
Recreation	FR 221, 287, and 498 are Snowmobile Connectors from December 20 and April 1. All traffic will run with their lights on during favorable snow conditions. Logging traffic signs will be posted along the snowmobile trail to warn riders of harvest activities.
Recreation	Road reconstruction/construction activities that occur on the ATV trail will be permitted from 10/1 to 5/19 while the ATV trail is closed. Roads that fall under this restriction include: *225, 395, 395a (to the Bike Trail), 395d, 395f, 396, 396a, 396Ac, 395dc, 396b, 396Ba, 396c, 740, 740b*
Recreation	On FR 143, no hauling will be permitted on weekends from noon Friday until 5:00 am Monday, Memorial Day through Labor Day.
Water	All dirt and gravel road segments within 300' of a stream course being proposed for use in the East Side project will be surfaced with commercial limestone if the road is open year-round or restricted. If the road is closed year-round, apply commercial grade stone (i.e., 2A).

MITIGATION MEASURES ASSOCIATED WITH THE BIOLOGICAL ASSESSMENT

Specific Species	Mitigation
Rattlesnake	For Compartment/Stands 854/35, 701/17 and 22, 684/11 and 14, 700/89, 712/19. The wildlife biologist will delineate a line around the boulder area to protect the integrity of the denning site. Within this denning site no road construction or motorized trail construction will be permitted.
Rattlesnake	For Compartment/Stands 854/35, 701/17 and 22, 684/11 and 14, 700/89, 712/19. In order to minimize potential harm to rattlesnakes during logging these sites will be logged between September 1st and April 1st. All skidding and logging operations must avoid damage or movement of large surface rock and boulders to avoid damage to denning sites.
Bald Eagle	The following buffer zones and time of year restrictions shall apply to Bald eagle nests, including those abandoned for <3 years • 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. • 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. • From January 15 to July 31 of each year, people and aircraft 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. • 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.
Bald Eagle	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.

Specific Species	Mitigation
Bald Eagle	On the side slopes surrounding the Allegheny Reservoir and on the side slopes along 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 supercanopy trees but also trees that may provide nesting or roosting sites in the future, such that a sustainable supply will be available.
Bald Eagle	When a tree containing an eagle nest has been blown down or has been damaged so it can no longer support a nest, once a new nest in a different location is established buffer zones may be removed. If a new nest is not established but large super-canopy trees remain within the 330-foot buffer zone of the old nest, maintain the original 330-foot zone through three breeding seasons to observe any attempts to rebuild a nest near the original location. After three years with no new nesting attempts the buffer zone can be removed.
Bald Eagle	When a nest structure disappears but the nest tree remains, the buffer zones should remain in effect through at least the following three breeding seasons. If the nest is not rebuilt, remove the zoning but still consider the area as important eagle habitat and protect accordingly.
Bald Eagle	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..
Bald Eagle	Bald eagle roosting areas shall be identified and protected. Activities that may result in the 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	Retain all shagbark and shellbark hickories (live, dead, and dying), regardless of size, in partial and final harvest cutting units (green and salvage units).
Indiana Bat	Snag and Live Tree Retention (WL 10, 11, 12, 13) • 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. • For both partial and final harvests in salvage units (dead or dying trees make up 50 percent or more of the harvested volume), and clearcuts, 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 clearcuts when available. • 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. • 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. • 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).
Indiana Bat	In order to minimize incidental take of roosting bats, 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. Such removal, however, will be as a last resort, after other alternatives (such as fencing the area, etc.) have been considered and deemed unacceptable.

Specific Species	Mitigation
Indiana Bat	Activities within a 1.5-mile radius of Indiana bat maternity sites shall be subject to further consultation. Such activities include those that may affect the Indiana bat or alter its habitat (e.g., by removing potential roost trees or altering percent canopy closure), such as timber harvesting, road construction, trail construction, and federal oil and gas development. In addition, if an Indiana bat maternity site is found on ANF, the Forest Service shall consult with FWS to determine/develop standards and guidelines and/or a conservation plan to protect and manage the site.
Indiana Bat	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.
Butternut	When thinning, retain species that are minor components of a stand, particularly mast producers (Forest Plan, p. 4-6).
Butternut	During all vegetation treatments, retain butternut and other minor components of a stand particularly hard and soft mast producers

CHANGES IN MITIGATION MEASURES BETWEEN DEIS AND FEIS

There are several changes to the mitigation table that are the result of prescription changes between the DEIS and FEIS, and the addition of two mitigation measures (VE5 and VE6) that pertain to the application of herbicides. The prescription changes between the DEIS and FEIS are described in Appendix B, pp. 76 – 82. The DEIS and FEIS both include discussion on mitigation measures VE5 and VE6, however the mitigation table included in the DEIS did not include these measures. On additional wildlife mitigation has been added to mitigation common to all units.

CHANGES IN MITIGATION MEASURES RESULTING FROM MODIFIED PRESCRIPTIONS

There are sixteen stands where prescription changes occur between the DEIS and FEIS. The mitigation table has not been edited to reflect changes in mitigation that result. Changes are described here.

Six stands have minor changes between the DEIS and FEIS. Either the objective for treatment has been changed from green to salvage, or the stand acres have been reduced. In all cases, there is no change in mitigation measures as described on the table here.

Seven stands are removed from the project proposal and all alternatives. All references to these stands on the mitigation table no longer apply. This applies to the following stands: Comp. 651, St. 30; Comp. 675, St. 60 and 103; Comp. 833, St. 35; Comp. 841, St. 85; Comp. 844, St. 15 and 60.

Three stands have prescription changes that modify treatments to be applied and result in fewer mitigation measures needed. The following changes are noted here, and are not changed on the following tables.

Compartment 700, Stand 35 – In alternatives 1 and 3, measures VE1 and R11 are dropped.

Compartment 701, Stand 37 – In alternatives 1 and 3, measures VE1, VE2, and VE3 are dropped.

Compartment 871, Stand 12 – In alternatives 1, 3 and 3, measures S3, WL 13, VS1 and VS2 are dropped.

Embedded Secure Document

The file *http://www.fs.fed.us/r9/allegheny/forest_management/projects/eastside/Appendix%20D_Mitigation%20Alt%201.PDF* is a secure document that has been embedded in this document. Double click the pushpin to view.

Mitigation Table Alternative 2

Compartment	Stand	W/in A2	VE1	VE2	VE3	VE4	VE5	VE6	S1	S2	S3	S4	S5	WA1	WA2	WA3	G1	H1	WL1	WL2	WL3	WL4	WL5	WL6	WL7	WL8	WL10	WL11	WL12	WL13	WL14	WL15	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	VS1 buffer	VS2 Landing	VS3 slash	VS4 leaf off
309	3	N																																														
309	10	N																																														
309	11	N																																														
310	10	N																																														
439	13	Y					Y		Y					Y	Y			Y																														
439	41	Y					Y												Y										Y							Y					Y						Y	
440	19	Y					Y		Y																				Y																			
440	40	Y					Y		Y																				Y																		Y	
445	5	N																																														
445	9	N																																														
445	10	N																																														
445	14	N																																														
445	16	N																																														
484	5	N																																														
484	8	N																																														
484	15	N																																														
484	29	N																																														
484	30	N																																														
484	31	N																																														
484	32	N																																														
484	33	N																																														
484	43	N																																														
484	44	N																																														
484	45	Y					Y														Y								Y																			
484	46	Y					Y				Y										Y								Y																			
484	48	Y					Y																						Y																			
484	49	Y					Y																						Y																			
484	52	N																																														
485	1	Y					Y		Y																				Y																			
485	25	Y					Y		Y			Y																	Y																			
485	28	Y					Y														Y								Y																			
485	43	N																																														
492	19	N																																														
492	20	Y					Y				Y													Y					Y																			
493	9	N																																														
493	10	N																																														
639	2	Y					Y		Y																																							
639	5	Y					Y		Y																				Y																			
639	7	Y					Y		Y		Y																		Y																			
639	10	Y					Y																						Y																			
639	17	Y					Y		Y																				Y																			
639	64	Y					Y		Y																				Y																		Y	
639	67	Y					Y				Y																		Y																		Y	
641	26	Y					Y		Y	Y																			Y																			
641	31	Y					Y		Y																				Y																			
641	42	Y					Y		Y							Y													Y																		Y	
641	44	Y					Y																						Y							Y				Y						Y	
641	82	Y					Y											Y											Y							Y											
641	86	Y					Y							Y	Y	Y													Y							Y				Y						Y	
641	166	Y					Y		Y																				Y																		Y	
641	170	N																																														
642	1	Y					Y						Y			Y		Y											Y																		Y	
642	4	Y					Y		Y				Y			Y													Y																		Y	
642	6	Y					Y		Y																				Y																			
642	13	Y					Y		Y							Y	Y												Y																			
642	16	Y					Y		Y		Y		Y	Y	Y	Y													Y																			
642	17	Y					Y		Y				Y	Y	Y	Y													Y																			
642	18	Y					Y		Y		Y					Y													Y																		Y	
642	21	Y					Y		Y																				Y																		Y	
642	23	Y					Y		Y																				Y																			
642	24	Y					Y		Y																				Y																		Y	
642	25	Y					Y		Y		Y		Y	Y	Y	Y													Y																			
642	27	Y					Y		Y																				Y								Y											
642	29	Y					Y		Y																				Y																		Y	
642	30	Y					Y		Y																				Y																			
651	19	Y					Y																						Y																			
651	25	Y					Y			Y			Y			Y													Y																			
651	30	Y					Y																						Y																			
651	78	Y					Y			Y			Y			Y													Y																		Y	
675	14	N																																														
675	16	Y					Y																						Y																			
675	20	Y					Y		Y																				Y																		Y	
675	21	N																																														
675	27	N																																														
675	41	Y					Y																						Y																		Y	
675	42	Y					Y		Y																				Y																		Y	
675	43	Y					Y		Y				Y			Y													Y																		Y	

Mitigation Table Alternative 2

675	**44**	Y					Y																					Y																		Y	
675	**45**	Y					Y		Y							Y												Y																			
675	**50**	N																																													
675	**51**	N																																													
675	**53**	N																																													
675	**58**	N																																													
675	**60**	N																																													
675	**61**	N																																													
675	**64**	Y					Y		Y	Y	Y		Y			Y												Y																			
675	**66**	Y					Y		Y																			Y																		Y	
675	**67**	Y					Y		Y							Y												Y																			
675	**72**	N																																													
675	**78**	N																																													
675	**79**	N																																													
675	**87**	N																																													
675	**92**	Y					Y																					Y																			
675	**103**	N																																													
675	**104**	N																																													
675	**107**	Y					Y		Y																			Y																			
675	**110**	Y					Y																					Y																			
675	**112**	Y					Y		Y																			Y																			
684	**1**	N																																													
684	**11**	N																																													
684	**14**	N																																													
684	**18**	N																																													
684	**28**	N																																													
684	**29**	N																																													
684	**30**	N																																													
684	**31**	N																																													
684	**32**	N																																													
684	**35**	N																																													
684	**56**	N																																													
684	**57**	N																																													
700	**2**	N																																													
700	**8**	Y					Y		Y	Y								Y										Y					Y			Y	Y	Y						Y	Y	Y
700	**9**	N																																													
700	**13**	Y					Y										Y											Y								Y										Y	
700	**14**	N																																													
700	**16**	Y					Y																					Y					Y			Y	Y								Y	
700	**18**	Y					Y		Y	Y																		Y					Y				Y									Y	
700	**21**	N																																													
700	**22**	N																																													
700	**25**	Y					Y		Y	Y						Y												Y					Y				Y										
700	**32**	N																																													
700	**34**	Y					Y		Y	Y			Y			Y												Y					Y				Y										
700	**35**	N																																													
700	**37**	N																																													
700	**38**	Y					Y		Y	Y																		Y					Y				Y									Y	
700	**40**	N																																													
700	**44**	N																																													
700	**45**	N																																													
700	**51**	N																																													
700	**56**	N																																													
700	**57**	N																																													
700	**61**	Y					Y				Y					Y												Y					Y				Y										
700	**63**	Y					Y		Y	Y																		Y					Y				Y										
700	**64**	N																																													
700	**67**	N																																													
700	**70**	Y					Y																					Y					Y				Y									Y	
700	**71**	N																																													
700	**77**	N																																													
700	**83**	N																																													
700	**85**	Y					Y		Y	Y						Y	Y											Y					Y				Y									Y	
700	**91**	N																																													
700	**96**	N																																													
700	**97**	N																																													
700	**98**	N																																													
700	**99**	Y					Y		Y	Y						Y												Y					Y				Y									Y	
700	**102**	N																																													
700	**103**	N																																													
700	**112**	N																																													
700	**113**	Y					Y		Y	Y						Y												Y					Y				Y									Y	
700	**114**	N																																													
700	**115**	N																																													
700	**124**	N																																													
700	**125**	Y					Y		Y	Y						Y												Y					Y				Y									Y	
700	**129**	N																																													
700	**130**	N																																													
700	**131**	N																																													
700	**132**	Y					Y		Y	Y						Y												Y					Y				Y									Y	
700	**134**	N																																													
700	**135**	N																																													
700	**138**	N																																													

Mitigation Table Alternative 2

700	**142**	N																																												
701	**2**	Y					Y		Y	Y						Y													Y																Y	
701	**12**	Y					Y		Y	Y								Y											Y															Y	Y	Y
701	**13**	Y					Y		Y	Y						Y	Y												Y																Y	
701	**16**	N																																												
701	**17**	N																																												
701	**22**	N																																												
701	**30**	N																																												
701	**31**	Y					Y		Y	Y																			Y																Y	
701	**35**	Y					Y		Y	Y						Y	Y												Y																	
701	**37**	Y					Y		Y									Y											Y															Y	Y	Y
701	**47**	Y					Y		Y	Y								Y											Y															Y	Y	Y
701	**54**	N																																												
701	**55**	Y					Y		Y	Y							Y												Y																	
701	**59**	Y					Y		Y								Y												Y															Y	Y	Y
712	**3**	N																																												
712	**8**	N																																												
712	**11**	N																																												
712	**12**	N																																												
712	**16**	N																																												
712	**17**	N																																												
712	**19**	N																																												
712	**20**	N																																												
712	**23**	N																																												
712	**25**	N																																												
712	**28**	N																																												
801	**6**	N																																												
801	**15**	Y					Y										Y												Y																	
801	**16**	N																																												
801	**17**	N																																												
801	**30**	N																																												
801	**31**	Y					Y										Y												Y						Y	Y				Y					Y	Y	Y
801	**32**	N																																												
801	**33**	Y					Y										Y												Y						Y	Y				Y					Y	Y	Y
801	**34**	Y					Y																						Y																		
801	**38**	N																																												
801	**39**	N																																												
801	**40**	N																																												
801	**41**	N																																												
816	**1**	Y					Y				Y						Y												Y																	
816	**2**	N																																												
816	**3**	Y					Y				Y						Y												Y														Y	Y	Y	
816	**5**	Y					Y									Y													Y						Y					Y					Y	
816	**6**	Y					Y									Y													Y																	
816	**12**	Y					Y			Y	Y		Y			Y	Y												Y						Y										Y	
816	**14**	Y					Y																						Y																	
816	**18**	N																																												
816	**22**	N																																												
816	**24**	Y					Y									Y	Y												Y																Y	
816	**26**	N																																												
816	**29**	N																																												
816	**34**	Y					Y										Y												Y																	
816	**44**	N																																												
816	**47**	Y					Y																						Y																	
816	**54**	N																																												
816	**59**	Y					Y									Y													Y																	
816	**61**	Y					Y																						Y																	
816	**63**	N																																												
816	**65**	Y					Y									Y	Y	Y											Y							Y					Y					Y	
816	**69**	Y					Y									Y													Y																	
816	**70**	N																																												
816	**71**	Y					Y		Y							Y													Y																	
816	**72**	N																																												
816	**74**	N																																												
816	**77**	N																																												
816	**82**	N																																												
816	**86**	Y					Y																						Y																	
816	**87**	N																																												
817	**4**	N																																												
817	**6**	N																																												
817	**9**	N																																												
817	**12**	N																																												
817	**13**	N																																												
817	**15**	Y					Y									Y													Y																	
817	**16**	Y					Y									Y													Y																	
817	**18**	Y					Y				Y																		Y																	
817	**21**	Y					Y				Y					Y													Y																	
817	**25**	Y					Y									Y													Y						Y					Y					Y	
817	**26**	N																																												
817	**27**	N																																												
817	**28**	Y					Y									Y													Y						Y					Y					Y	
817	**30**	N																																												
817	**31**	Y					Y				Y					Y	Y												Y																	

Mitigation Table Alternative 2

817	**32**	Y					Y										Y												Y																			
817	**33**	Y					Y									Y	Y												Y																			
817	**39**	Y					Y																						Y							Y					Y					Y		
817	**42**	Y					Y									Y													Y																			
817	**43**	N																																															
817	**45**	Y					Y									Y													Y							Y					Y					Y		
817	**48**	Y					Y		Y	Y			Y	Y		Y													Y							Y					Y					Y		
817	**49**	Y					Y																						Y							Y					Y					Y		
817	**50**	Y					Y									Y													Y																			
817	**51**	N																																															
817	**53**	Y					Y																						Y							Y					Y					Y		
818	**22**	Y					Y										Y												Y							Y					Y					Y		
818	**35**	Y					Y									Y	Y												Y																			
819	**1**	Y					Y									Y	Y												Y							Y					Y					Y		
819	**2**	N																																															
819	**3**	N																																															
819	**4**	Y					Y																						Y																			
819	**6**	N																																															
819	**8**	N																																															
819	**9**	Y					Y										Y												Y																			
819	**10**	Y					Y										Y												Y																			
819	**12**	Y					Y										Y												Y																			
819	**13**	Y					Y						Y			Y	Y												Y																			
819	**17**	N																																															
819	**22**	Y					Y				Y																		Y																			
819	**23**	N																																															
819	**24**	Y					Y		Y					Y		Y													Y																			
819	**25**	N																																															
819	**26**	N																																															
819	**28**	N																																															
819	**29**	N																																															
819	**30**	Y					Y									Y	Y												Y																			
819	**33**	N																																															
819	**36**	Y					Y									Y	Y												Y																			
819	**37**	Y					Y										Y												Y																			
819	**38**	Y					Y									Y	Y												Y																			
819	**40**	N																																															
819	**41**	Y					Y									Y	Y												Y																			
819	**45**	N																																															
819	**47**	Y					Y							Y		Y	Y												Y																			
820	**49**	N																																															
821	**62**	N																																															
821	**63**	N																																															
821	**68**	N																																															
821	**69**	Y					Y		Y									Y											Y																			
821	**71**	N																																															
821	**85**	Y					Y				Y							Y											Y																			
826	**2**	N																																															
826	**3**	N																																															
826	**6**	Y					Y		Y	Y							Y												Y																			
826	**8**	N																																															
826	**9**	Y					Y		Y		Y					Y	Y												Y																			
826	**13**	Y					Y		Y	Y	Y	Y				Y	Y												Y																			
826	**18**	N																																															
826	**19**	N																																															
826	**21**	Y					Y		Y	Y							Y												Y																			
826	**28**	N																																															
826	**31**	N																																															
826	**33**	Y					Y		Y	Y							Y												Y																			
826	**34**	N																																															
826	**44**	N																																															
826	**45**	Y					Y		Y	Y	Y		Y			Y	Y												Y																			
826	**51**	N																																															
826	**57**	Y					Y				Y																		Y																			
826	**59**	N																																															
826	**60**	Y					Y		Y	Y	Y						Y												Y																			
826	**62**	N																																															
826	**63**	N																																															
826	**64**	N																																															
826	**67**	N																																															
826	**68**	N																																															
826	**69**	N																																															
826	**70**	N																																															
826	**75**	N																																															
826	**76**	Y					Y		Y		Y						Y												Y																		Y	
826	**84**	Y					Y		Y	Y	Y																		Y																			
826	**85**	Y					Y		Y		Y																		Y																			
826	**86**	Y					Y		Y		Y							Y											Y																			
826	**88**	Y					Y		Y		Y																		Y																			
826	**89**	Y					Y		Y		Y																		Y																			
826	**90**	Y					Y		Y	Y	Y						Y												Y																			
827	**2**	N																																															
827	**14**	Y					Y		Y	Y	Y			Y	Y	Y													Y																			

Mitigation Table Alternative 2

827	**15**	N																																													
827	**16**	N																																													
827	**18**	N																																													
827	**24**	N																																													
827	**30**	N																																													
827	**33**	N																																													
827	**34**	N																																													
827	**40**	Y					Y		Y	Y				Y																Y																	
827	**41**	Y					Y		Y	Y	Y						Y													Y																Y	
827	**51**	N																																													
827	**58**	N																																													
827	**59**	Y					Y		Y	Y	Y			Y	Y	Y														Y																	
827	**60**	Y					Y		Y	Y			Y			Y														Y															Y		
827	**61**	Y					Y		Y							Y														Y																	
827	**65**	N																																													
827	**66**	Y					Y		Y	Y						Y	Y													Y																	
827	**67**	Y					Y		Y	Y						Y														Y																	
827	**68**	N																																													
827	**69**	Y					Y		Y		Y						Y													Y																	
827	**71**	N																																													
828	**12**	N																																													
828	**15**	N																																													
828	**17**	N																																													
828	**31**	N																																													
828	**33**	Y					Y		Y							Y	Y													Y																	
828	**52**	N																																													
828	**53**	N																																													
829	**8**	N																																													
829	**9**	Y					Y		Y	Y																				Y																	
829	**10**	N																																													
829	**24**	N																																													
830	**21**	Y					Y										Y													Y															Y	Y	Y
830	**22**	Y					Y																							Y															Y	Y	Y
830	**29**	Y					Y				Y						Y													Y																	
830	**43**	Y					Y									Y														Y																	
830	**61**	Y					Y																							Y																	
830	**62**	Y					Y																							Y															Y	Y	Y
830	**66**	Y					Y									Y														Y																	
830	**70**	Y					Y																							Y																Y	
831	**4**	Y					Y							Y		Y														Y															Y	Y	Y
831	**12**	Y					Y																							Y															Y	Y	Y
831	**13**	Y					Y																							Y																	
831	**15**	Y					Y		Y	Y	Y					Y														Y																	
831	**30**	Y					Y		Y					Y		Y														Y																	
831	**37**	Y					Y							Y		Y														Y																	
831	**40**	Y					Y																							Y																	
831	**42**	Y					Y																							Y																	
831	**43**	Y					Y																							Y																	
831	**51**	Y					Y		Y					Y		Y														Y																	
833	**3**	Y					Y		Y							Y														Y																Y	
833	**23**	Y					Y		Y	Y						Y														Y																Y	
833	**35**	Y					Y									Y		Y												Y																	
833	**37**	Y					Y									Y														Y																	
833	**43**	Y					Y			Y	Y					Y														Y																	
833	**57**	Y					Y											Y												Y																Y	
833	**70**	N																																													
833	**77**	Y					Y									Y														Y																	
833	**102**	Y					Y				Y					Y		Y												Y																	
833	**116**	Y					Y			Y	Y					Y														Y																	
833	**120**	Y					Y		Y							Y														Y																	
833	**122**	Y					Y			Y	Y					Y														Y																	
833	**132**	Y					Y									Y														Y																	
834	**19**	Y					Y				Y			Y		Y	Y													Y																	
835	**28**	Y					Y				Y						Y													Y																Y	
841	**23**	Y					Y				Y					Y	Y													Y																	
841	**25**	Y					Y						Y			Y	Y													Y																	
841	**33**	Y					Y									Y	Y													Y						Y				Y						Y	Y
841	**35**	Y					Y									Y	Y													Y						Y				Y						Y	Y
841	**46**	Y					Y				Y						Y													Y																	
841	**51**	Y					Y										Y													Y																	
841	**54**	Y					Y				Y						Y													Y																	
841	**85**	Y					Y				Y					Y	Y													Y																	
842	**5**	Y					Y									Y	Y													Y																Y	
842	**32**	Y					Y									Y	Y													Y																	
842	**74**	Y					Y									Y	Y													Y																	
844	**12**	Y					Y										Y													Y																	
844	**15**	Y					Y									Y														Y																	
844	**17**	Y					Y									Y	Y													Y																	
844	**29**	Y					Y				Y					Y														Y																	
844	**38**	Y					Y										Y													Y																	
844	**40**	Y					Y									Y	Y													Y																	
844	**42**	Y					Y										Y													Y																	
844	**60**	Y					Y		Y							Y														Y																	

Mitigation Table Alternative 2

844	64	Y					Y										Y												Y																			
844	75	Y					Y									Y	Y												Y																			
852	39	N																																															
853	1	Y					Y				Y						Y												Y																			
853	2	N																																															
853	28	N																																															
853	34	N																																															
853	40	N																																															
853	41	Y					Y		Y		Y					Y	Y												Y														Y						
853	43	Y					Y				Y						Y												Y																				
853	44	N																																															
853	45	Y					Y				Y									Y									Y														Y						
853	46	N																																															
853	47	N																																															
853	52	N																																															
854	8	N																																															
854	10	N																																															
854	13	N																																															
854	15	N																																															
854	18	Y					Y		Y	Y	Y						Y												Y																			
854	21	Y					Y																						Y																			
854	24	N																																															
854	26	N																																															
854	27	N																																															
854	28	N																																															
854	33	Y					Y				Y						Y												Y																			
854	35	N																																															
854	37	Y					Y			Y							Y												Y																			
854	39	N																																															
854	40	N																																															
854	57	N																																															
854	59	N																																															
854	60	Y					Y			Y							Y												Y																			
854	62	N																																															
865	25	Y					Y																						Y																			
865	52	Y					Y		Y		Y		Y			Y		Y											Y																		Y	
865	67	Y					Y		Y	Y			Y			Y													Y																		Y	
865	77	Y					Y		Y		Y					Y													Y																		Y	
866	2	Y					Y		Y		Y			Y	Y	Y	Y																															
866	6	N																																															
866	12	Y					Y									Y	Y												Y																			
866	31	N																																															
866	44	Y					Y		Y	Y						Y	Y												Y																			
866	45	Y					Y				Y					Y	Y												Y																			
868	5	Y					Y			Y	Y						Y												Y																			
868	13	N																																															
868	14	N																																															
868	16	N																																															
868	20	Y					Y										Y												Y																			
868	27	N																																															
868	28	N																																															
869	1	Y					Y				Y					Y	Y												Y																			
869	5	Y					Y										Y	Y											Y																			
869	8	Y					Y																						Y																			
869	9	N																																															
869	11	N																																															
869	13	Y					Y		Y	Y	Y						Y												Y																			
869	20	N																																															
869	21	N																																															
869	25	N																																															
870	4	Y					Y									Y	Y												Y																			
870	8	Y					Y		Y		Y						Y												Y																			
870	76	N																																															
870	80	Y					Y		Y																				Y																			
871	6	Y					Y		Y																				Y																			
871	8	Y					Y		Y	Y																			Y																			
871	12	Y					Y				Y							Y											Y																		Y	
871	17	Y					Y																						Y																			
871	18	Y					Y		Y	Y	Y																		Y																			
871	21	Y					Y		Y	Y										Y									Y																		Y	
871	45	Y					Y																						Y																		Y	
871	46	Y					Y				Y							Y											Y																		Y	
871	51	Y					Y		Y	Y	Y		Y																Y																			
871	63	Y					Y		Y	Y	Y		Y																Y																		Y	
871	65	Y					Y		Y	Y																			Y																		Y	
871	66	Y					Y		Y	Y			Y																Y																			
871	68	Y					Y			Y																			Y																			
871	88	Y					Y		Y	Y			Y			Y													Y																			
871	92	Y					Y		Y	Y			Y																Y																			
871	96	Y					Y		Y	Y			Y																Y																		Y	
871	101	Y					Y		Y	Y																			Y																			
871	106	Y					Y		Y	Y																			Y																		Y	
872	15	Y					Y		Y		Y			Y	Y	Y													Y																			

Mitigation Table Alternative 2

872	**18**	Y					Y				Y			Y	Y	Y													Y																		
873	**3**	Y					Y		Y								Y												Y																		
873	**22**	Y					Y		Y								Y												Y																		
873	**24**	Y					Y		Y		Y						Y												Y																		
882	**10**	N																																													
882	**11**	N																																													
882	**12**	Y					Y		Y	Y																			Y																	Y	
882	**19**	Y					Y		Y	Y			Y																Y																		
882	**21**	Y					Y		Y	Y																			Y																	Y	
882	**36**	Y					Y		Y	Y						Y													Y																		
882	**80**	N																																													
882	**89**	N																																													
882	**91**	N																																													

Mitigation Table Alternative 3

Compartment	Stand	Wlin A3	VE1	VE2	VE3	VE4	VE5	VE6	S1	S2	S3	S4	S5	WA1	WA2	WA3	G1	H1	WL1	WL2	WL3	WL4	WL5	WL6	WL7	WL8	WL10	WL11	WL12	WL13	WL14	WL15	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	VS 1 buffer	VS 2 land	VS 3 slash	VS 4 leaf off
309	3	Y	Y				Y			Y		Y	Y					Y												Y																		
309	10	Y					Y			Y		Y	Y			Y														Y																		
309	11	Y	Y			Y	Y			Y	Y		Y			Y														Y																		
310	10	Y	Y				Y		Y																					Y																		
439	13	Y	Y	Y		Y	Y		Y									Y											Y	Y																		
439	41	Y	Y				Y							Y	Y	Y			Y										Y	Y						Y					Y						Y	
440	19	Y					Y	Y	Y																				Y	Y																		
440	40	Y	Y				Y	Y	Y																				Y	Y							Y										Y	
445	5	Y					Y		Y																		Y																			Y	Y	Y
445	9	Y	Y	Y			Y	Y																						Y																		
445	10	Y					Y				Y																Y																					
445	14	Y					Y		Y					Y	Y	Y											Y																			Y	Y	Y
445	16	Y		Y		Y	Y	Y	Y					Y	Y	Y														Y																		
484	5	Y	Y	Y			Y	Y			Y																Y																					
484	8	Y		Y			Y	Y			Y																Y																					
484	15	N																																														
484	29	Y		Y			Y	Y			Y																Y																					
484	30	Y					Y		Y																		Y																					
484	31	Y					Y	Y			Y										Y						Y																					
484	32	Y		Y			Y	Y			Y																																					
484	33	Y					Y	Y																					Y																			
484	43	Y		Y			Y				Y																Y																					
484	44	Y		Y			Y	Y			Y							Y									Y																					
484	45	Y					Y	Y													Y								Y																			
484	46	Y	Y				Y	Y			Y										Y								Y																			
484	48	Y					Y	Y																					Y																			
484	49	Y					Y																						Y																			
484	52	Y					Y				Y																Y																					
485	1	Y	Y			Y	Y	Y	Y							Y													Y	Y																		
485	25	Y					Y		Y			Y																	Y	Y																		
485	28	Y	Y				Y	Y													Y								Y	Y																		
485	43	Y					Y	Y			Y																																					
492	19	Y					Y				Y																																					
492	20	Y	Y				Y				Y													Y					Y	Y																		
493	9	Y	Y				Y				Y																																					
493	10	Y	Y			Y	Y				Y			Y	Y	Y		Y																														
639	2	Y					Y		Y																				Y																			
639	5	Y	Y	Y			Y		Y																					Y																		
639	7	Y					Y		Y		Y																		Y																			
639	10	Y					Y																						Y																			
639	17	Y					Y		Y																				Y																			
639	64	Y					Y		Y																				Y																		Y	
639	67	Y					Y				Y																		Y																		Y	
641	26	Y					Y	Y	Y	Y																			Y	Y																		
641	31	Y					Y		Y																				Y	Y																		
641	42	Y			Y	Y	Y	Y	Y																				Y	Y															Y		Y	
641	44	Y			Y		Y																						Y							Y				Y							Y	
641	82	Y					Y	Y										Y									Y	Y							Y												
641	86	Y			Y	Y	Y	Y						Y	Y	Y													Y	Y						Y				Y							Y	
641	166	Y			Y		Y		Y																					Y															Y		Y	
641	170	N																																														
642	1	Y					Y						Y			Y		Y											Y																	Y	
642	4	Y					Y		Y				Y			Y													Y																	Y	
642	6	Y					Y		Y																				Y																			
642	13	Y					Y		Y							Y	Y												Y																			
642	16	Y					Y		Y		Y		Y	Y	Y	Y													Y																			
642	17	Y					Y		Y				Y	Y	Y	Y													Y																			
642	18	Y					Y		Y		Y					Y													Y																		Y	
642	21	Y	Y				Y		Y																				Y																		Y	
642	23	Y					Y		Y																				Y																			
642	24	Y					Y		Y																				Y																		Y	
642	25	Y					Y		Y		Y		Y	Y	Y	Y													Y																			
642	27	Y				Y	Y		Y																				Y	Y																		
642	29	Y	Y		Y		Y	Y	Y																				Y	Y							Y								Y		Y	
642	30	Y		Y		Y	Y		Y																					Y																		
651	19	Y					Y																						Y	Y																		
651	25	Y					Y			Y			Y			Y													Y																			
651	30	Y					Y																				Y	Y																				
651	78	Y					Y			Y			Y			Y													Y																		Y	
675	14	Y					Y		Y																																							
675	16	Y					Y																						Y	Y																		
675	20	Y					Y		Y																				Y																		Y	
675	21	Y					Y		Y																				Y																		Y	
675	27	Y					Y		Y																				Y																			
675	41	Y					Y																						Y																		Y	
675	42	Y					Y		Y																				Y																		Y	
675	43	Y					Y		Y				Y			Y													Y																		Y	

Mitigation Table Alternative 3

675	**44**	Y					Y																							Y																		Y	
675	**45**	Y					Y		Y								Y													Y																			
675	**50**	Y					Y		Y																					Y																			
675	**51**	N																																														
675	**53**	Y					Y		Y					Y	Y	Y		Y												Y																			
675	**58**	N																																														
675	**60**	Y					Y		Y	Y																			Y																		Y	Y	Y
675	**61**	N																																														
675	**64**	Y					Y		Y	Y	Y		Y				Y													Y																			
675	**66**	Y					Y		Y																					Y																		Y	
675	**67**	Y				Y	Y		Y								Y													Y	Y																		
675	**72**	Y					Y		Y																					Y																			
675	**78**	N																																														
675	**79**	N																																														
675	**87**	Y					Y																							Y																			
675	**92**	Y					Y																							Y	Y																		
675	**103**	Y					Y		Y	Y																				Y																	Y	Y	
675	**104**	Y					Y		Y																					Y																			
675	**107**	Y					Y		Y																					Y																			
675	**110**	Y					Y																							Y																			
675	**112**	Y					Y		Y																					Y	Y																		
684	**1**	N																																														
684	**11**	N																																														
684	**14**	N																																														
684	**18**	N																																														
684	**28**	N																																														
684	**29**	N																																														
684	**30**	N																																														
684	**31**	N																																														
684	**32**	N																																														
684	**35**	N																																														
684	**56**	N																																														
684	**57**	N																																														
700	**2**	Y	Y	Y		Y	Y		Y	Y							Y												Y	Y															Y	Y	Y	Y
700	**8**	Y	Y	Y			Y		Y	Y									Y												Y					Y			Y	Y	Y				Y		Y	Y	Y
700	**9**	Y					Y																								Y					Y				Y	Y						Y	Y	Y
700	**13**	Y	Y	Y			Y											Y														Y							Y						Y			Y	
700	**14**	Y	Y			Y	Y		Y								Y												Y	Y																		
700	**16**	Y					Y																							Y					Y				Y	Y								Y	
700	**18**	Y					Y		Y	Y																					Y					Y				Y								Y	
700	**21**	Y					Y		Y	Y							Y														Y					Y				Y								Y	
700	**22**	Y					Y		Y	Y							Y												Y							Y				Y								Y	
700	**25**	Y				Y	Y		Y	Y							Y																			Y				Y									
700	**32**	Y					Y		Y	Y			Y				Y												Y																			Y	
700	**34**	Y					Y		Y	Y			Y				Y														Y					Y				Y									
700	**35**	Y	Y			Y	Y		Y								Y														Y	Y				Y				Y									
700	**37**	Y					Y		Y	Y																					Y					Y				Y									
700	**38**	Y	Y				Y		Y	Y																					Y	Y				Y				Y					Y			Y	
700	**40**	Y					Y																													Y				Y									
700	**44**	Y	Y	Y		Y	Y		Y	Y							Y												Y	Y						Y				Y									
700	**45**	Y					Y		Y	Y							Y	Y											Y							Y				Y								Y	
700	**51**	N																																														
700	**56**	N																																														
700	**57**	Y		Y			Y		Y									Y														Y			Y					Y									
700	**61**	Y				Y	Y				Y						Y															Y				Y				Y									
700	**63**	Y					Y		Y	Y																				Y						Y				Y									
700	**64**	N																																														
700	**67**	N																																														
700	**70**	Y					Y																							Y					Y				Y								Y	
700	**71**	Y	Y	Y		Y	Y		Y								Y															Y			Y				Y	Y					Y			Y	
700	**77**	N																																														
700	**83**	Y					Y		Y	Y							Y														Y					Y				Y									
700	**85**	Y					Y		Y	Y							Y	Y													Y					Y				Y								Y	
700	**91**	N																																														
700	**96**	Y					Y		Y	Y																					Y					Y				Y								Y	
700	**97**	Y	Y				Y		Y	Y																					Y					Y				Y								Y	
700	**98**	Y					Y																								Y					Y				Y								Y	
700	**99**	Y					Y		Y	Y							Y														Y					Y				Y								Y	
700	**102**	Y					Y		Y								Y												Y							Y				Y								Y	
700	**103**	Y					Y		Y	Y				Y	Y		Y														Y					Y				Y									
700	**112**	N																																														
700	**113**	Y	Y			Y	Y		Y	Y							Y														Y	Y				Y				Y					Y			Y	
700	**114**	Y					Y		Y	Y							Y														Y					Y				Y								Y	
700	**115**	Y					Y		Y	Y							Y												Y							Y				Y									
700	**124**	N																																														
700	**125**	Y					Y		Y	Y							Y														Y					Y				Y								Y	
700	**129**	Y	Y				Y		Y	Y																				Y						Y				Y									
700	**130**	Y		Y			Y											Y														Y			Y					Y									
700	**131**	Y	Y	Y		Y	Y										Y	Y														Y			Y				Y	Y					Y			Y	
700	**132**	Y					Y		Y	Y							Y												Y	Y						Y				Y								Y	
700	**134**	Y					Y		Y	Y							Y														Y					Y				Y									
700	**135**	Y	Y				Y																						Y							Y	Y	Y		Y					Y			Y	
700	**138**	Y	Y			Y	Y			Y							Y													Y						Y			Y	Y					Y			Y	

Mitigation Table Alternative 3

700	**142**	Y					Y		Y	Y						Y											Y																	Y	Y	Y
701	**2**	Y					Y		Y	Y						Y													Y																	Y	
701	**12**	Y					Y		Y	Y								Y											Y																Y	Y	Y
701	**13**	Y	Y	Y		Y	Y		Y	Y						Y	Y										Y	Y																Y		Y	
701	**16**	Y					Y		Y								Y											Y						Y		Y		Y								Y	
701	**17**	Y					Y		Y	Y																	Y				Y	Y				Y									Y	Y	Y
701	**22**	N																																													
701	**30**	Y	Y			Y	Y		Y	Y																		Y																Y	Y	Y	Y
701	**31**	Y					Y		Y	Y																			Y																	Y	
701	**35**	Y	Y	Y		Y	Y		Y	Y						Y	Y										Y	Y																		
701	**37**	Y	Y	Y	Y		Y		Y									Y											Y															Y	Y	Y	Y
701	**47**	Y					Y		Y	Y								Y											Y																Y	Y	Y
701	**54**	Y					Y		Y	Y				Y	Y	Y											Y																		Y	Y	Y
701	**55**	Y	Y	Y			Y		Y	Y							Y				Y						Y	Y																		
701	**59**	Y	Y	Y			Y		Y								Y													Y																Y	Y	Y
712	**3**	N																																													
712	**8**	N																																													
712	**11**	N																																													
712	**12**	N																																													
712	**16**	N																																													
712	**17**	Y	Y	Y		Y	Y		Y	Y			Y			Y	Y	Y									Y	Y															Y		Y	Y
712	**19**	N																																													
712	**20**	N																																													
712	**23**	N																																													
712	**25**	N																																													
712	**28**	Y	Y	Y	Y	Y	Y									Y	Y	Y											Y															Y		Y	Y
801	**6**	N																																													
801	**15**	N																																													
801	**16**	N																																													
801	**17**	N																																													
801	**30**	N																																													
801	**31**	N																																													
801	**32**	N																																													
801	**33**	N																																													
801	**34**	Y					Y																						Y	Y																	
801	**38**	N																																													
801	**39**	N																																													
801	**40**	N																																													
801	**41**	N																																													
816	**1**	N																																													
816	**2**	N																																													
816	**3**	N																																													
816	**5**	Y	Y				Y									Y													Y	Y						Y	Y				Y		Y			Y	
816	**6**	N																																													
816	**12**	Y	Y	Y	Y	Y	Y	Y		Y	Y		Y			Y	Y												Y							Y								Y	Y	Y	
816	**14**	N																																													
816	**18**	Y					Y		Y				Y			Y											Y								Y										Y	
816	**22**	Y					Y																				Y																			Y	
816	**24**	N																																													
816	**26**	Y					Y									Y											Y																			Y	
816	**29**	Y					Y									Y											Y																				
816	**34**	Y	Y	Y			Y	Y									Y												Y	Y																	
816	**44**	N																																													
816	**47**	N																																													
816	**54**	N																																													
816	**59**	Y				Y	Y									Y													Y	Y																	
816	**61**	Y					Y																						Y	Y																	
816	**63**	Y					Y																				Y																				
816	**65**	Y	Y	Y	Y	Y	Y									Y	Y	Y											Y	Y						Y	Y				Y					Y	
816	**69**	Y				Y	Y									Y													Y	Y																	
816	**70**	Y				Y	Y									Y											Y																				
816	**71**	Y				Y	Y									Y													Y																		
816	**72**	Y					Y									Y											Y																				
816	**74**	N																																													
816	**77**	N																																													
816	**82**	N																																													
816	**86**	N																																													
816	**87**	Y					Y																				Y																				
817	**4**	N																																													
817	**6**	N																																													
817	**9**	Y					Y									Y	Y										Y														Y					Y	
817	**12**	Y					Y										Y	Y									Y																				
817	**13**	Y					Y		Y	Y		Y	Y			Y																														Y	
817	**15**	Y					Y									Y													Y																		
817	**16**	N																																													
817	**18**	N																																													
817	**21**	N																																													
817	**25**	N																																													
817	**26**	Y	Y			Y	Y		Y	Y			Y			Y													Y							Y	Y				Y		Y			Y	
817	**27**	N																																													
817	**28**	N																																													
817	**30**	N																																													
817	**31**	N																																													

Mitigation Table Alternative 3

817	**32**	N																																														
817	**33**	N																																														
817	**39**	Y	Y				Y																					Y	Y								Y	Y				Y					Y	
817	**42**	Y					Y									Y														Y																		
817	**43**	N																																														
817	**45**	Y					Y									Y														Y							Y					Y					Y	
817	**48**	N																																														
817	**49**	N																																														
817	**50**	N																																														
817	**51**	N																																														
817	**53**	Y					Y																							Y							Y					Y					Y	
818	**22**	Y	Y	Y			Y										Y													Y							Y					Y		Y			Y	
818	**35**	Y	Y	Y		Y	Y									Y	Y											Y																			
819	**1**	Y	Y	Y		Y	Y									Y	Y													Y	Y						Y	Y				Y		Y			Y	
819	**2**	Y					Y										Y													Y							Y					Y					Y	
819	**3**	N																																														
819	**4**	Y	Y	Y			Y										Y											Y																			
819	**6**	Y					Y										Y											Y									Y					Y					Y	
819	**8**	Y					Y		Y	Y		Y	Y			Y	Y																															
819	**9**	N																																														
819	**10**	N																																														
819	**12**	N																																														
819	**13**	Y	Y	Y			Y						Y			Y	Y													Y	Y																	
819	**17**	N																																														
819	**22**	N																																														
819	**23**	N																																														
819	**24**	N																																														
819	**25**	N																																														
819	**26**	N																																														
819	**28**	N																																														
819	**29**	N																																														
819	**30**	N																																														
819	**33**	N																																														
819	**36**	N																																														
819	**37**	N																																														
819	**38**	N																																														
819	**40**	Y					Y																																									
819	**41**	N																																														
819	**45**	N																																														
819	**47**	N																																														
820	**49**	Y					Y		Y	Y			Y	Y		Y	Y											Y																	Y	Y	
821	**62**	Y	Y	Y			Y		Y	Y							Y											Y																				
821	**63**	Y					Y		Y	Y							Y											Y																				
821	**68**	N																																														
821	**69**	N																																														
821	**71**	N																																														
821	**85**	N																																														
826	**2**	N																																														
826	**3**	N																																														
826	**6**	N																																														
826	**8**	N																																														
826	**9**	N																																														
826	**13**	N																																														
826	**18**	N																																														
826	**19**	N																																														
826	**21**	N																																														
826	**28**	N																																														
826	**31**	N																																														
826	**33**	N																																														
826	**34**	Y					Y																																									
826	**44**	N																																														
826	**45**	N																																														
826	**51**	N																																														
826	**57**	N																																														
826	**59**	N																																														
826	**60**	N																																														
826	**62**	N																																														
826	**63**	N																																														
826	**64**	N																																														
826	**67**	N																																														
826	**68**	N																																														
826	**69**	N																																														
826	**70**	N																																														
826	**75**	Y					Y		Y	Y	Y						Y											Y																			Y	
826	**76**	Y					Y		Y		Y						Y													Y																	Y	
826	**84**	N																																														
826	**85**	N																																														
826	**86**	N																																														
826	**88**	N																																														
826	**89**	Y					Y		Y		Y																				Y																	
826	**90**	Y		Y			Y	Y	Y	Y	Y						Y													Y	Y																	
827	**2**	Y					Y		Y	Y						Y	Y											Y								Y					Y					Y	
827	**14**	Y					Y		Y	Y	Y			Y	Y	Y														Y																	

Mitigation Table Alternative 3

827	**15**	N																																														
827	**16**	Y					Y		Y		Y		Y	Y	Y	Y	Y												Y																		
827	**18**	Y					Y		Y	Y	Y					Y		Y										Y																				
827	**24**	N																																														
827	**30**	Y					Y		Y		Y						Y											Y																				
827	**33**	N																																														
827	**34**	N																																														
827	**40**	Y					Y		Y	Y				Y															Y	Y																	
827	**41**	Y					Y		Y	Y	Y						Y												Y																	Y	
827	**51**	N																																														
827	**58**	Y					Y		Y	Y	Y					Y	Y											Y																			
827	**59**	Y					Y		Y	Y	Y			Y	Y	Y													Y																		
827	**60**	Y					Y		Y	Y			Y			Y													Y																Y	Y	
827	**61**	Y					Y		Y							Y													Y																		
827	**65**	N																																														
827	**66**	Y	Y	Y		Y	Y		Y	Y						Y	Y												Y	Y																	
827	**67**	Y	Y			Y	Y		Y	Y						Y													Y	Y																	
827	**68**	Y					Y		Y	Y							Y											Y																			
827	**69**	Y		Y			Y		Y		Y						Y											Y	Y																		
827	**71**	Y					Y		Y								Y											Y																			
828	**12**	N																																														
828	**15**	Y					Y		Y								Y													Y																Y	
828	**17**	N																																														
828	**31**	Y	Y	Y		Y	Y		Y				Y			Y														Y																	
828	**33**	Y		Y		Y	Y		Y							Y	Y											Y	Y																		
828	**52**	N																																														
828	**53**	N																																														
829	**8**	Y					Y		Y	Y							Y											Y																			
829	**9**	Y					Y		Y	Y																		Y	Y																		
829	**10**	Y					Y		Y								Y											Y																			
829	**24**	Y					Y		Y	Y																		Y																			
830	**21**	Y					Y										Y												Y																	Y	
830	**22**	Y					Y																						Y																	Y	
830	**29**	Y					Y				Y						Y												Y																		
830	**43**	Y					Y									Y													Y																		
830	**61**	Y					Y																						Y																		
830	**62**	Y					Y																						Y																	Y	
830	**66**	Y	Y			Y	Y									Y													Y	Y																	
830	**70**	Y					Y																						Y																	Y	
831	**4**	Y					Y							Y		Y													Y																	Y	
831	**12**	Y					Y																						Y																	Y	
831	**13**	Y					Y																						Y																		
831	**15**	Y					Y		Y	Y	Y					Y													Y																		
831	**30**	Y					Y		Y					Y		Y													Y																		
831	**37**	Y					Y							Y		Y													Y																		
831	**40**	Y					Y																						Y																		
831	**42**	Y					Y																						Y																		
831	**43**	Y					Y																						Y																		
831	**51**	Y					Y		Y					Y		Y													Y																		
833	**3**	Y					Y		Y							Y													Y																	Y	
833	**23**	Y	Y			Y	Y		Y	Y						Y													Y	Y																Y	
833	**35**	Y					Y									Y		Y																													
833	**37**	Y					Y									Y													Y	Y																	
833	**43**	Y					Y			Y	Y					Y													Y																		
833	**57**	Y					Y											Y											Y																	Y	
833	**70**	Y	Y			Y	Y									Y		Y																											Y	
833	**77**	Y	Y			Y	Y									Y													Y	Y																	
833	**102**	N																																														
833	**116**	Y					Y			Y	Y					Y													Y																		
833	**120**	Y					Y		Y							Y													Y																		
833	**122**	Y					Y			Y	Y					Y													Y																		
833	**132**	Y				Y	Y									Y													Y	Y																	
834	**19**	Y					Y				Y			Y		Y	Y												Y																		
835	**28**	Y	Y	Y	Y		Y				Y						Y												Y	Y																Y	
841	**23**	Y	Y	Y	Y	Y	Y				Y					Y	Y												Y	Y																	
841	**25**	Y					Y						Y			Y	Y												Y																		
841	**33**	Y	Y	Y		Y	Y									Y	Y												Y	Y					Y	Y			Y			Y			Y		
841	**35**	Y	Y	Y		Y	Y									Y	Y												Y	Y					Y	Y			Y			Y			Y		
841	**46**	Y	Y	Y			Y										Y												Y	Y																	
841	**51**	Y	Y	Y			Y										Y												Y	Y																	
841	**54**	Y	Y		Y		Y				Y						Y												Y	Y																	
841	**85**	Y					Y				Y					Y	Y												Y																		
842	**5**	Y	Y	Y		Y	Y									Y	Y												Y	Y						Y						Y			Y		
842	**32**	Y	Y	Y			Y									Y	Y													Y																	
842	**74**	Y	Y	Y			Y									Y	Y													Y																	
844	**12**	Y					Y										Y												Y																		
844	**15**	Y					Y									Y													Y																		
844	**17**	Y					Y									Y	Y												Y																		
844	**29**	Y	Y			Y	Y				Y					Y													Y																		
844	**38**	Y	Y	Y			Y										Y													Y																	
844	**40**	Y	Y	Y		Y	Y									Y	Y													Y																	
844	**42**	Y	Y	Y			Y										Y													Y																	
844	**60**	Y					Y		Y							Y													Y																		

Mitigation Table Alternative 3

844	**64**	Y					Y										Y												Y																			
844	**75**	Y	Y	Y		Y	Y									Y	Y													Y																		
852	**39**	Y					Y										Y											Y																				
853	**1**	Y					Y				Y						Y												Y																			
853	**2**	Y					Y			Y	Y						Y			Y									Y												Y				Y	
853	**28**	Y					Y		Y		Y																		Y												Y					
853	**34**	Y	Y	Y			Y		Y	Y																				Y																	
853	**40**	Y		Y			Y				Y									Y									Y	Y																	
853	**41**	Y					Y		Y		Y					Y	Y												Y												Y					
853	**43**	Y		Y			Y				Y						Y												Y	Y																	
853	**44**	Y					Y			Y	Y					Y	Y												Y												Y				Y	
853	**45**	Y					Y				Y									Y									Y	Y											Y					
853	**46**	Y	Y	Y			Y				Y						Y			Y									Y	Y											Y					
853	**47**	Y		Y			Y		Y		Y						Y	Y											Y	Y											Y				Y	
853	**52**	Y					Y			Y																			Y	Y																	
854	**8**	Y		Y			Y																							Y																	
854	**10**	Y					Y			Y							Y												Y																Y	
854	**13**	Y	Y	Y		Y	Y	Y		Y	Y		Y			Y	Y												Y	Y																	
854	**15**	Y		Y			Y	Y	Y	Y	Y						Y												Y	Y																	
854	**18**	Y	Y	Y			Y	Y	Y	Y	Y						Y												Y	Y																	
854	**21**	N																																														
854	**24**	Y	Y	Y			Y	Y		Y							Y												Y	Y																	
854	**26**	Y					Y		Y	Y																			Y															Y			
854	**27**	Y	Y	Y			Y	Y		Y	Y						Y												Y	Y																	
854	**28**	Y					Y	Y	Y	Y																																					
854	**33**	Y					Y				Y						Y												Y																		
854	**35**	Y		Y			Y				Y						Y												Y	Y	Y	Y															
854	**37**	Y					Y			Y							Y												Y																		
854	**39**	Y		Y			Y	Y									Y												Y	Y																	
854	**40**	Y		Y			Y	Y																																							
854	**57**	Y		Y			Y	Y																						Y																	
854	**59**	Y	Y	Y			Y	Y		Y	Y						Y												Y	Y																	
854	**60**	Y					Y			Y							Y												Y																		
854	**62**	Y					Y		Y	Y	Y						Y												Y																		
865	**25**	Y					Y																						Y																		
865	**52**	Y					Y		Y		Y		Y			Y		Y											Y																Y	
865	**67**	Y	Y	Y	Y	Y	Y		Y	Y			Y			Y													Y	Y																Y	
865	**77**	Y					Y		Y		Y					Y													Y																	Y	
866	**2**	Y		Y		Y	Y		Y		Y			Y	Y	Y	Y													Y																	
866	**6**	Y		Y		Y	Y							Y	Y	Y	Y													Y																	
866	**12**	Y		Y		Y	Y	Y								Y	Y													Y																	
866	**31**	Y	Y	Y			Y		Y	Y	Y		Y				Y													Y														Y			Y
866	**44**	Y		Y		Y	Y		Y	Y						Y	Y												Y																	
866	**45**	Y		Y		Y	Y	Y			Y					Y	Y													Y																	
868	**5**	Y	Y	Y			Y	Y		Y	Y						Y												Y	Y																	
868	**13**	Y					Y			Y	Y					Y	Y	Y											Y																	
868	**14**	Y	Y	Y			Y			Y	Y						Y												Y	Y															Y	
868	**16**	Y					Y			Y	Y						Y												Y																Y	
868	**20**	Y		Y			Y										Y												Y																		
868	**27**	Y	Y			Y	Y	Y	Y				Y			Y													Y	Y																	
868	**28**	Y		Y		Y	Y	Y	Y	Y			Y			Y	Y												Y	Y																	
869	**1**	N																																														
869	**5**	Y					Y										Y	Y											Y																		
869	**8**	Y		Y			Y										Y												Y	Y																	
869	**9**	Y					Y			Y	Y					Y	Y												Y																		
869	**11**	Y					Y		Y								Y												Y																		
869	**13**	Y		Y			Y		Y	Y	Y						Y												Y	Y																	
869	**20**	Y		Y			Y			Y	Y						Y												Y	Y																	
869	**21**	Y		Y			Y			Y							Y												Y	Y																	
869	**25**	Y					Y			Y	Y			Y	Y	Y	Y												Y																		
870	**4**	Y		Y		Y	Y	Y								Y	Y													Y																	
870	**8**	Y		Y		Y	Y	Y	Y		Y						Y													Y																	
870	**76**	Y				Y	Y	Y						Y	Y	Y														Y																	
870	**80**	Y					Y		Y																			Y																			
871	**6**	Y		Y			Y		Y																				Y	Y																	
871	**8**	Y					Y	Y	Y	Y																			Y																		
871	**12**	Y	Y		Y		Y	Y			Y							Y												Y														Y		Y	
871	**17**	Y	Y	Y			Y																						Y	Y																	
871	**18**	Y					Y	Y	Y	Y	Y																		Y	Y																	
871	**21**	Y					Y		Y	Y										Y									Y																Y	
871	**45**	Y	Y	Y	Y		Y	Y																					Y	Y																Y	
871	**46**	Y	Y	Y	Y		Y	Y			Y							Y											Y	Y														Y		Y	
871	**51**	Y					Y	Y	Y	Y	Y		Y																Y	Y																	
871	**63**	Y	Y		Y		Y	Y	Y	Y	Y		Y																Y																	Y	
871	**65**	Y					Y		Y	Y																			Y																	Y	
871	**66**	Y		Y			Y	Y	Y	Y			Y																Y	Y																	
871	**68**	Y		Y			Y	Y		Y																			Y	Y																	
871	**88**	Y		Y		Y	Y		Y	Y			Y			Y													Y	Y																	
871	**92**	Y	Y	Y	Y		Y	Y	Y	Y			Y																Y																		
871	**96**	Y	Y	Y	Y		Y	Y	Y	Y			Y																Y																	Y	
871	**101**	Y		Y			Y	Y	Y	Y																			Y	Y																	
871	**106**	Y	Y	Y			Y		Y	Y																			Y	Y																Y	
872	**15**	Y					Y		Y		Y			Y	Y	Y													Y																		

Mitigation Table Alternative 3

872	**18**	Y					Y				Y			Y	Y	Y														Y																	
873	**3**	Y		Y	Y		Y		Y								Y														Y																
873	**22**	Y					Y		Y								Y													Y																	
873	**24**	Y					Y		Y		Y						Y													Y																	
882	**10**	Y					Y		Y	Y																		Y																		Y	
882	**11**	Y					Y		Y	Y																		Y																		Y	
882	**12**	Y	Y		Y		Y		Y	Y																				Y	Y															Y	
882	**19**	Y		Y			Y		Y	Y			Y																	Y																	
882	**21**	Y	Y	Y			Y		Y	Y																				Y	Y															Y	
882	**36**	Y		Y		Y	Y		Y	Y						Y														Y	Y																
882	**80**	Y					Y		Y	Y			Y			Y												Y																		Y	
882	**89**	Y				Y	Y		Y	Y			Y	Y	Y	Y												Y	Y																		
882	**91**	Y	Y				Y		Y	Y																		Y	Y																	Y	

Mitigation Table Alternative 4

Compartment	Stand	Wlin A4	VE1	VE2	VE3	VE4	VE5	VE6	S1	S2	S3	S4	S5	WA1	WA2	WA3	G1	H1	WL1	WL2	WL3	WL4	WL5	WL6	WL7	WL8	WL10	WL11	WL12	WL13	WM4	WM5	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	VS 1 buff	VS 2 land	VS 3 slash	VS 4 leaf off
309	3	Y					Y											Y																														
309	10	Y					Y			Y			Y			Y													Y																		
309	11	Y					Y																																								
310	10	Y					Y																																								
439	13	Y	Y	Y		Y	Y		Y					Y	Y	Y		Y											Y																		
439	41	Y	Y			Y	Y												Y										Y							Y					Y					Y	
440	19	Y					Y	Y	Y																				Y																		
440	40	Y	Y				Y	Y																					Y								Y									Y	
445	5	Y	Y	Y			Y		Y																		Y																		Y	Y	Y
445	9	Y					Y	Y																					Y																		
445	10	Y		Y			Y				Y																		Y																		
445	14	N																																													
445	16	Y					Y	Y	Y					Y	Y	Y													Y																		
484	5	Y	Y	Y			Y	Y			Y																Y																				
484	8	Y		Y			Y	Y			Y																Y																				
484	15	N																																													
484	29	Y		Y			Y	Y			Y																Y																				
484	30	Y					Y		Y		Y																Y																				
484	31	Y					Y	Y			Y										Y	Y					Y																				
484	32	Y		Y			Y	Y			Y																																				
484	33	Y					Y	Y			Y																		Y																		
484	43	Y		Y			Y				Y																Y																				
484	44	Y		Y			Y	Y			Y							Y									Y																				
484	45	Y					Y	Y													Y	Y							Y																		
484	46	Y	Y				Y	Y			Y										Y	Y							Y																		
484	48	Y					Y	Y																					Y																		
484	49	Y					Y																						Y																		
484	52	Y					Y				Y																Y																				
485	1	Y	Y				Y	Y	Y		Y																		Y																		
485	25	Y					Y		Y			Y																	Y																		
485	28	Y	Y				Y	Y													Y								Y																		
485	43	Y					Y	Y			Y																																				
492	19	Y					Y				Y																																				
492	20	Y	Y				Y				Y													Y					Y																		
493	9	Y	Y	Y			Y				Y																		Y																		
493	10	Y	Y			Y	Y				Y			Y	Y	Y		Y																														
639	2	Y					Y		Y																				Y																		
639	5	Y	Y	Y			Y		Y																				Y																		
639	7	Y					Y		Y		Y																		Y																		
639	10	Y	Y				Y																						Y																		
639	17	Y					Y		Y																				Y																		
639	64	Y					Y		Y																				Y																	Y	
639	67	Y					Y				Y																		Y																	Y	
641	26	Y					Y	Y	Y	Y																			Y																		
641	31	Y					Y		Y																																						
641	42	Y					Y	Y	Y							Y													Y																	Y	
641	44	Y	Y				Y																						Y							Y				Y						Y	
641	82	Y					Y	Y										Y									Y								Y												
641	86	Y					Y	Y						Y	Y	Y													Y							Y				Y						Y	
641	166	Y					Y		Y																				Y																	Y	
641	170	N																																													
642	1	Y	Y	Y	Y		Y				Y		Y			Y		Y											Y																	Y	
642	4	Y	Y		Y		Y		Y				Y			Y													Y																	Y	
642	6	Y					Y		Y																				Y																		
642	13	Y					Y		Y							Y	Y												Y																		
642	16	Y					Y		Y		Y		Y	Y	Y	Y													Y																		
642	17	Y					Y		Y				Y	Y	Y	Y													Y																		
642	18	Y					Y		Y		Y					Y													Y																	Y	
642	21	Y	Y				Y		Y																				Y																	Y	
642	23	Y					Y		Y																				Y																		
642	24	Y	Y			Y	Y		Y																				Y																	Y	
642	25	Y					Y		Y		Y		Y	Y	Y	Y													Y																		
642	27	Y				Y	Y		Y																		Y																				
642	29	Y	Y		Y		Y	Y	Y																				Y								Y									Y	
642	30	Y		Y		Y	Y		Y																				Y																		
651	19	Y					Y																						Y																		
651	25	Y					Y			Y			Y			Y													Y																		
651	30	Y					Y																				Y																				
651	78	Y					Y			Y			Y			Y													Y																	Y	
675	14	N																																													
675	16	Y					Y																						Y																		
675	20	Y					Y		Y																				Y																	Y	
675	21	N																																													
675	27	N																																													
675	41	Y					Y																						Y																	Y	
675	42	Y					Y		Y																				Y																	Y	
675	43	Y				Y	Y		Y				Y			Y													Y																	Y	

Mitigation Table Alternative 4

675	**44**	Y					Y																						Y																	Y	
675	**45**	Y					Y		Y							Y													Y																		
675	**50**	N																																													
675	**51**	N																																													
675	**53**	Y				Y	Y		Y					Y	Y	Y		Y											Y																		
675	**58**	Y					Y			Y			Y			Y													Y																		
675	**60**	Y	Y		Y		Y		Y	Y																	Y																		Y	Y	Y
675	**61**	N																																													
675	**64**	Y					Y		Y	Y	Y		Y			Y													Y																		
675	**66**	Y					Y		Y																				Y																	Y	
675	**67**	Y					Y		Y																				Y																		
675	**72**	N																																													
675	**78**	N																																													
675	**79**	N																																													
675	**87**	Y				Y	Y									Y													Y																		
675	**92**	Y					Y																						Y																		
675	**103**	N																																													
675	**104**	N																																													
675	**107**	Y					Y		Y																				Y																		
675	**110**	Y					Y																						Y																		
675	**112**	Y					Y		Y																				Y																		
684	**1**	N																																													
684	**11**	N																																													
684	**14**	N																																													
684	**18**	N																																													
684	**28**	N																																													
684	**29**	N																																													
684	**30**	N																																													
684	**31**	N																																													
684	**32**	N																																													
684	**35**	N																																													
684	**56**	Y	Y	Y		Y	Y		Y	Y	Y					Y	Y	Y									Y																	Y	Y	Y
684	**57**	N																																													
700	**2**	N																																													
700	**8**	Y	Y	Y			Y		Y	Y								Y											Y					Y			Y	Y	Y				Y		Y	Y	Y
700	**9**	N																																													
700	**13**	Y					Y										Y												Y																	Y	
700	**14**	N																																													
700	**16**	Y					Y																				Y						Y				Y									Y	
700	**18**	Y					Y		Y	Y																			Y				Y				Y									Y	
700	**21**	N																																													
700	**22**	N																																													
700	**25**	Y					Y		Y	Y						Y													Y				Y				Y										
700	**32**	N																																													
700	**34**	Y	Y	Y		Y	Y		Y	Y			Y			Y													Y				Y				Y										
700	**35**	Y	Y			Y	Y		Y							Y													Y				Y				Y										
700	**37**	N																																													
700	**38**	Y	Y				Y		Y	Y																			Y				Y				Y					Y			Y		
700	**40**	Y					Y																										Y				Y										
700	**44**	N																																													
700	**45**	N																																													
700	**51**	Y					Y									Y											Y						Y				Y								Y	
700	**56**	N																																													
700	**57**	Y					Y		Y								Y												Y				Y				Y										
700	**61**	Y				Y	Y				Y					Y													Y				Y				Y										
700	**63**	Y					Y		Y	Y																			Y				Y				Y										
700	**64**	Y				Y	Y		Y	Y				Y	Y	Y													Y				Y				Y										
700	**67**	N																																													
700	**70**	Y					Y																						Y				Y				Y								Y	
700	**71**	Y	Y	Y		Y	Y		Y							Y																Y			Y	Y					Y					
700	**77**	N																																													
700	**83**	N																																													
700	**85**	Y					Y		Y	Y						Y	Y												Y				Y				Y								Y	
700	**91**	N																																													
700	**96**	N																																													
700	**97**	Y	Y	Y			Y		Y	Y																			Y				Y				Y					Y			Y	
700	**98**	Y					Y																						Y				Y				Y								Y	
700	**99**	Y					Y		Y	Y						Y													Y				Y				Y								Y	
700	**102**	Y	Y	Y			Y		Y							Y											Y						Y				Y					Y			Y	
700	**103**	Y					Y		Y	Y				Y	Y	Y													Y				Y				Y									
700	**112**	N																																													
700	**113**	Y	Y			Y	Y		Y	Y						Y											Y						Y				Y					Y			Y	
700	**114**	N																																													
700	**115**	Y					Y		Y	Y						Y											Y						Y				Y										
700	**124**	N																																													
700	**125**	Y					Y		Y	Y						Y													Y				Y				Y								Y	
700	**129**	N																																													
700	**130**	Y		Y			Y										Y															Y				Y										
700	**131**	Y					Y									Y	Y												Y			Y			Y	Y								Y	
700	**132**	Y					Y		Y	Y						Y											Y						Y				Y								Y	
700	**134**	N																																													
700	**135**	Y					Y																				Y						Y		Y		Y								Y	
700	**138**	Y					Y			Y						Y											Y						Y				Y								Y	

Mitigation Table Alternative 4

700	**142**	N																																												
701	**2**	Y					Y		Y	Y						Y												Y																Y	
701	**12**	Y	Y				Y		Y	Y								Y										Y															Y	Y	Y
701	**13**	Y					Y		Y	Y						Y	Y										Y																	Y	
701	**16**	N																																												
701	**17**	N																																												
701	**22**	N																																												
701	**30**	N																																												
701	**31**	Y					Y		Y	Y																		Y																Y	
701	**35**	Y		Y		Y	Y		Y	Y						Y	Y										Y																		
701	**37**	Y	Y	Y			Y		Y									Y										Y															Y	Y	Y
701	**47**	Y					Y		Y	Y								Y										Y															Y	Y	Y
701	**54**	N																																												
701	**55**	Y	Y	Y			Y		Y	Y							Y				Y						Y																		
701	**59**	Y	Y	Y			Y		Y								Y											Y															Y	Y	Y
712	**3**	N																																												
712	**8**	Y	Y	Y		Y	Y		Y	Y						Y	Y						Y					Y																	
712	**11**	Y					Y																					Y																		
712	**12**	N																																												
712	**16**	N																																												
712	**17**	N																																												
712	**19**	Y					Y		Y	Y																	Y				Y	Y														
712	**20**	N																																												
712	**23**	N																																												
712	**25**	Y					Y										Y										Y																		
712	**28**	Y	Y	Y	Y	Y	Y									Y	Y	Y										Y																Y	
801	**6**	N																																												
801	**15**	Y					Y										Y										Y																		
801	**16**	N																																												
801	**17**	N																																												
801	**30**	N																																												
801	**31**	Y					Y																				Y								Y	Y				Y					Y	Y	Y
801	**32**	N																																												
801	**33**	Y					Y																				Y								Y	Y				Y					Y	Y	Y
801	**34**	Y					Y																					Y																		
801	**38**	Y					Y										Y										Y																		
801	**39**	Y					Y		Y								Y										Y																		
801	**40**	N																																												
801	**41**	N																																												
816	**1**	Y					Y				Y																	Y															Y	Y	Y
816	**2**	N																																												
816	**3**	Y					Y				Y																	Y																		
816	**5**	Y	Y				Y									Y												Y							Y	Y				Y		Y			Y	
816	**6**	Y					Y									Y												Y																		
816	**12**	Y					Y	Y		Y	Y		Y			Y												Y							Y										Y	
816	**14**	Y					Y																				Y																		
816	**18**	Y	Y			Y	Y		Y				Y			Y											Y								Y										Y	
816	**22**	Y	Y				Y																				Y								Y					Y		Y				
816	**24**	Y					Y									Y	Y										Y																	Y	
816	**26**	Y	Y			Y	Y							Y		Y											Y																	Y	
816	**29**	Y					Y							Y		Y											Y																		
816	**34**	Y	Y	Y			Y	Y									Y											Y																		
816	**44**	N																																												
816	**47**	Y					Y																				Y																		
816	**54**	Y					Y																				Y																		
816	**59**	Y					Y									Y												Y																		
816	**61**	Y					Y																					Y																		
816	**63**	Y					Y																				Y																		
816	**65**	Y					Y									Y	Y	Y										Y							Y					Y					Y	
816	**69**	Y				Y	Y									Y												Y																		
816	**70**	Y				Y	Y									Y											Y																		
816	**71**	Y					Y									Y											Y		Y																	
816	**72**	Y					Y									Y											Y																		
816	**74**	N																																												
816	**77**	N																																												
816	**82**	N																																												
816	**86**	Y					Y																					Y																		
816	**87**	Y	Y				Y																				Y																		
817	**4**	N																																												
817	**6**	Y					Y																				Y																		
817	**9**	N																																												
817	**12**	Y					Y			Y							Y	Y									Y																		
817	**13**	Y					Y		Y	Y		Y	Y			Y																													Y	
817	**15**	Y					Y									Y												Y																		
817	**16**	Y					Y									Y												Y																		
817	**18**	Y					Y				Y																	Y																		
817	**21**	Y					Y				Y					Y											Y																		
817	**25**	Y					Y									Y												Y							Y					Y					Y	
817	**26**	Y	Y			Y	Y		Y	Y			Y			Y																			Y	Y						Y			Y	
817	**27**	N																																												
817	**28**	Y					Y									Y												Y							Y					Y					Y	
817	**30**	N																																												
817	**31**	Y					Y				Y					Y	Y											Y																		

Mitigation Table Alternative 4

817	**32**	Y					Y										Y												Y																				
817	**33**	Y	Y	Y		Y	Y									Y	Y											Y																				
817	**39**	Y	Y				Y																					Y								Y					Y					Y		
817	**42**	Y					Y									Y													Y																			
817	**43**	Y					Y				Y																	Y																				
817	**45**	Y					Y									Y													Y						Y					Y					Y		
817	**48**	Y					Y		Y	Y			Y	Y		Y												Y						Y					Y					Y		
817	**49**	Y					Y																						Y					Y					Y					Y		
817	**50**	Y					Y									Y													Y																		
817	**51**	N																																														
817	**53**	Y	Y				Y																						Y					Y					Y		Y			Y		
818	**22**	Y					Y										Y												Y					Y					Y					Y		
818	**35**	Y					Y									Y	Y											Y																			
819	**1**	Y					Y									Y	Y												Y					Y					Y					Y		
819	**2**	Y					Y										Y												Y					Y					Y					Y		
819	**3**	N																																														
819	**4**	Y					Y																					Y																				
819	**6**	N																																														
819	**8**	Y				Y	Y		Y	Y		Y	Y			Y	Y																															
819	**9**	Y		Y			Y										Y												Y																			
819	**10**	Y					Y										Y												Y																			
819	**12**	Y		Y			Y										Y												Y																			
819	**13**	Y	Y	Y			Y						Y			Y	Y												Y																			
819	**17**	N																																														
819	**22**	Y	Y		Y		Y				Y						Y											Y																				
819	**23**	N																																														
819	**24**	Y					Y		Y					Y		Y	Y												Y																			
819	**25**	N																																														
819	**26**	N																																														
819	**28**	N																																														
819	**29**	N																																														
819	**30**	Y					Y									Y	Y												Y																			
819	**33**	Y					Y										Y											Y																				
819	**36**	Y					Y									Y	Y												Y																			
819	**37**	Y					Y										Y												Y																			
819	**38**	Y					Y									Y	Y												Y																			
819	**40**	N																																														
819	**41**	Y					Y									Y	Y											Y																				
819	**45**	N																																														
819	**47**	Y					Y							Y		Y	Y												Y																			
820	**49**	N																																														
821	**62**	Y	Y	Y			Y		Y	Y							Y											Y																				
821	**63**	Y					Y		Y	Y							Y											Y																				
821	**68**	Y					Y		Y	Y																		Y																				
821	**69**	Y					Y		Y									Y										Y																				
821	**71**	Y					Y		Y	Y	Y																	Y																				
821	**85**	Y					Y				Y							Y										Y																				
826	**2**	Y		Y	Y		Y				Y						Y											Y																				
826	**3**	N																																														
826	**6**	Y		Y			Y		Y	Y							Y											Y																				
826	**8**	N																																														
826	**9**	Y		Y		Y	Y		Y		Y					Y	Y												Y																			
826	**13**	Y					Y		Y	Y	Y		Y			Y	Y												Y																			
826	**18**	N																																														
826	**19**	Y				Y	Y		Y	Y	Y			Y	Y	Y												Y																				
826	**21**	Y					Y		Y	Y							Y												Y																				
826	**28**	N																																														
826	**31**	N																																														
826	**33**	Y					Y		Y	Y							Y											Y																				
826	**34**	Y					Y																																									
826	**44**	N																																														
826	**45**	Y					Y	Y	Y	Y	Y		Y			Y	Y												Y																			
826	**51**	Y		Y			Y				Y						Y											Y																				
826	**57**	Y					Y				Y																		Y																			
826	**59**	N																																														
826	**60**	Y					Y		Y	Y	Y						Y											Y																				
826	**62**	N																																														
826	**63**	N																																														
826	**64**	N																																														
826	**67**	N																																														
826	**68**	N																																														
826	**69**	N																																														
826	**70**	N																																														
826	**75**	N																																														
826	**76**	Y					Y		Y		Y						Y												Y																	Y		
826	**84**	Y					Y		Y	Y	Y																		Y																			
826	**85**	Y			Y		Y		Y		Y																		Y																			
826	**86**	Y			Y		Y		Y		Y							Y											Y																			
826	**88**	Y					Y		Y		Y																Y																				
826	**89**	Y					Y		Y		Y																		Y																			
826	**90**	Y		Y			Y	Y	Y	Y	Y						Y												Y																			
827	**2**	N																																														
827	**14**	Y	Y	Y		Y	Y		Y	Y	Y			Y	Y	Y													Y																			

Mitigation Table Alternative 4

827	**15**	N																																														
827	**16**	N																																														
827	**18**	N																																														
827	**24**	N																																														
827	**30**	N																																														
827	**33**	N																																														
827	**34**	N																																														
827	**40**	Y					Y		Y	Y				Y														Y																				
827	**41**	Y					Y		Y	Y	Y																			Y																	Y	
827	**51**	N																																														
827	**58**	N																																														
827	**59**	Y					Y		Y	Y	Y			Y	Y	Y														Y																		
827	**60**	Y					Y		Y	Y			Y			Y														Y																Y	Y	
827	**61**	Y					Y		Y							Y														Y																		
827	**65**	N																																														
827	**66**	Y	Y			Y	Y		Y	Y						Y	Y													Y																		
827	**67**	Y	Y			Y	Y		Y	Y						Y														Y																		
827	**68**	N																																														
827	**69**	Y		Y			Y		Y		Y						Y											Y																				
827	**71**	N																																														
828	**12**	N																																														
828	**15**	Y					Y		Y								Y																														
828	**17**	N																																														
828	**31**	Y	Y	Y		Y	Y		Y				Y			Y														Y																		
828	**33**	Y					Y		Y							Y	Y											Y																				
828	**52**	N																																														
828	**53**	Y	Y	Y			Y			Y	Y							Y										Y																				
829	**8**	N																																														
829	**9**	Y					Y		Y	Y																		Y																				
829	**10**	N																																														
829	**24**	Y					Y		Y	Y																		Y																				
830	**21**	Y	Y	Y			Y										Y													Y																Y	Y	Y
830	**22**	Y	Y				Y																							Y																Y	Y	Y
830	**29**	Y					Y				Y						Y													Y																	Y	
830	**43**	Y					Y		Y							Y														Y																		
830	**61**	Y					Y		Y																					Y																		
830	**62**	Y					Y																							Y																Y	Y	Y
830	**66**	Y	Y			Y	Y									Y														Y																		
830	**70**	Y	Y				Y																							Y																	Y	
831	**4**	Y					Y							Y		Y														Y																Y	Y	Y
831	**12**	Y	Y				Y																							Y																Y	Y	Y
831	**13**	Y					Y																							Y																		
831	**15**	Y					Y		Y	Y	Y					Y														Y																		
831	**30**	Y					Y		Y					Y		Y														Y																	Y	
831	**37**	Y					Y							Y		Y														Y																		
831	**40**	Y					Y																							Y																	Y	
831	**42**	Y					Y																							Y																		
831	**43**	Y					Y																							Y																		
831	**51**	Y					Y		Y					Y		Y														Y																		
833	**3**	Y	Y			Y	Y		Y							Y														Y													Y				Y	
833	**23**	Y					Y		Y	Y						Y														Y																	Y	
833	**35**	Y					Y									Y		Y										Y																				
833	**37**	Y					Y									Y														Y																		
833	**43**	Y					Y			Y	Y					Y														Y																		
833	**57**	Y	Y	Y			Y											Y												Y																	Y	
833	**70**	N																																														
833	**77**	Y	Y			Y	Y									Y														Y																		
833	**102**	Y					Y				Y					Y		Y												Y																		
833	**116**	Y					Y			Y	Y					Y														Y																		
833	**120**	Y					Y		Y							Y														Y																		
833	**122**	Y					Y			Y	Y					Y														Y																		
833	**132**	Y				Y	Y									Y														Y																		
834	**19**	Y					Y				Y			Y		Y	Y													Y																	Y	
835	**28**	Y	Y	Y	Y		Y				Y						Y													Y																	Y	
841	**23**	Y	Y	Y	Y	Y	Y				Y					Y	Y													Y																		
841	**25**	Y					Y						Y			Y	Y													Y																		
841	**33**	Y	Y	Y		Y	Y									Y	Y													Y						Y	Y			Y			Y			Y	Y
841	**35**	Y	Y	Y			Y									Y	Y													Y						Y	Y			Y			Y			Y	Y
841	**46**	Y	Y	Y			Y										Y													Y																	Y
841	**51**	Y	Y	Y			Y										Y													Y																		
841	**54**	Y	Y	Y	Y		Y				Y						Y													Y																		
841	**85**	Y		Y			Y				Y						Y													Y																		
842	**5**	Y	Y	Y		Y	Y									Y	Y													Y							Y						Y			Y	
842	**32**	Y	Y	Y			Y									Y	Y													Y																		
842	**74**	Y	Y	Y			Y									Y	Y													Y																		
844	**12**	Y					Y										Y													Y																		
844	**15**	Y					Y									Y														Y																		
844	**17**	Y					Y									Y	Y													Y																		
844	**29**	Y					Y				Y					Y												Y																				
844	**38**	Y					Y										Y													Y																		
844	**40**	Y					Y									Y	Y													Y																		
844	**42**	Y	Y	Y			Y										Y													Y																		
844	**60**	Y				Y	Y		Y							Y														Y																		

Mitigation Table Alternative 4

844	**64**	Y					Y										Y												Y																			
844	**75**	Y	Y	Y		Y	Y									Y	Y												Y																			
852	**39**	N																																														
853	**1**	Y					Y				Y						Y												Y																			
853	**2**	N																																														
853	**28**	N																																														
853	**34**	Y	Y	Y			Y		Y	Y																			Y																			
853	**40**	Y		Y			Y				Y									Y																												
853	**41**	Y					Y		Y		Y					Y	Y												Y														Y					
853	**43**	Y		Y			Y				Y						Y												Y																			
853	**44**	N																																														
853	**45**	Y					Y				Y									Y									Y														Y					
853	**46**	Y	Y	Y			Y				Y						Y			Y																								Y				
853	**47**	Y		Y		Y	Y		Y		Y						Y	Y																														
853	**52**	Y					Y			Y																																						
854	**8**	Y		Y			Y																						Y																			
854	**10**	N																																														
854	**13**	Y	Y	Y			Y	Y		Y	Y		Y																																			
854	**15**	Y		Y			Y	Y	Y	Y	Y																																					
854	**18**	Y	Y	Y			Y	Y	Y	Y	Y																		Y																			
854	**21**	Y					Y																						Y																			
854	**24**	Y	Y	Y			Y	Y		Y																																						
854	**26**	N																																														
854	**27**	Y	Y	Y			Y	Y		Y	Y																																					
854	**28**	Y					Y	Y	Y	Y																																						
854	**33**	Y					Y				Y																		Y																			
854	**35**	Y		Y			Y				Y						Y														Y	Y																
854	**37**	Y					Y			Y							Y												Y																			
854	**39**	Y		Y			Y	Y									Y																															
854	**40**	Y		Y			Y	Y																																								
854	**57**	Y		Y			Y	Y																					Y																			
854	**59**	Y	Y	Y			Y	Y		Y	Y						Y																															
854	**60**	Y					Y			Y							Y												Y																			
854	**62**	N																																														
865	**25**	Y					Y																						Y																			
865	**52**	Y					Y		Y		Y		Y			Y		Y											Y																	Y	
865	**67**	Y	Y	Y	Y	Y	Y		Y	Y			Y			Y													Y																	Y	
865	**77**	Y					Y		Y		Y					Y													Y																	Y	
866	**2**	Y		Y		Y	Y		Y		Y			Y	Y	Y	Y												Y																		
866	**6**	Y		Y		Y	Y							Y	Y	Y	Y																														
866	**12**	Y		Y		Y	Y	Y								Y	Y												Y																		
866	**31**	Y	Y	Y			Y		Y	Y	Y		Y				Y												Y																		Y
866	**44**	Y		Y		Y	Y		Y	Y						Y	Y												Y																		
866	**45**	Y		Y		Y	Y	Y			Y					Y	Y																														
868	**5**	Y	Y	Y			Y	Y		Y	Y						Y												Y																		
868	**13**	N																																														
868	**14**	Y	Y	Y			Y			Y	Y						Y																														
868	**16**	N																																														
868	**20**	Y		Y			Y										Y												Y																		
868	**27**	Y	Y			Y	Y	Y	Y				Y			Y																															
868	**28**	Y		Y		Y	Y	Y	Y	Y			Y			Y	Y																														
869	**1**	Y		Y		Y	Y				Y					Y	Y												Y																		
869	**5**	Y					Y				Y						Y	Y											Y																		
869	**8**	Y		Y			Y										Y												Y																		
869	**9**	N																																														
869	**11**	N																																														
869	**13**	Y		Y			Y		Y	Y	Y						Y												Y																		
869	**20**	Y		Y			Y			Y	Y						Y																														
869	**21**	Y	Y	Y			Y			Y							Y																														
869	**25**	Y					Y			Y	Y			Y	Y	Y	Y												Y																		
870	**4**	Y		Y		Y	Y	Y								Y	Y												Y																		
870	**8**	Y		Y		Y	Y	Y	Y		Y						Y												Y																		
870	**76**	Y				Y	Y	Y						Y	Y	Y																															
870	**80**	Y					Y		Y																				Y																		
871	**6**	Y		Y			Y		Y																				Y																		
871	**8**	Y					Y	Y	Y	Y																			Y																		
871	**12**	Y	Y		Y		Y	Y			Y							Y											Y																	Y	
871	**17**	Y	Y	Y			Y																						Y																		
871	**18**	Y					Y	Y	Y	Y	Y																		Y																		
871	**21**	N																																														
871	**45**	Y	Y	Y	Y		Y	Y																					Y																	Y	
871	**46**	Y	Y	Y	Y		Y	Y			Y							Y											Y																	Y	
871	**51**	Y					Y	Y	Y	Y	Y		Y																																		
871	**63**	Y	Y		Y		Y	Y	Y	Y	Y		Y																Y																	Y	
871	**65**	Y					Y		Y	Y																			Y																	Y	
871	**66**	Y		Y			Y	Y	Y	Y			Y																Y																		
871	**68**	Y		Y			Y	Y		Y																			Y																		
871	**88**	Y		Y		Y	Y		Y	Y			Y			Y													Y																		
871	**92**	Y	Y	Y	Y		Y	Y	Y	Y			Y			Y													Y																		
871	**96**	Y	Y	Y	Y		Y	Y	Y	Y			Y																Y																	Y	
871	**101**	Y		Y			Y	Y	Y	Y																			Y																		
871	**106**	Y	Y	Y			Y		Y	Y																																				Y	
872	**15**	Y					Y		Y		Y			Y	Y	Y													Y																		

Mitigation Table Alternative 4

872	**18**	Y					Y				Y			Y	Y	Y													Y																		
873	**3**	Y		Y	Y		Y		Y								Y												Y																		
873	**22**	Y					Y		Y								Y												Y																		
873	**24**	Y					Y		Y		Y						Y												Y																		
882	**10**	N																																													
882	**11**	N																																													
882	**12**	Y	Y		Y		Y		Y	Y																			Y																	Y	
882	**19**	Y		Y			Y		Y	Y			Y																Y																		
882	**21**	Y	Y	Y			Y		Y	Y																			Y																	Y	
882	**36**	Y		Y		Y	Y		Y	Y						Y													Y																		
882	**80**	N																																													
882	**89**	N																																													
882	**91**	N																																													

APPENDIX E

REGENERATION DEMONSTRATION AREA

KANE EXPERIMENTAL FOREST

A 36-acre tract of land on the northwest edge of the Kane Experimental Forest (referred to as training area B) has been used for the past 20+ years as an intermediate (thinning) area where participants in our week-long training sessions have marked thinning prescriptions based upon 100% inventories of the area. As these stands have aged, intermediate prescriptions no longer apply, and forest health problems have made this area unusable for its intended purpose. During the winter of 1995-96, a new marking area has been laid out and inventoried that will be used as a substitute for area B.

Training area B continues to have value as a training and demonstration area for our silviculture courses and marker training classes. The new training area will be marked to shelterwood prescriptions. Area B can be used to demonstrate regeneration practices after treatment. This was a criticism made by the Allegheny National Forest markers who took our one-day marking class the last two years. They mark to keep up with the sales quota, but seldom, if ever, get a chance to go back and observe their treatments after cutting. Using training Area B as a demonstration area will address this concern.

Area B has a variety of understory conditions. Some areas have good advanced regeneration that could be released by beech, and some areas have interference from fern. This lends itself to demonstrations of our various prescriptions to deal with a variety of understory conditions. In the past, we have had to spend up to 2 hours traveling to ANF sites to show classes regeneration prescriptions on the ground. Our course is designed to provide 1/3 classroom time explaining the principles of silviculture, 1/3 field time showing actual practices on the ground, and the remaining 1/3 actually doing the field exams and applying treatments on the ground.

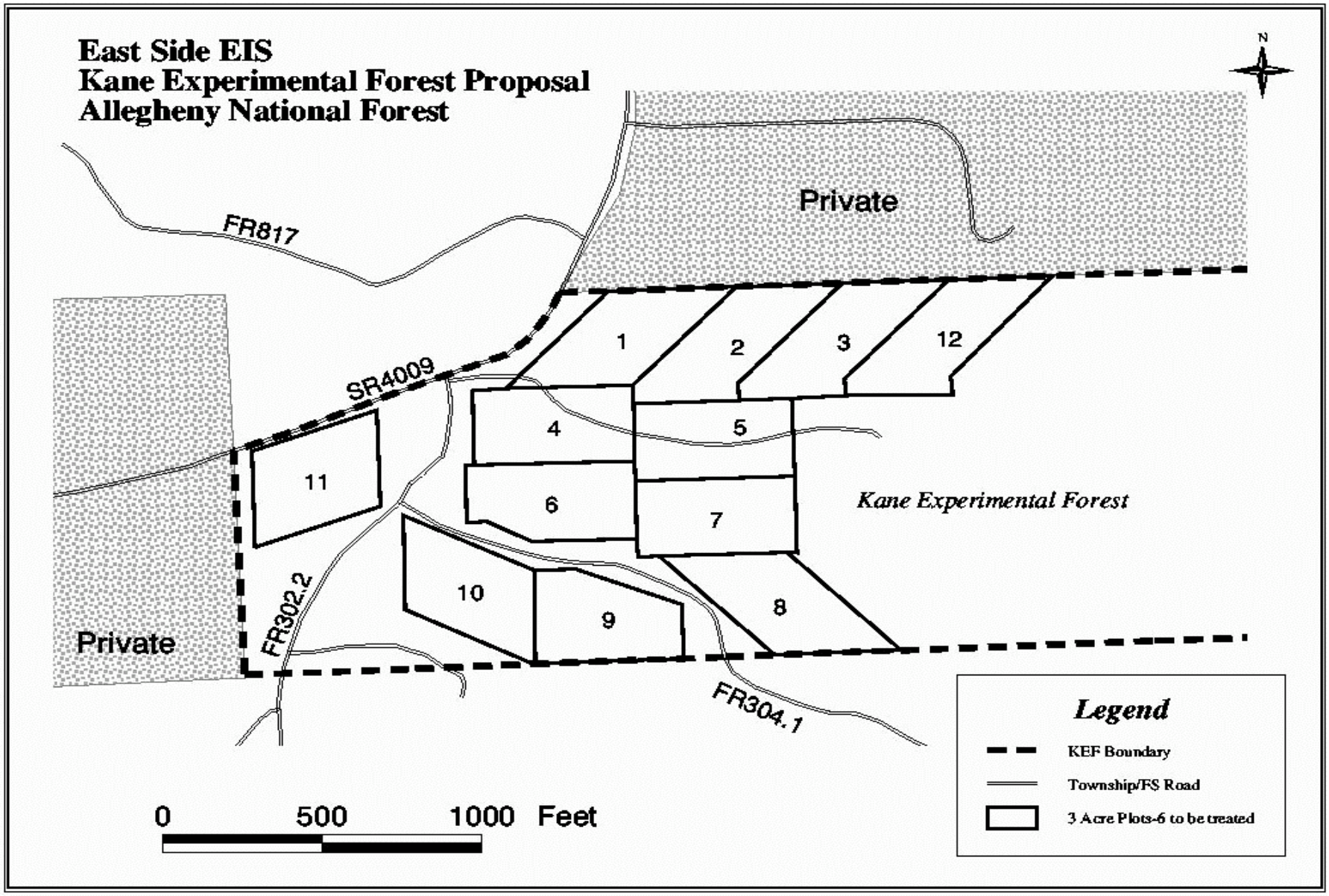
The following treatments will be made, their exact location on the ground to be determined based upon understory inventories made in June of 1996:

1. Shelterwood cut without low shade removal. (no herbicide).
2. Shelterwood cut with low shade removal of stems up to 20 ft. tall (using spray) 2a. Same as 2 with all saplings (all stems up to 5.5 inches dbh) removed.
3. Shelterwod cut with inadequate advanced regeneration.
4. Shelterwood with adequate regeneration.
5. Delayed shelterwood cuts with low shade removal.
6. Clearcut.
7. Uncut control.

Each treatment area will be 3 acres in size for a total of 18 acres. Herbicide use will be at most 6 acres and may not be used depending upon understory conditions as determined in the June inventory. In addition, a 20 ft. by 20 ft. fenced exclosure will be placed in each treatment to show deer impact. In this area we expect to see little difference inside and outside the fence due to low deer impact as a result of the extensive cutting which has taken place in the adjacent 6.2 area, the proximity to agricultural land, and proximity to paved road, and railroad.

We would hope to have these treatments in place during the 1996 growing season and begin using them as demonstration after one or two growing seasons. With over 20 years of records on these stands and the ability to save 2 hours of precious time for our training sessions this area will be of great value to the lab and to those whom we transfer the latest technology to.

The enclosed map outlines the current areas which are 3 acres in size (the numbered areas) and how they are subdivided into 1 acre subplots. The actual treatment areas will be within these boundaries, but the final configuration may be different due to understory differences. For example, if the understory in 2A is more like the understory of 5A & B, it would be combined with them to makeup the 3 acre treatment area.


East Side EIS
Kane Experimental Forest Proposal
Allegheny National Forest
N
Private
FR817
SR4009
1
2
3
12
4
5
11
6
7
Kane Experimental Forest
10
9
8
FR302.2
Private
FR304.1
0
500
1000
Feet
Legend
KEF Boundary
Township/FS Road
3 Acre Plots-6 to be treated

APPENDIX F

ALLEGHENY NATIONAL FOREST

FOREST PLAN ANALYSIS SUMMARY AND UNEVEN-AGED MANAGEMENT CONSIDERATIONS FOR PROJECT ANALYSES FROM FOREST PLAN IMPLEMENTATION AND MONITORING

MANAGEMENT AREAS 1, 2, 3, AND 6.2

April 16, 1998

Prepared by: Robert White, Forest Silviculturist
Lois DeMarco, Forester/Analyst

ALLEGHENY NATIONAL FOREST

FOREST PLAN ANALYSIS SUMMARY AND UNEVEN-AGED MANAGEMENT CONSIDERATIONS FOR PROJECT ANALYSES FROM FOREST PLAN IMPLEMENTATION AND MONITORING

MANAGEMENT AREAS 1, 2, 3, AND 6.2

A. INTRODUCTION

This document provides a summary of the consideration given in the Forest Plan analysis to the use of uneven-aged management (UEAM) versus even-aged management (EAM) on the Allegheny National Forest (ANF). It also briefly mentions Forest Plan direction for using both silvicultural systems in Management Areas (MA) 1, 2, 3, and 6.2, which constitute the majority of the area on the ANF where timber harvesting occurs. Finally, it summarizes what we have learned about reforestation success for each silvicultural system as we have implemented the Forest Plan and presents some conclusions for consideration by decisionmakers when selecting the preferred alternative for specific projects.

B. FOREST PLAN ANALYSIS

Forest Plan Took a Detailed Look at Local Uneven-aged Management Versus Even-aged Management Tradeoffs

Specific planning issues regarding EAM versus UEAM (Forest Plan FEIS, Ch. 1, pp. 8, 11 to 13; pp. A-20 and 21, pp. C-44, 45, 47, 52).

Analysis considered even-aged and uneven-aged management as options on all acres except where use was restricted by law (Forest Plan FEIS, Appendix B, pp. 9, 51, and 63)

Site-specific vegetation & landform data was used in analysis (Forest Plan FEIS, Appendix B, pp. 6 to 16, 20 to 37, and 69 to 112)

Even-aged and uneven-aged prescriptions were developed to similar level of detail (Forest Plan FEIS, Appendix B, pp. 42 to 75) and contained local values for ANF conditions (Forest Plan FEIS, Appendix B, pp. 17 to 75).

Extensive analysis shows major differences develop from selecting EAM vs. UEAM -

- EAM and UEAM favor different tree species (Forest Plan FEIS, Ch. 4, pp. 21 to 23, 26 and 29) with different values and benefits (Forest Plan, Appendix D, pp. 12 and 13).
- EAM and UEAM produce different forest structure (Forest Plan FEIS, Ch. 4, pp. 21 and 29).
- Must harvest more acres with UEAM to get total harvest volume similar to EAM (contrast Alternatives D and E) (Forest Plan FEIS, Ch. 2, pp. 61 and 76; ROD, pp. 15 and 16).
- More herbicide treatment with UEAM to get similar harvest volume (Forest Plan, FEIS, Ch. 4, p. 38; Appendix B, pp. 225 and 226; ROD, p. 17).
- Each favor a different mix of wildlife species (Forest Plan FEIS, Ch. 4, pp. 22, 23 and 29; ROD, pp. 18 and 22 to 23).

- Deer browsing more pronounced on slow-growing species favored in UEAM (Forest Plan FEIS, Ch. 4, p. 27; Forest Plan, Appendix D, p. 9).

EAM is much more cost efficient than UEAM (Forest Plan FEIS, Appendix B, pp. 27 to 30) meaning much less concern about below cost timber sales (Forest Plan FEIS, Appendix C, p. 52; ROD, p. 15).

Benchmark analysis (defined in Forest Plan FEIS, Appendix B, p. 123) to determine maximum responses to problems included zero to 82,700 acres of UEAM (see prescription 2/2.21 acres) (Forest Plan FEIS, Appendix B, pg 158 & 160).

Wide Range of UEAM Alternatives Considered in the Forest Plan FEIS

Forest Plan FEIS evaluated five alternatives (alternative defined in Forest Plan, FEIS, Appendix B, pp. 163 to 165), each a unique mix of management prescriptions assigned to specific land areas to achieve desired goals and objectives (Forest Plan FEIS, Chapter 2, pp. 2-26 to 2-45). Specific references to UEAM can be found:

- UEAM emphasized in Alternatives A and E to produce land/vegetation conditions which meet each alternative's objectives (Forest Plan FEIS, Appendix B, p. 175, 3(a) and (b), pp. 211-212, 3(a) and (b); Forest Plan FEIS. pp. 2-26, 2-43, 2-44).
- Wide variation in amount of UEAM (called MA 2 on Table 2-10) between Alternatives [6,000 acres in Alternative D, the preferred alternative, and 175,000 acres in Alternative E (Forest Plan FEIS, Ch. 2, p. 47].
- Description of land condition for each alternative (Forest Plan FEIS, Ch. 2, p. 2-46).
- Land assignment to Management Areas for each alternative & description of desired land condition (including reference to harvest method for each Management Area) (Forest Plan FEIS, Ch. 2, Table 10, p. 2-47).
- Forest Plan EIS Management Area Maps show specific sites on the ANF where UEAM (MA 2) was considered (see Forest Plan maps for Alternatives A, D, and E).

Forest Plan FEIS Environmental Consequences by Alternative

Environmental Consequences of the practice of even-aged management (EAM) are discussed in Forest Plan FEIS, Chapter 4, pp. 4-17 to 4-24.

Environmental Consequences of the practice of uneven-aged management (UEAM) are discussed in Forest Plan FEIS, Chapter 4, pp. 4-24 to 4-30.

Treatments and outputs by alternative:

- Acres of vegetation treatment (Forest Plan, FEIS, Chapter 2, Table 2-12, p. 2-61).
- Timber volume (Forest Plan, FEIS, Chapter 4, Table 4-8, p. 4-16).
- Dispersed recreation (Forest Plan, FEIS, Chapter 4, Table 2-11, p. 2-56). (Differences are due to varying amounts of UEAM vs EAM).

Cumulative effects are unique for each alternative (Forest Plan, FEIS, Chapter 4, p. 61). Implied in this discussion is the understanding that uniqueness is a direct result of the amount of EAM vs UEAM in an alternative.

- Brief discussion (Forest Plan, ROD, p. 31).
- Table Display (Forest Plan, ROD, p. 31).

Specific references to UEAM in cumulative effects are found:

- visuals (Forest Plan FEIS, Ch. 4, pp. 4-73, 76, 77)
- roads (Forest Plan FEIS, Ch. 4, pp. 4-86, 87)
- vegetation (Forest Plan FEIS, Ch. 4, pp. 4-95 and 97)
- wildlife discussion (Forest Plan FEIS, Ch. 4, pp. 4-101, 102, 105 and 106) does not spell out UEAM; however, the condition of vegetation is a direct result of using either EAM or UEAM.

C. REGIONAL FORESTER'S CONSIDERATIONS WHEN SELECTING FOREST PLAN PREFERRED ALTERNATIVE

Decision Criteria. Many factors, including information on benefits, costs, public issues, comments on the Draft EIS, environmental effects, and responsiveness to public isues and comments were considered in making the decision that Alternative D comes nearest to providing maximum net public benefits in an environmentally sound manner (ROD, p. 6).

Effect of the decision on future project analysis. The decision to approve Alternative D narrows the scope of future environmental analyses to be performed for actions arising from the Forest Plan. Future environmental analyses will tier to the Plan's direction and the Final EIS. (ROD, p. 6).

Implementation is guided by the management area direction (MA 2, MA 3, MA 6.2) found in Chapter 4 of the Plan (Forest Plan, ROD, p. 38).

Rationale for choosing Alternative D. It is responsive to the six management problems, and it complies with 36 CFR 219.1 (a) "...The resulting plan(s) shall provide for a multiple use and sustained yield of goods and services from the National Forest System in a way that maximizes long term net public benefits in an environmentally sound manner" (ROD, p. 5). The rationale for selecting Alternative D is presented on pages 6 through 25 of the ROD.

Problem 2 - Providing Dispersed Recreation Opportunities. It offers the appropriate mix of recreation opportunities. It provides the most semi-primitive, non-motorized recreation opportunities, while still offering moderate amounts of semi-primitive motorized and roaded natural settings. (ROD, p. 11)

Problem 3 - Timber Management. Forest Plan provides the most balanced timber program, considering demands for other resource uses (ROD, p. 14)

Timber Volume. Forest Plan responds to industry and consumer demands for increased production of high quality sawtimber. This means better utilization of existing mill capacities and additional employment opportunities. (ROD, p. 14)

Though Alternative C provides the highest timber benefits, Alternative D was preferred because of the higher level it provides of wildlife habitat improvement work, the mix of recreation opportunities, and the level of trail construction. Alternative D was selected over Alternative E (which had much more uneven-aged management) because it has a stronger emphasis on quality sawtimber production.(ROD, p. 14)

With Alternative D, below cost timber sales will remain uncommon on the ANF. (ROD, p. 15)

Vegetation Treatments. Some people supported more even-aged management, others supported more uneven-aged management. Many expressed concern over the safety of herbicides. (ROD, p. 15)

Final Harvest. Final harvest (even-aged management) in Alternative D is at the middle of the range established by the other alternatives. The Forest Plan level of harvest emphasizes habitat for wildlife species requiring early successional stages of vegetation, maintaining high-value shade intolerant trees on good sites, and assuring visual variety in the Forest landscape. (ROD, pp. 15 - 16) Even-aged silviculture will dominate (Forest Plan, ROD, p. 4).

Herbicide Use. Research and detailed, local analysis (ANF Understory Vegetation Management FEIS, March 1991) have shown that selected herbicides can be applied safely to the environment. Given current technology, herbicides are the most effective technique which can be used to control unwanted understory vegetation. (ROD, p. 16)

Alternative D calls for 2,000 acres of herbicide treatment per year in Decade 1, much lower than the Alternatives which include large amounts of uneven-aged management (Alternative A projects 31,000 acres of herbicide treatment and Alternative E projects 48,000 acres). (ROD, p. 17)

Problem 4 - Wildlife Habitat.

Big-Game Populations. Alternative D would produce the highest big-game (deer, turkey, and bear) habitat capability levels of all alternatives considered. This translates into higher big-game population levels and better hunter success. It recognizes the importance people place on these, while striving to bring these in line with habitat carrying capacity. (ROD, pp. 18 and 19)

Wildlife Habitat. The vegetative conditions created under the Forest Plan offer a balanced wildlife program. Each indicator species would be managed to at least minimum viable population levels, and the levels of many wildlife species would be increased. Horizontal diversity is maximized, and the array of habitat types is balanced (ROD, p. 24).

The Forest Plan favors those species associated with: (1) regenerating deciduous habitat, (2) regenerating hemlock habitat, and (3) old growth mixed hemlock-deciduous habitat. It leads to reduced population levels for those species requiring mature deciduous habitat type. This mix of habitat types is appropriate and will support other Forest Plan objectives associated with visual quality and recreation opportunities. (ROD, p. 24)

Potential for Controversy. "Although controversy will continue, we believe that adequate response has been made to the public issues by the range of alternatives considered..... The views of one side versus another are adequately reflected in the alternatives. The Forest Plan provides a wide range of environmental conditions and choices for goods, services and uses." (ROD, p. 26)

The controversy over the use of even-aged silviculture will continue. Based upon the acreages involved, controversy would be highest in Alternative C and lowest in Alternatives A and E. (ROD, p. 26)

The controversy over high deer populations and their effects on timber regeneration will continue. The combination of more cutting, improved habitat conditions, and lower population level targets (of the Pennsylvania Game Commission), will slowly reduce the problem and lead to a healthier deer population. (ROD, p. 26)

Economic Considerations. Present net value, net receipts, total costs, total receipts, non-cash benefits, payments to counties, and returns to the U.S. Treasury were evaluated when selecting

Alternative D. Alternative D provided the optimal balance between these and other considerations. (ROD, p. 30)

Identification of the Environmentally Preferable Alternative. Based upon the summary of management practices and estimated long-term cumulative effects (ROD, p. 31), Alternative A (which contains a large amount of uneven-aged management) would create the least disturbance to the environment. It is the environmentally preferable alternative. (ROD, p. 32)

Given this fact, however, the Forest Plan is still the best choice. Forest Plan Standards and guidelines are designed to mitigate the potential for severe environmental damage. In addition, we believe Alternative D provides the most desirable level of goods, services, and uses to the public. (ROD, p. 32)

D. FOREST PLAN DIRECTION

Descriptions of alternative future land conditions, called Management Areas, were developed (FEIS Appendix B, pp. 39 to 42) to satisfy the competing needs identified by the planning problems. Management activities on the ground within each Management Area include a common set of management practices designed to achieve the unique land condition, goals, and objectives of that Management Area (ROD, p. 5). For example, harvest practices must achieve the desired vegetation conditions established for each area. The primary silvicultural method (either even-aged or uneven-aged management) plays a key role. As with zoning ordinances, certain activities are permitted within each zone or Management Area shown on the Forest Plan map (ROD, pp. 4-54 to 4-59). No decision was made in the Forest Plan as to when activity would ocur on a specific site (ROD, p. 40).

Management Area 1

This management area provides a forest of primarily hardwood stands, with interspersed conifers and openings suitable for a variety of game and non-game wildlife species associated with early successional stages of vegetation. Even-aged timber stands in a balanced variety of age and size classes, from seedling/sapling to small sawtimber, will be evident. (Forest Plan, Ch. 4, p. 60)

Even-aged management will be the featured silvicultural system used to achieve the wildlife habitat objective. (Forest Plan, Ch. 4, pp. 12 and 64)
Uneven-aged management may be an option on inclusions, such as riparian areas, wet soils, or visually sensitive areas. Its use will be based on individual site analysis. (Forest Plan, Ch. 4, p. 64)

Management Area 2

The Forest will consist primarily of uneven-aged Northern hardwood stands containing trees of a variety of ages and size classes. Species composition will be varied, but shade tolerant species will be dominant. Featured wildlife species are those associated with shade tolerant vegetation, primarily songbirds and cavity-nesting birds and mammals. (Forest Plan, Ch. 4, p. 70)

Uneven-aged management will be the featured silvicultural system, with an emphasis on producing quality sawtimber consisting of primarily shade tolerant species (Forest Plan, Ch. 4, pp. 12, 70, 75).

Even-aged management may be an option on inclusions such as aspen stands for wildlife and within visual corridors for providing variety and viewpoints (Forest Plan, Ch. 4, p. 76).

Management Areas 3 and 6.2

Activities within these areas are designed to achieve a forest which is a mosaic of predominantly hardwood stands and associated understory vegetation. Each stand consists of trees of the same age, with Allegheny hardwoods and oak as the dominant species. (Forest Plan, Ch. 4, pp. 11, 12, 82, 83, 125, and 126; FEIS, Appendix B, pp. 53 and 54)

Even-aged management will be the primary harvest technique, with management emphasizing production of high value, high quality, Allegheny hardwoods and oaks. (Forest Plan, Ch. 4, pp. 82 and 125)

Uneven-aged management may be an option on inclusions, such as riparian areas, wet soils, or visually sensitive areas. Its use will be based on individual site analysis (Forest Plan, Ch 4, pp. 87 and 131). Table 4-13 (Forest Plan, p. 4-84) and Table 4-19 (p. 4-127) reflect no UEAM acreage estimates since it was expected to be a minor part of total harvest activity.

Rationale for Selecting Silvicultural System

Timber harvests are designed to achieve a number of resource management objectives, including developing desired visual conditions, species composition, wildlife habitat, timber product mix, and revenues (Forest Plan, Appendix D, p. 1).

E. FOREST PLAN IMPLEMENTATION

Definition. Implementation is the process used to achieve, on the ground, the desired future conditions and management direction described in the Forest Plan for each management area. (FEIS, Appendix B, p. 2; ROD, pp. 37, 38; Forest Plan, Ch. 5, p. 1)

To achieve the desired future condition, ANF personnel must implement the kinds and intensities of activities described in the Management Area direction, including the standards and guidelines. Significant variation from these (such as conducting large amounts of uneven-aged treatments in Management Area 3 where the objective is to have an even-aged forest) would result in achieving a different future condition, goods and services, long-term yields, or a significantly different cost efficiency. (ROD, pp. 38-39, 3-6)

Project Identification and Analysis. The Forest Plan is implemented through projects identified at specific sites (ROD, p. 38). During the project analysis, the condition of each stand is reviewed. Within the boundaries of the Forest Plan direction and the capability of each site, stand management options are considered which would contribute to helping the project area achieve the desired future condition and produce the projected goods and services. (ROD, pp. 5 and 38)

F. WHAT HAVE WE LEARNED DURING FOREST PLAN IMPLEMENTATION

Legal Requirement for Monitoring and Evaluation

Evaluate implementation on a sample basis to determine how well objectives have been met and how closely management standards have been applied (36 CFR 219.12).

Monitoring shall include a quantitative estimate of performance [36 CFR 219.12(k)(1)] and a determination of whether prescriptions are being implemented within the management areas assigned and as specified in the Forest Plan management direction [36 CFR 219.12(k)(2)].

In regeneration harvest areas, assure adequate tree seedlings develop within five years [36 CFR 219.12 (k)(5) and 36 CFR 219.27(c)(3)].

Summary of Results

Several species (beech, sugar maple) key to UEAM face serious insect, disease, & decline problems (ANF FY 1996 Monitoring and Evaluation Report, pp. 26 to 30).

Monitoring and evaluation show that site selection and marking to achieve structural objectives for UEAM has improved over time (ANF FY 1996 Monitoring and Evaluation Report, p. 77).

Marginal seedling development is occurring in stands treated with UEAM (ANF FY 1996 Monitoring and Evaluation Report, pp. 16, 17, 76, 77, Appendix A).

Adequate seedling development is occurring in stands treated with EAM (ANF FY 1996 Monitoring and Evaluation Report, pp. 16 and 17).

Until better regeneration results can be assured, we need to limit the application of UEAM (ANF FY 1996 Monitoring and Evaluation Report, p. 77).

Regeneration requirements for tree seedling species needed to successfully maintain uneven-aged stands over the long term are not well understood. Adaptive management and administrative studies are underway to gain a better local understanding. These kinds of studies can take an extended period of time, so results may not come quickly.

Forest Health Concerns. Local forest health concerns, which are now better understood than when the Forest Plan was prepared, raise substantial questions about the long-term feasibility of uneven-aged management on the Allegheny Plateau. Beech bark disease complex is now present on most of the ANF, and sugar maple decline and mortality is abundant on about 100,000 acres. (ANF Monitoring and Evaluation Report, pp. 26 to 30)

Harvest Values. Black cherry and red oak (both featured in even-aged management) have retained their high economic value relative to other species. For example in a September 1994 timber sale, black cherry sold for a record $2,110 per thousand board feet. The 88 acres in the timber sale averaged $16,300 per acre for a total value of close to $1.5 million. The record high for black cherry of $2,276 per thousand board feet occurred in December 1994. Recently cherry stumpage values have ranged from $1,500 to $1,700 per thousand board feet. These high values further increase the economic efficiency disparity demonstrated in the Forest Plan timber financial analysis (Forest Plan, Appendix B, pp. 27 to 30, and the planning records) between even-aged and uneven-aged management.

G. EVALUATION AND CONCLUSIONS.

NEPA and its implementing regulations direct the Forest Service to consider a "broad range of reasonable alternatives" during project design and analysis. Given the following considerations described in detail in previous sections of this summary, it seems prudent and reasonable to limit uneven-aged management primarily to the kinds of sites specified in the Forest Plan Management Area direction:

- knowledge gained between 1986 and 1996 regarding the marginal reforestation success expected following uneven-aged treatments,
- legal requirement to assure reforestation within five years of the UEAM regeneration harvest (36 CFR 219.27(c)(3),
- the current 94% reforestation success rate for even-aged harvests,

- the much lower cost efficiency of UEAM,
- much lower production of high quality sawtimber with UEAM to meet public demand,
- trade-offs in the kind of wildlife habitat provided,
- the long-term need for much more herbicide use with UEAM,
- the forest health concerns, particularly regarding beech bark disease complex and sugar maple decline/mortality, for tree species featured through UEAM,
- the detailed uneven-aged analysis inherent in the Forest Plan,
- trade-offs the decisionmaker considered when selecting Forest Plan Alternative D, and
- the Forest Plan direction for each management area and for implemention.

EAST SIDE PROJECT

APPENDIX - G

FOREST SERVICE RESPONSE TO 45-DAY COMMENTS

East Side Project Appendix - G

Forest Service Response to 45-Day Comments

Federal agencies with jurisdiction by law or expertise and the public were invited to comment on the East Side Draft Environmental Impact Statement. Comments on an environmental impact statement or on a proposed action shall be as specific as possible and may address either the adequacy of the statement or the merits of the alternatives discussed or both. (40CFR1503.3(a)).

This appendix displays the public and governmental agency comments received during the East Side Draft Environmental Impact Statement 45-day comment period. Each letter is divided into individual comments by letter followed by the Forest Service response. One hundred forty-three (143) letters (including e-mail, form letters, and letters with multiple signatories) were received from individuals, organizations, or governmental agencies. No new information was received that either brought forward new issues or would cause a change in the analysis for the East Side FEIS. As a result of some comments, there were, in addition to editorial changes, minor changes made in the East Side FEIS and in Appendices B, C, and D. These changes are noted in the Forest Service response to comments

Possible responses to comments are to (40CFR1503.3(a)):

1) Modify alternatives including the proposed action.
2) Develop and evaluate alternatives not previously given serious consideration by the agency.
3) Make factual corrections.
4) Explain why the comments do not warrant further agency response, citing sources, authorities, or reasons which support the agency's position and, if appropriate, indicate those circumstances which would trigger agency reappraisal or further response.

Comments were analyzed for site specificity to the East Side project. Some comments were judged to be "beyond the scope of the project", because they addressed broader issues than the implementation of activities proposed in the East Side documents. For example, 'I don't like logging on the National Forests (a national-level issue)' or 'I don't want logging on the Allegheny National Forest (a national/Forest-level issue)'. A comment such as "I don't think you should cut unit A19 because there is critical habitat there" would be an example of a comment site-specific to the East Side project. Some comments were opinions and not specific comments about the proposed activities or the adequacy of the document, 'I do (don't) support road building.' Some "comments" were not comments at all, but simply quotations. As noted in the comment responses, most responses point to where the comment was addressed in the document, some required a correction to the document, and some were beyond the scope of the East Side project.

Although there were 143 comment letters received during the 45-day comment period there were many comments that were the same or similar within the same letter or between letters. Therefore, we have responded to the body of the comments in their entirety. The first time a comment is encountered a response is provided. The Forest Service response follows each comment and is in bold type. For example:

Letter #3

Comment #2

We shouldn't be logging on National Forest land

This is a national issue and beyond the scope of the site-specific East Side project.

Letter #5

Comment #7

You need to provide an alternative that returns the project area to pre-clearcut conditions.

See Chapter II – Alternatives, Alternatives Considered But Eliminated From Detailed Study.

In order to eliminate redundancy and reduce paperwork, the next time the same or similar comment is encountered the previous response is referenced. For example:

Letter #20

Comment #18

All logging on National Forests should be stopped and the land should be ecologically restored to presettlement conditions.

See comment # 3 letter # 2 and comment #7 letter #5 above.

Numerous E-mails, letters, and petitions were received after the close o f the 45 day comment period. Since they were not received in a timely manner, they are not included in this appendix and have been placed in the Project File. They were reviewed and no new information was presented that was not already included in the 143 comments that were received during the comment period.

Comments Received During the 45-Day Comment Period for the East Side Draft EIS and Forest Service Responses

Letter #1 – Paul Riley 5
Letter #2 – Jeff Volk 6
Letter #s3-5, 30 – (These were submitted as postcards and were all the same).....7
#3 - Kathryn Koncsal 7
#4 - Kate Rindilo.....7
#5 - Ginette Walker.....7
#30 - Frances Haskins.....7
Letter #s7, 6, 11, 136, 137 -.....7
#7 - Charles Aston 7
#6 - Eric Noyes 7
#11 - Jessica Murray 7
#136 - Stephanie Helsel 7
#137 - T. Alexander Denmarsh.....7
Letter #8 – John Kesslick 9
Letter #9 –Devin M Scherűbel, Heartwood 24
Letter #10 – Brian Topping 43
Letter #12-#14 43
#12 - Andrew Gianni.....43
#13 – Matt Caesar.....43
#14 – Peter Larson 43
Letter #s15-21, 23, 40, 42, , 44-46, 48-64, 71-73, 75, 81-86, 88-94, 96-97, 99-100, 105-119, 122-126 43
#15 - Jim Kleissler 43
#16 - Danielle Redden 43
#17 - Janice DeCarolis.....43
#18 - Jean DeSabato 43
#19 - Christine DeCarolis 43
#20 - Carol Sinatra.....43
#21 - Thomas Bachelder 43
#23 - Jeanne Freyer.....43
#40 - Holly Haworth 43
#42 - Michael Kruse.....43
#44 - Josh Knauer 43
#45 - Barbara Warner 43
#46 - Michael Kukla 43
#48 - Elisa Bondar 43
#49 - Victoria Lehman 43
#50 - Joyce Tseng 43
#51 - Maurina Roberts 43
#52 - Erin Jones 43
#53 - Lori Porcelli.....43
#54 - Martha Wicklehaus.....43
#55 - Kevin Balaz 43
#56 - Linda/Sam Caputo 43
#57 - Kathleen Orion 43
#58 - Karyn Kaplan.....43
#59 - Lori Hammer 43
#60 - Newkirk Johnson 43
#61 - Chris Sullivan 43
#62 - Peter Zawadzkas.....43
#63 - Dev Hathaway 43
#64 - Charles Aston 43
#71 - Paul Brown 43
#72 - Mary Havrilla 43
#73 - Ray Schlee 43
#75 - Mark Donham/Kristi Hanson.....43
#81 - Gwyndolyn Griffin.....43
#82 - Sue Whayne.....43
#83 - Marie Hathaway.....43
#84 - Shannon Hughs.....43
#85 - Brenda McMahon.....43
#86 - Joseph Rhodes 43
#88 - Jerry Martello 43
#89 – Beverly Braverman 43
#90 - Josiah Groff 43
#91 - Alfred Seiss.....43
#92 - William Belitkus.....43
#93 - Diane Donham.....43

#94 - Patricia Kinsman.....43
#96 - Fritz Paltzke.....43
#97 - Gale Cook.....43
#99 - Hillary Aisenstin.....43
#100 - Eric Gallo 43
#105 – Larry Zalewski 43
#106 - Christy Wojculewski.....43
#107 - Ray Fenner.....43
#108 - Joseph Cassacio 43
#109 - Carla/Paul Yamvert 43
#110 - Brian King 43
#111 - Tom Bik.....43
#112 - Erik Lazdins.....43
#113 - Marty Berghoffen 43
#114 - Apryle Carney.....43
#115 - KP.....43
#116 - Corrie Bosman.....43
#117 - Karnan Devlin.....43
#118 - Steve DiPietro.....43
#119 - Group Against Smog and Pollution 43
#122 - Marty Light.....43
#126 - Dan Rain.....43
#127 - Meg Ferrigno 43
#128 - Gary Kolb 43
#129 - Nubia Perez 43
Letter #22 - John Mitchell.....46
Letter #24 – Ed MacAuley 46
Letter #25 – Chris Schimmoeller.....46
Letter #26 – Daniel Cross.....47
Letters #27, 32 – Cynthia Wutchiett; Wutchiett & Associates 47
Letter #28 – Thomas Bachelder.....48
Letter #29 – Charles Aston 48
Letter #31 - William Menke, USDI, National Park Service 49
Letter #33 – Robert Meuller 50
Letter #34 – Sherman Bamford.....50
Letter # 35 – Robert Vavrilla.....51
Letter #36 –Megan Rancier 51
Letter #37 –Mark Freed.....51
Letter #38 – Brooke Nuckles.....51
Letter #39 –Anne Kretschmann 51
Letter #41 – Melissa Roberts 52
Letter #43 - Frank Eckel 52
Letter #47 – Susan Curry.....53
Letter #65 – Jim Kleissler, Allegheny Defense Project.....53
Letter #66 - Adam Rissien.....53
Letter #67 - Larry Hutchins.....53
Letter #68 –Donald Dukelow 54
Letter #69 –Thomas Kase 54
Letter #70 – Henry Hild 56
Letter #74 – Doug Cornet 56
Letter #76 – Douglas Carlson, Forest County Conservation & Planning Department, Executive Director 56
Letter #77 – Casey Brown..... 59
Letter #78 – Jack Hedlund, Allegheny Forest Alliance, Executive Director 59
Letter #79 – Helen Johns-Richardson 60
Letter #80 - Barbara Warner 61
Letter #87 - Dr. John Hoson 61
Letter #95 – David Nickell 62
Letter #98 – Bill McLaughlin 62
Letter #101 – Michael Chezik, USDI, Regional Environmental Officer..... 62
Letter #102 – John Schraufrasel 67
Letter #103 – Barry Frantz, USDA, Natural Resources Conservation Service, Soil Conservationist 68
Letter #104 – Alex Denmarsh 68
Letter #120 – Amelia Trevelyan..... 69
Letter #121 – Rachel Martin 69
Letter #127 – Joseph Martin 70
Letter #128 – Paul Brown 70
Letter #129 – Allegheny Defense Project 71
Letter #130 - Note signed by Denise Roberts attached to petition forms containing 263 signatures (see project file for complete petition)..... 174
Letter #131 – Michael Hepinger..... 174
Letter #132 – Susan Swanson, Allegheny Hardwood Utilization Group, Executive Director..... 175
Letter #133 – Stacy McCormack..... 176
Letter #134 –Robert Leslie 176
Letter #135 – Ray Egger 177
Letter #138 – Dale Anderson, Pennsylvania Forest Industry Association, President 177
Letter #139 – Mark Donham, Regional Association of Concerned Environmentalists, President..... 178
Letter #140 - Bill Brainerd 179
Letter #141 – James Rauch..... 179
Letter #142 –Jim Bensman, Heartwood 183
Letter #143 – John Forren, US Environmental Protection Agency, Program Manager..... 184
USDI Fish and Wildlife Service Concurrence Letter 186

Comments Received During the 45-Day Comment Period for the East Side Draft EIS and Forest Service Responses

Letter #1 – Paul Riley

Comment 1-1

The EIS summary you have sent me allowed me to further my understanding of the complicated and varied alternatives of forest service management. My comments and reactions were:

Comment noted.

Comment 1-2

1-no salvage harvesting of dead and declining trees, wildlife depends on this needed ford [sic] supply for survival.

Comment noted. See the Wildlife section of Chapter 3 and appendix C.

Comment 1-3

2-no herbicides. Herbicides are not safe, only damage soil and wildlife, birds.

Comment noted. Please see pp. 164,165 and 210 as well as the Human Health and Safety sections of the FEIS. Also, see Comments 129-59, 129- 60, 129-63, 129-64, 129-65, 129-66, and 129-67.

Comment 1-4

3-No new roads built. Roads damage the ecosystem, annoy fish, birds and wildlife.

Comment noted. Please the Purpose and Need for Action section of Chapter 1. Also, see the discussions of effects in the Soils, Transportation, and Wildlife sections.

Comment 1-5

4-deer management. The only real correction to excess deer populations is wolf reintroduction. I asked the Casey Administration years ago for wolf re-introduction, and ever since the problem is still our of control. Creation had it right "The missing link is indeed a wolf".

Comment noted. Re-introduction of wolves is beyond the scope of the East Side project.

Comment 1-6

5-Alternative 5, no new management is favorable.

Comment noted. See the ROD for the rationale for the selection of the preferred alternative.

Comment 1-7

6-decommission unnecessary roads, and no new roads should be built.

Comment noted. All action alternatives propose road decommissioning. Alternatives 3 and 5 propose no new road construction.

Comment 1-8

7-no logging of old growth trees. Any logging of old growth should be at least half a mile from old growth to protect from wind damage as a buffer area.

Please see Tables 16 and 18. Note that the amount of old growth increases over the next 10 years in all alternatives

Comment 1-9

8-Salvage brushing of harmful insects is favorable.

See the Alternative Considered but Eliminated from Detailed Study section of Chapter 2.

Comment 1-10

9- White pine and hemlock planting if favorable. I do favor removal of maple trees because they are overabundant. Add white ash and mulberry trees will help wildlife. Try adding Elderberry shrubs.

Comment noted.

Comment 1-11

10-Snowmobiles should be on main paved roads only. Other damaging Honda type recreation vehicles should be completely banned from all parks, National forests and wildlife areas in the U.S.A. These do tremendous damage to valuable vegetation.

Comment noted, however, this comment is beyond the scope of the East Side project.

Comment 1-12

11-no new roads in stream areas, decommission all present unnecessary roads to protect wildlife.

See Comment 4-1.

Comment 1-13

12-Alternative 5, no change in vegetation management except those [sic] mentioned above in #8.

See the ROD for the rationale for the selection of the preferred alternative.

Letter #2 – Jeff Volk

Comment 2-1

I'm writing to oppose the proposed East Side timber sale in the Allegheny NF. I am opposed for the following reasons:

Comment noted.

Comment 2-2

Clearcutting has devastating consequences on wildlife habitat, soil erosion, and stream siltation. This sale would clearcut 3,156 acres.

Please the description of alternatives in Chapter 2 for the amounts of treatments by harvest method. See the discussion of effects in the Wildlife, Soils, Water and Watershed, and Transportation sections of Chapter 3 of the FEIS.

Comment 2-3

The sale calls for 17.2 mils of new roads and reconstruction of many more miles. I am opposed to any new road-building on my public lands.

Comment noted.

Comment 2-4

I grew up in Pennsylvania and know the Allegheny well. The East Side proposal is a bad idea. Please cancel it. Thanks for your consideration.

Comment noted. Please see the ROD for the rationale for the selection of the preferred alternative.

Comment 2-5

Thank you for your consideration.

Comment noted.

Letter #s3-5, 30 – (These were submitted as postcards and were all the same)

#3 - Kathryn Koncsal #5 - Ginette Walker
#4 - Kate Rindilo #30 - Frances Haskins

Comment 3-1

I am writing in protest of the East Side Timber Sale.

Comment noted.

Comment 3-2

I object to your plan to log 6,920 acres of the Allegheny National Forest, our public lands.

Comment noted.

Comment 3-3

I also object to the use of the herbicides Round-Up (Monsanto) and Oust (DuPont) .. ..

Comment noted.

Comment 3-4

[I also object to]..the construction and reconstruction of logging roads that are proposed as part of the East Side Project!

Comment noted.

Comment 3-5

Please consider an alternative that looks into ecological restoration through practices such as logging road removal and revegetation of roads and clearcut areas using native plants and seedlings. This restoration alternative should include ZERO cutting, ZERO herbicide use, ZERO stone extraction, and ZERO road construction or reconstruction.

See the Alternatives Considered but Eliminated from Detailed Study section of Chapter 2.

Comment 3-6

The Allegheny National Forest should be preserved for the biotic communities it supports so that local human communities may thrive on a more ecologically beneficial economic base that doesn't require removal of the resource it depends on - these woods!

Comment noted.

Letter #s7, 6, 11, 136, 137 -

#7 - Charles Aston #11 - Jessica Murray #137 - T. Alexander Denmarsh
#6 - Eric Noyes #136 - Stephanie Helsel

Comment 7-1

I am writing in protest of your proposed East Side Timber Sale.

Comment noted.

Comment 7-2

Please provide me with a written response to each of my comments.

Written responses are contained in Appendix G of the FEIS.

Comment 7-3

The following are my public comments on the East Side EIS for the public record:

Comment noted.

Comment 7-4

1. I object to the cutting of 8,206 acres [6,920 ac. in letters #6 & #11] of my public lands.

Comment noted.

Comment 7-5

2. I understand that you intend to log 3,109 acres [2,250 ac. in letters #6 & #11] as "shelterwood seed/removal" cuts, "regeneration" cuts, "removal" cuts and other types of clearcuts. I object to all forms of clearcutting.

Comment noted.

Comment 7-6

3. I also object to all other forms of even-aged management. I understand that "Thinning" cuts are cuts done in preparation of future clearcuts and I object to this cash-induced management of my national forest. I further understand that "Two-age" cuts are cuts in which nearly 50% of the trees are removed in order to create two even ages of forest in an area. I object to this and other forms of even-aged management which damage watersheds and plant life, create a tree-farm out of a forest, and increase fragmentation (the leading cause of losses in biodiversity).

Comment noted. Please see the discussions of thinning and two-age treatments on pp. 154,155, and 156. See the Purpose and Need section of Chapter 1 as well as the direct effects discussions in the Water and Watersheds, Vegetation, and Wildlife sections of Chapter 3.

Comment 7-7

4. I object to the 5,646 acres [5,000+ ac. in letters #6 & #11] of salvage logging included in this project. Your own research (see data from Stout et al 1997) indicates that the assertion that logging increases forest health is dead wrong. Salvage logging results in the loss of biodiversity habitat, and water quality. Salvage logging is a hoax that cannot be scientifically supported.

See the Purpose and Need for Action section of Chapter 1. Also, see the discussions of salvage harvesting in the Vegetation sections, pp. 152-156.

Comment 7-8

5. I object to the proposed use of the toxic herbicides Roundup (Glyphosphate and Oust (Sulfometuron methyl) on 3,082 acres of national forest. These pesticides can be harmful to wildlife and people and should not be used on public lands.

Please see Comment 3-1.

Comment 7-9

6. The endangered Indiana Bats, Bald Eagles, Northern Riffleshell Mussels, Clubshell Mussels and other endangered and sensitive species must be given the utmost protection as required by Congress in the Endangered Species Act. For these reasons this logging project should be halted. Salvage logging which targets dead and dying trees, the primary habitat for Indiana Bats, must be foregone. The recovery of endangered species is a top priority.

The effects to threatened and endangered species are fully evaluated in Appendix C, the Biological Assessment. Please see the Summary of Determinations section of Appendix C, p. C-42.

Comment 7-10

7. I object to the massive amount of road construction proposed in this project. I object to the 17.2 miles of new roads. 1 also object to road "reconstruction" planned for 73.3 miles of logging roads on the Allegheny National Forest. This road work will lead to direct ecological damage as well as secondary problems created by stone pit development and increased access into the Forest.

Comment noted. Please see the Purpose and Need section of Chapter 1 as well as the Transportation section of Chapter 3.

Comment 7-11

8. I object to the development of 12 new and 7 existing stone pits. These pits are a scar on the landscape and a hidden subsidy for logging our public lands.

Comment noted.

Comment 7-12

Please select the following as your preferred alternative in your analysis. Please consider an alternative that would incorporate ecological restoration. This alternative should involve obliteration of logging roads, restoration work in and around streams, replanting (using only native species) of old clearcut areas that have failed to regenerate, and the development of education programs to minimize future drainage to our national forests.

See the Alternative Considered but Eliminated From Detailed Study section of Chapter 2.

Letter #8 – John Kesslick

Comment 8-1

In reference to: Texas Tea Project/Supp. EA April 3, 2000. Please note the following additions and notes.

#1. My terms begin on page 54. In the future (after the 40 EA's) they will appear in the front of my comments.

#2. If there are any words I use in my comments you do not understand please contact me immediately. If I cannot define it I will stop using it.

Additional Terms: Again you do not have to agree, but you will know what I mean.

Law of the Minimum - For any given plant, the primary limiting factor will be the essential element that is most deficient from its optimum level.

Exudates - Exudates are substances that contain photosynthate, and other substances made by the tree. They range from 5% to 40%, which leave by way of the rhizoplane to feed many of the organisms within the soil. A trees form of taxes. As symplast declines exudates increase.

Life - Life is a journey, powered by the sun, of a group of highly ordered and connected chemicals borrowed from the Earth. Death is the end of the journey when all borrowed chemicals are returned to be used again for new life.

Comment noted.

Comment 8-2

Additional Reference: In the future after the 40 EA's I will adjust ref. Listings towards Harvard Style.
[See Project File for complete references listed]

Comment noted.

Comment 8-3

Please send me your definitions pertaining to this project in writing for the list of undefined words below.

A letter was sent to you on 4/14/00 as part of the East Side project addressing this request.

Comment 8-4

The follow is in response to the PROJECT and the Glossary within. Words are very important.

Comment noted.

Comment 8-5

First allow me to tell a story. There was once, a poor guy, who liked alcohol. One day, he drank methanol rather than ethanol. He then quickly learned, as his brain got burned. That words are important after all.

Comment noted.

Comment 8-6

When you use many words with no or misunderstood meanings you begin to create noise. This draft is very noisy to say the least. Many key words describing what is intended to be carried out are not defined. Here is .a partial list of words you have not defined, and I would like you to do so, in order for me to understand what it is you plan to do or what you are claiming to accomplish.. For as it stands I do not understand. I need to know specifically what you mean in this EIS. [Such as: age, conserve, forest, protect, roots, etc.

[See Project File for the list of terms included.]

The terms used in the East Side EIS are commonly accepted terms used by the scientific community and the general public. The definition of terms used in the East Side document can be found in the East Side glossary, "The Dictionary of Forestry" (Society of American Foresters, 1998), or a standard English dictionary.

Comment 8-7

Phrases you use and do not define the root word of.

Forest – in other words what is the definition of a forest in this paper.
Live – Dead – Live residual trees Age class – Serious Insect – Old Growth – Biologically Mature

Clear cut – Live residual trees – Age class – Serious Insect – Old Growth – Biologically Mature

Soil Compaction – Soil Displacement – Soil Group I – Soil Group II – Soil Group III
Soil Profile – Soil Puddling – Subsoil (Did not tell us your definition of soil) What is soil when you use the word?

(I do not know what you are referring to when you say, dying tree or dying trees, dead tree or dead trees or live trees or what you mean when you say healthy tree or healthy trees.) You have not defined any of these singular or plural words. You give us no reference to cambium electrical resistance regarding symplast or the ecological stages, parts, connections and processes of the tree system you refer too. That's what I mean when I say your paper is very noisy.

See Comment 8-6.

Comment 8-8

In reference to: Texas Tea Project/Supp. EA April 3, 2000.
To whom it may concern:

The following are my comments on the **Texas Tea Project/Supp. EA April 3, 2000**. The comments below are numbered so that it is clear what exactly needs to be addressed. Please do not remove any comments from their context and answer all parts of every question. I am asking for a personal response on each question and suggestion. Also if you refer to another citing please list what page specific information can be found pertaining to the question.

These questions pertain solely to the **Texas Tea Project/Supp. EA April 3, 2000**. And no other project that was proposed in the past. However, they may well apply to others.

I have included my terms so as to be clear as to what I mean. You do not have to agree with them, however you will understand what I am saying.

Due to restraints on response time rather than including references per question and statement the references are listed at the end. I do request if this is not good for you, than issue and extension on the comment period and notify me for more preparation.

This comment is directed towards the Texas Tea Supplemental EA.

Comment 8-9

1. Please tell us what you mean in this EA when you say "forest". Please give one definition so I can replace it each time it is used. E.g., "forest health", "forest plan", "reforestation" pertaining to the need and purpose of the sale of ecological stages of trees from this site, the planting and non-native grass and so on.

See Comment 8-6.

Comment 8-10

2. What do you mean when you say "cumulative"?

See Comment 8-6.

Comment 8-11

3. Where in this EA does it address the effect on ecology, regarding log chemistry?

See the Nutrient Cycling discussion, p. 63-64.

Comment 8-12

4. What do you mean when you say habitat?

See Comment 8-6.

Comment 8-13

Indiana Bat –

5. Please define what you mean when you say "expert".

See Comment 8-6.

Comment 8-14

6. Please give a definition of what you mean when you say forest, that can be replaced with the word each time it is used in this Biological Evaluation.

See Comment 8-6.

Comment 8-15

7. You say, "roost trees" which are preferred and needed, have the outer bark intact?

In most cases bark is present on roost trees. However, bats may also roost in cavities in trees with or without bark.

Comment 8-16

8. Do not black cherry trees, when they begin to mature form also an outer bark similar to that of shagbark hickory?

Although black cherry trees may develop bark characteristics suitable for roosting, these characteristics are believed to be less suitable than the bark characteristics of shagbark hickory.

Comment 8-17

9. So then mature, healthy trees with symplast would be very important for the survival of the Indiana Bat and make good roosting sites for a longer period of time? Please give the optimum fertility level for these trees about the rhizosphere (my definition).

This information has not been developed for Indiana bat habitat.

Comment 8-18

10. Now, are not some of the requirements, for a mature healthy tree, the right dose of space, temperature essential elements and water (STEW) and overlooked in this Biological Evaluation?

The BE is based on the best Indiana bat habitat information available.

Comment 8-19

11. Do not companion plants with synergistic effects also play an important role in the survival of their companions. E.g., the bi-carbohydrate transfer, the fixation of atmospheric nitrogen, the tri-carbohydrate transfer including much much more. Also the beauty of the relationship insects have once they die as they bring nitrogen high in the soil. Is not the latter not addressed and overlooked in this Biological Evaluation?

The BE incorporates the best Indiana bat information available. The draft Indiana bat Recovery Plan is the primary source of information. Only elements of the environment, known to play an important role in Indiana bat habitat are addressed.

Comment 8-20

12. Are not many plants which were designed in the same group able to share the same species of mycorrhizae which facilitate the absorption of essential elements and water for plants with symplast, overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-21

13. Does not soil health play an important role in the vitality of the host plants for the Indiana Bat and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-22

14. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, at a specific ecological stage, provide essential elements such as calcium and many others when trees need it thus have positive effect on tree vitality in the specific area for the Indiana Bat and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-23

15. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, at a specific ecological stage, provide water during dry times when trees need it thus having positive effect on tree vitality in the specific area for the Indiana Bat and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-24

16. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, at a specific ecological stage, during decomposition reduce soil erosion and effect soil development, store nutrients and water, provide a source of energy and nutrient flow, serve as seed beds, and provide habitat for decomposers and heterotrophs thus having positive effect on tree vitality in the specific area for the Indiana Bat and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-25

17. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - is not the role of the latter in storing carbon overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-26

18. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Is not an important feature of the latter, that nutrients are released at slower rates over a longer period of time than from fine duff (litter - poor term) thus having a positive effect on tree vitality in the specific area for the Indiana Bat and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-27

19. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, and the slow release of nutients allow nutrients to be retained within the ecosystem until tree population recovers from disturbances such as tornado's thus creating new trees with higher vitality in the long run to support the Indiana Bat?

See Comment 8-19.

Comment 8-28

20. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not timber harvest and salvage after disturbances reduce the pool of stable nutrients thus depleting soil for the plants which the Indiana Bat depend upon having a negative effect on tree vitality in the specific area for the Indiana Bat and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-29

21. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, transfer nutrients by way of fungal sporocarps to the forest floor thus having a positive effect on tree vitality in the specific area for the Indiana Bat while the fine duff (twigs and leaves) fungi immobilize nitrogen, but the logs actively transfer it to the soil and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-30

22. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, at a specific ecological stage, have the potential to become active parts of the soil system as soil wood thus having a positive effect on tree vitality in the specific area for the Indiana Bat and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-31

23. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, perform many physical, chemical and biological functions in the eco-system thus having a positive effect on tree vitality in the specific area for the Indiana Bat and other endangered species and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-32

24. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, have the ability to protect new seedlings and plants from livestock damage and deer thus having a positive effect on tree vitality in the specific area for the Indiana Bat and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-33

25. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, have the ability to be a key habitat component (especially large logs) for many forms of wildlife with the potential of indirectly helping the Indiana Bat and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-34

26. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, disrupt air flow and provide shade, insulating and protecting new forest growth thus effecting most of the endangered species in a positive way and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-35

27. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, play an important role in the absence of nitrogen fixing plants and are sites for nonsymbiotic nitrogen fixation and very significant and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-36

28. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, at a specific ecological stage, provide excellent sites for the formation of ectomycorrhizal thus having a positive effect on tree vitality in the specific area especially the shagbark hickory for the Indiana bat and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-37

29. Do not ectomycorrhizae help trees absorb essential elements and water and play important roles in the food chains of many small animals and their larger predators with their fruiting bodies and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-38

30. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not ectomycorrhizae absorb moisture and essential elements and translocate them to their host plants, making ectomycorrhizae essential for the development and maintained health of a forest which contains hickory which the Indiana Bat depend on and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-39

31. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Is not the latter, and the abundance of, a good indicator of a healthy, functioning forest soil thus having a positive effect on tree vitality in the specific area for the Indiana Bat and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-40

32. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Is not the latter with humus and the upper layers of mineral soil that would be rich in organic matter the primary substrates for the development of ectomycorrhizae thus having a positive effect on tree vitality in the specific area for the Indiana Bat and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-41

33. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, at a specific ecological stage, provide shelter for the survival of certain organisms during fire and also reduce fire problems when there is soil contact and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-42

34. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, enhance or maintain wildlife habitat, particularly in riparian zones overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-43

35. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, play an important role when present, with stream ecology overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-44

36. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, in some case take several hundred years to become fully incorporated into the forest floor and play an active role in the soil system and overlooked in this Biological Evaluation and other sales in this area for the history of the presence of the US FOREST SERVICE in timber sales on the Allegheny? Please define your terms in your response especially "foster" and "forest".

See Comment 8-19.

Comment 8-45

37. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, by leaving these materials behind without removing, not designed to immediatley replace the present forest floor and mineral soil organic matter, but ensure their replacement over the next 100 years or more and in this specific area for the Indiana Bat and other endangered species and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-46

38. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, play key roles in stream dynamics and animal activity and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-47

39. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, at a specific ecological stage, act as a sponge to absorb water and retain much of that water throughout the following growing season. Is not this water supply particularly important for seedling establishment, especially where available soil water would otherwise be insufficient for surviving summer drought or for maximizing growth in highly competitive situations thus having a positive effect on tree vitality in the specific area for the Indiana Bat as well as other endangered species and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-48

40. Regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs - Does not the latter, play a key obligatory role in what would be truthfully called natural regeneration of a site where there was depletion of such valuable ecological natural components of a natural forest and overlooked in this Biological Evaluation?

See Comment 8-19.

Comment 8-49

41. Has any work been done to determine a mean for the Cambium Electrical Resistance (CER) if the trees the Indiana Bats choose? If not why not?

See Comment 8-19.

Comment 8-50

42. It states that the Indiana Bat uses road ruts during summer months for drinking water. What herbicides are applied to the roadways and areas that may have standing water?

We responded to this same comment from you for the FEIS for Threatened and Endangered Species on the ANF in July, 2000. You have a copy of this FEIS. Please see page F-34, Comment 132.

Comment 8-51

43. What effects can these chemical mixtures have on the Indiana Bat? Please provide published reviewed and placed in International Journal references.

See Comment 8-50.

Comment 8-52

44. What do you mean when you say dead?

Trees with no leaves, that are not photosynthesizing.

Comment 8-53

45. What do you mean when you say live?

Trees with leaves with functioning systems.

Comment 8-54

46. You say there are 2.4 billion live trees and over 303 million dead trees. How many tons per acre is there of coarse woody debris and of what size?

We do not have a figure for CWD in tons per acre, but data suggests that there are about 500 to 1300 cubic feet per acre of down and dead wood in second growth northern hardwood stands on the ANF.

Comment 8-55

47. What benefit is there to endangered species by the removal of ecological stages of tree trunks and the injury, that such involves, below and above ground?

Opening canopies to allow sunlight to penetrate the stand increases the thermal temperatures for roosting and improves foraging habitat (Appendix C pp. C-9).

Comment 8-56

48. When you say or address the amount of maternity colonies in this project area, would you say that there may be a substantially larger amount present than your study shows being present. In other words just because you have not found them, would you say that concludes non-existence of additional or are you saying because you have not seen them they do not exist?

Indiana bat maternity colonies may be present on the ANF, although we have not found any yet.

Comment 8-57

49. Northern Long-Eared Bat - 49. In regards to trees, would you not say mature - healthy trees such as Black Cherry and Hickory make suitable roosts with their unique outer bark as they begin to mature?

Hickory may be more suitable than Black Cherry. Northern long-eared bats also utilize cavities for roosting.

Comment 8-58

50. I believe the same questoins regarding Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs and companion plants need to be addressed for this creature as well. Please do so here.

See Comment 8-19.

Comment 8-59

Water Shrew –

51. I am very impressed and enjoyed this information.

Comment noted.

Comment 8-60

Butternut –

52. Some cankers are indicators of lack of water during dry times. Maybe the section on Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs and companion plants need to be addressed for this woody shedding perennial plant as well. Please do so.

See Comment 8-19.

Comment 8-61

53. Sounds like this tree may have a chance within somewhat close distance to a large ECO-ART NURSE LOG that just provided a little shade to the side and water during dry times which may be the reason for the canker as a sign. STEW would be managed somewhat by the ECO-ART NURSE LOGS. Please address this.

See Comment 8-19.

Comment 8-62

54. What are the trees companions in undisturbed forest which contain these trees? Where can they be found in undisturbed areas?. What is the CER mean?

See Comment 8-19.

Comment 8-63

Eastern Small-footed Bat - 55. So it seems the species of trees, vitality of trees, companions of these trees which they are thought to be associated with, could be any tree present now. Is this not true?

We have not documented the presence of the Eastern small-footed bat on the ANF in the 3 years of extensive bat surveys. Therefore, we do not feel we have the habitat conditions necessary to support this species.

Comment 8-64

56. Is there any information showing that bats may have a direct relationship with the ecological stages such as Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs of trees?

Not that we are aware of.

Comment 8-65

57. It sounds as if each and every ecological stage of a tree, of roughly, lets say for simplicity, a standing tree with 200 increments of growth at breast height (trunk) and still maintains a symplast, and lets say up to 200 increments of the remaining symplastless ecological stages above and below ground, are equally as important with many different groups of organisms associated with each stage that makes up a forest (my definition). Each and every cell of the tree is born alive. The conditions present do effect cell formation and birth effects. So as we can see trees can be a very complex organism made up of many organs with many ecological stages.

Comment noted.

Comment 8-66

58. Maybe the Eastern Small-footed Bat requires mature with high vitality or over mature Black Cherry. Would you not agree? Even considering that, as trees mature, exudates increase, thus allowing increased carbohydrate transfer. Thus having another ecological condition contributing to growth and health of companion plants and associated organisms. Who has published work on this regarding harvesting of trees and the endangered species?

We have not documented the presence of the Eastern small-footed bat on the ANF in the 3 years of extensive bat surveys. Therefore, we do not feel we have the habitat conditions necessary to support this species.

Comment 8-67

American Burying Beetle –

59. Is not this Beetle very connected with large (300-400) incremental old hemlock Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs and the ecological stage where a orange sporocarps, with a white boarder has formed?

This species has not been documented on the ANF.

Comment 8-68

60. Has there not been a serious decline in the populations of Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs since the taking began when the settlers began the taking process?

Volume of coarse woody debris is greater in Old Growth stands on the ANF than in second growth stands.

Comment 8-69

61. If these Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs play a role in this insects life cycle and you are removing more of what would reach that ecological stage in the future to provide for the needs of this wonderful organism, how can the non-presence now be claimed as proof that your timber sale will not increase the problem at hand and ruin future desired conditions for this "creature"?

This species has not been documented on the ANF.

Comment 8-70

62. You say "occupied habitat for this species" What do you men when you say habitat?

See chapter 6, Glossary.

Comment 8-71

63. You say "occupied habitat for this species" What do you men when you say "occupied"?

The species is known to be present.

Comment 8-72

64. You say "occupied habitat for this species" What do you men when you say "documented"? What is the scope (your definition) of this documentation?

Documented means "confirmed to be present". In most cases this means that the species has been seen or heard by a reliable source.

Comment 8-73

65. What are the tons per acre of Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs in the areas where you looked for this "creature"?

See Comment 8-19.

Comment 8-74

66. What are the tons per acre in this project?

See comment 8-19 and 8-54 above.

Comment 8-75

67. Here we have a site with a, I assume, a history of clear cutting, removing many of the ecological stages of trees (see my comments on Indiana Bat Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs). Where herbicides have been used to kill all plant life above ground and below ground (at least one of the products you use claim on TV to kill roots and "ALL") not to mention planting non-native grass to the project areas. Now you have this condition as a result of your treatments with no presence of this creature, who I would assume is a forest (my definition) creature, so you say you want to continue what you have been doing because the creature is not here so if the creature is not here continuing to do what we have been doing to get these results is the answer?

American burying beetles were searched for in Old Growth habitats where no disturbance or treatments have occurred.

Comment 8-76

68. In other words to know where you are going you must know where you are and how you got there. Where are you at?

Comment noted.

Comment 8-77

69. Is this creature a forest creature associated with trees as they were designed?

American burying beetles have been found in a variety of habitats including some non-forested conditions (e.g. Sandy beaches).

Comment 8-78

Small Whorled Pogonia –

70. You say deer may be the limiting factor?

Yes, Deer are known to browse this orchid.

Comment 8-79

71. Since 1987, how many acres have been polluted with toxic non-selective herbicides?

Herbicides used on the ANF have been carefully selected after extensive analysis and detailed consideration of their environmental consequences, including effects on the treated sites, potential human health effects, and potential effects on wildlife and aquatic species. They are selected and applied to control the target vegetation. That analysis has been documented in two EIS documents and amendments (USDA-FS 1991 and USDA-FS 1997). Specific treatments are evaluated as part of site-specific proposals. The responses to Comment 9-61 and 15-10, provide additional information. Since 1987, herbicide treatments designed to help desired tree seedlings and plants develop have totaled 17,051 acres while those designed to maintain rights-of-way have totaled 1,166 acres. Minor acreages have been treated to prepare sites for wildlife treatments.

Comment 8-80

72. Do these mixtures kill the roots and all?

Yes.

Comment 8-81

Units of measure in ANF records show pounds of active ingredient as the measure of the amount of herbicide applied. Some materials come as a dry product while others are formulated as a liquid. Using pounds permits consistent tracking. The table below displays the total pounds of each herbicide active ingredient used on the ANF since 1987. Concentrations displayed below are expressed as a range of the amount of active ingredient applied per acre. Concentrations vary depending upon the type and density of vegetation selectively treated on each site, the type of site, and the method of application. The majority of the treatments conducted on the ANF are close to the low end of the ranges shown. Additional information regarding concentrations can be found in the two environmental impact statements that cover herbicide use on the ANF (USDA-FS 1991, Chapter 2 pp 6 & 7 and USDA-FS 1997, Chapter II pp 19 to 23 and Appendix B p 8). Historical herbicide use since 1987 is displayed by treatment objective…first for silvicultural treatments completed to achieve site preparation objectives and secondly for right-of-way maintenance.

Treatment Objective Active ingredient concentrations per acre	Herbicide Active Ingredient	Total Pounds Applied 1987-2000
Site Preparation 1.0 to 2.0 lbs	Glyphosate	13,501
.09 to .19 lbs	Sulfometuron methyl	1,238
Right-of-Way Maintenance .5 to 6.0 lbs	Glyphosate	564
.25 to 3.0 lbs	Triclopyr (ester)	406
.083 to 1.0 lbs	Picloram	279
.025 to .3 lbs	Imazapyr	20
1.0 to 9.6 lbs	Fosamine Ammonium	635
.25 to .75 lbs	Metsulfuron Methyl	3

Comment 8-82

74. Do these plants require essential elements?
75.Do these plants require water?
76. Do these plants require water during dry times?

Yes

Comment 8-83

77. How many tons of ECO-ART NURSE LOGS/ what would have been Coarse Woody Debris and Soil Logs have been removed in the last 50 years in this 227,00 acres?

See Comment 8-54.

Comment 8-84

78. Review my comments of the Indiana Bat regarding ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs and the protection they offer for plant life and address and comment.

See Comment 8-19.

Comment 8-85

79. How many acres of grass (non-native to the area) have been planted in these 227,000 acres?

None. See comment 8/11 above.

Comment 8-86

80. How many miles of roads are in these areas?

See the Transportation section of Chapter 3. Also, we surveyed for Small whorled pagonia prior to road construction in this area.

Comment 8-87

81. How many miles of what were roads have had grass (non-native) planted on them and not considered roads anymore so you can build more roads?

See the Transportation section of Chapter 3. Also, we surveyed for Small whorled pagonia prior to road construction in this area.

Comment 8-88

82. You do really know how to build roads!

Comment noted.

Comment 8-89

83. Stop blaming the deer!

Deer have been documented as browsing Small whorled pogonias in PA.

Comment 8-90

84. Oh, yes, please provide, which you have yet to provide, research specific reviewed and published on the effects of the mixtures of chemicals in which you use to kill organisms above and below the ground. Be specific to findings on effects on all endangered species. E.g. you mix two chemical solutions from two separate manufactures [sic] with a new mixture and no MSDS for the new mixtures. The manufactures have no claims on their products when mixed with others. They said contact you and you have not provided such information except a report of miscarriages among USFS employees with marking paints or herbicides suspected!

We responded to this comment in the FEIS for threatened and endangered species on the ANF (July 2000). Please see pages F-34 through F-38 for detailed information.

Comment 8-91

Wiegand's Sedge –
85. In the areas where this plant has been found, what was the tons per acre of coarse woody debris?

This is a wetland plant. CWD is very low in most wetlands.

Comment 8-92

86. How do herbicides and ammonium nitrate which are applied in this ANF area effect soil chemistry regarding the needed conditions for these plants to start their life? (Please provide optimum fertility levels for these plants. Taken from about the rhizosphere (my definition).

No herbicides and fertilizers are used in wetlands on the ANF. Therefore the comment is not pertinent.

Comment 8-93

Summary of Species with No Suitable Habitat.

87. Which of these endangered species do not have a naturally design connection with Log Chemistry/ECO-ART NURSE LOGS/Coarse Woody Debris/Soil Logs. Please provide research to show their natural habit does not require the latter.

Habitat for all TES species is provided in Appendix C (pp. C-2 through C-16).

Comment 8-94

Easter Cougar –

88. You state "due to the level of human activity, particularly recent oil and gas development and private land influences the ANF does not provide suitable habitat to maintain a viable populations". Now, when you claim to do "re" forestation would that not be to bring back as many of the natural associates of trees and conditions as possible such as eco-art nurse logs and the stopping of planting of non-native plants such as the non-native grasses and the stopping the additions of non-native chemical solutions such as herbicides which kill organisms and disrupt cells and organs above and below ground? Not to mention the stopping of extracting the very important ecological stages of trees that are and are to be as once were, this place was created?

A viable population of Eastern cougars has not been documented on the ANF.

Comment 8-95

Canada Lynx-

89. Would not then a "re" forestation act be closing some of the roads?

The Canada lynx has not been documented on the ANF.

Comment 8-96

90. These activities can effect the chances of this wonderful animals survival. Why reduce the problems for this creature of creation and start with ourselves. God can take care of the rest but if we do not do our part then we are the problem. Lets close some roads of this supposed to be "forest" and work on doing the right thing. People are the biggest problem with the biggest machines of the demons of D a forest ever had. Restoration work like closing roads would be a great way to make amends for mistakes and welcome the forest back (my definition). More roads and more cutting and more planting of the non-native grass is the worse thing to do at this time.

Comment noted.

Comment 8-97

91. To say, since we have been doing things this way for so long and now habitat is gone, so why change now? Keep cutting and herbiciding? At a cost to the tax payer?

Comment noted.

Comment 8-98

General Comments

92. How many acres had most of the nurse logs removed in the last 50 years for the purpose of faulty intelligence believing it was for forest health, i.e., under the impression it was to increase forest health? What are you doing now.

The Allegheny National Forest Land and Resource Management Plan documents the standards and guidelines used on the Forest. All standards and guidelines are followed when the Forest Plan is implemented at the project level.

Comment 8-99

93. Please list the species of trees to be removed in this area and their profiles such as are they true heartwood trees, false heartwood trees or trees which form no heartwood in the stem or woody root. Please contrast heartwood and list the other profiles for these species. Including optimum fertility levers and CER means.

Data concerning tree species is contained in the CDS database which is part of the project file. The type of heartwood a tree exhibits is not part of the data we collect.

Comment 8-100

94. Has a Shigometer been used to determine tree vitality and the quality of the material that is to be removed? If not why not?

The use of a shigometer is not necessary for implementing the Forest Plan.

Comment 8-101

95. What is the reason for this project that includes the removal of ecological stages of trees?

Please the Vegetation section of chapter 3 and Appendix B for the reasons for the various prescriptions proposed in the East Side project.

Comment 8-102

96. Somewhere in the original plan was not the purpose to provide money to the community?

Please see the Purpose and Need section of Chapter 1.

Comment 8-103

97. Would it not be wise for the community to receive their 25% fund without being dependant on timber sales and would this not take some of the pressure off of you to remove valued ecological stages of trees which enhance the health and beauty of the natural system?

This comment is beyond the scope of the East Side project.

Comment 8-104

98. Would not the communities lack of dependence on timber sales create a more comfortable condition for you to do what is right for "forest (my definition) health"?

This comment is beyond the scope of the East Side project.

Comment 8-105

99. In the case that the communities were not dependant for the 25% fund, would you still receive great pressure from the private industry making it difficult to preserve and restore this once fertile forest?

This comment is beyond the scope of the East Side project.

Comment 8-106

100. What are you doing?

Please see the Purpose and Need section of Chapter 1.

Comment 8-107

101. What is the scope of the project?

Please see the Purpose and Need section of Chapter 1.

Comment 8-108

102. What boundaries of a scope (your definition) is there when it comes to protection and preservation of endangered species?

Please see the Biological Assessment, appendix C.

Comment 8-109

103. Here is an example, of where I am coming from. I.e., respectively speaking of being dead or alive. You take a plane, flying over, is it dead or is it alive? How about a bus traveling down the road - dead or alive? You take a train traveling down the tracks, is it alive or is it dead? You take a boat, on the ocean, on a lake, on a river, is it alive or is it dead, the boat that is? You take a tree in any ecological stage, is it alive or is it dead? Not to promote or encourage the worshipping of trees, but to understand if we must begin to stop hurting trees of a forest (my definition or yours), we must begin by understanding the organisms or creatures, which are present. Do not believe it because I said it but believe because you see it for yourself.

Comment noted.

Comment 8-110

104. Is wood dead or alive?

It can be either.

Comment 8-111

105. I know of no scientific research to back up the following misconceptions.
106. Removal of nurse logs increases or maintains the present health of the forest (my definition).
107. Road building increases or maintains the health of the forest(my definition).
108. Salvage logging increases or maintains the health of the forest (my definition).
109. Planting grass in the forest is beneficial for the trees of the forest (my definition).
110. Planting grass increases the health of the forest (my definition) or maintains it.
111. Applying synthetic or non-synthetic herbicides increases or maintains the health of the forest (my definition).
112. Herbicides do not harm the living soil (my definition).
113. Applying synthetic fertilizer, ammonium nitrate, increases or maintains the health of the forest (my definition).
114. Changing water patterns increases or maintains the health of the forest (my definition).
115. Removing trees, dead living or dying, before they are able to return to the soil what they have removed increases or maintains the health of the forest (my definition).
116. Thinning or trees rather than allowing the self-thinning rule of ecology to do what nature does best increases the health or maintains the health of the forest (my definition).
117. Removing dead trees increases the health or maintains the health of the forest)my definition).
118. Planting hardwoods in conifer soils, or vice versa, increases or maintains the health of the forest (my definition).
106. Chipping mills increase or maintain the health of the forest (my definition).
107. Cutting trees reduces mud slides and increases the health of the forest (my definition).
108. Insects are the primary cause of forest health decline (my definition).
109. Salvage logging decreases morbidity and mortality of the forest trees (my definition).
110. Timbering practices reduces forest fires (m definition).
111. Drought has caused forest decline (my definition).

Please see the Literature cited sections of: the Allegheny National Forest Land and Resource Management Plan, the Final Environmental Impact Statement for Vegetation Management on the Electric Utility Rights-of-Way, the Final Environmental Impact Statement for Understory Vegetation Management, and the East Side FEIS.

Comment 8-112

I would like to thank the US FOREST SERVICE for the protection and preservation of the Tionesta Scenic area (Virgin Old Growth) including but not limited to the Tornado Swath of 1986 where nothing was removed as well as Hearts Content. This act of good stewardship is unparalleled and needs to be the rule rather than the exception in this project area. It's nice to see what things look like when things go right. Also thank you for getting honest and starting to see trees do not have to be removed from a forest (my definition) to have a healthy forest (my definition). If you have any questions feel free to call.

Comment noted.

Comment 8-113

Due to time constraints, references are limited.

Comment noted.

Comment 8-114

Please explain why response time is so limited on such a large proposed soil depleting proposed operation.

The 45 day comment period conforms with 40 CFR 1506.10 and is an appropriate amount of time to comment on a project such as this.

Comment 8-115

List of 385 references. See Project File for complete list.

Comment noted.

Comment 8-116

MY TERMS You do not have to agree, however you will know. what I mean. February 29, 1999 Some of My Terms.

Comment noted.

Comment 8-117

I request my terms be considered a part or my response to the proposed East Side Project and placed with my statements and questions in the EIS. (Such as: ability, conductivity, decay, organism, etc. See Project File for the list of terms included.)

Comment noted.

Comment 8-118

"A Call for Sound Science on the Management of Ecolgical [sic] Stages of Trees and Their Associates"- see attached manuscript by John A. Keslick, Jr., in Project File.

Comment noted.

Comment 8-119

"FORESTRY VERSES [sic] GYPSY MOTH Salvage logging" –
see attached paper by John A. Keslick, Jr. in Project File.

Comment noted.

Comment 8-120

"The Seen and Unseen World of the Fallen Tree" by Chris Maser and James M. Trappe - see attached manuscript in Project File.

Comment noted.

Letter #9 –Devin M Scherűbel, Heartwood

Comment 9-1

Thank you for the opportunity to comment on the proposed East Side project.

Comment noted.

Comment 9-2

Logging is an inappropriate use of public forests and is contrary to the public interest. Heartwood, therefore, opposed this sale.

Comment noted.

Comment 9-3

Additionally, the Purpose and Need needs to indicate the true purpose and need for the project (i.e., to approve logging so that money can be illegally skimmed from the KV fund to support the Forest Service bureaucracy.) The Forest Service is so far out of control that many times it claims it does not have to obey the law, because there were no comments indicating the law should be followed. Therefore, we wish to raise the issue that of all laws that apply to the project need to be followed.

See the Purpose and Need section of Chapter 1. All laws and regulations have been followed during the East Side analysis process.

Comment 9-4

PUBLIC OPINION –

A scientific poll conducted for the Forest Service revealed that most Americans oppose logging, mining, and grazing on public forests. (Bruce Hammond, "Forest Service Values Poll Questions Results and Analysis." The question was, "Natural Resources in Public Forests and Grasslands Should be Made Available to Produce Consumer Goods." Forty-seven percent disagreed with 26 % strongly disagreeing. Seventeen percent had no opinion and 36% agreed. Statistically this represents a significant disagreement with the statement.) In May 1996, ICR Survey Research Group conducted a nation-wide public opinion survey for Lake Research. The survey found most Americans support "ending commercial logging ... on all federal publicly owned lands." Several states also have conducted public opinion surveys which have found most people in that state do not want their National Forest logged. The most recent nationwide public opinion survey [Republican Pollster American Viewpoint conducted a national survey of 1,000 registered voters for the Heritage Forests Campaign from December 28, 1999 through January 2, 2000. All interviews were conducted by telephone. The margin of error for this study is ±3.2%.] asked, "In general, do you favor or oppose allowing logging, mining, and other industrial activities on National Forest lands?" Sixty percent (including 43% strongly) were opposed and only 31%, (including 10% strongly) were in favor. Another nationwide public opinion survey (National Survey conducted by Market Strategies, Inc. and Lake, Sosin, Snell, Perry and Associates, Inc. N=800 registered voters June 22-25, 1998. Market Strategies, Inc. has conducted polls for Newt Gingrich, Bob Dole, George Bush, and Gerald Ford.) asked: "There has been a national debate about whether the U.S. Forest Service should continue to sell timber from our national forests. Do you favor or oppose continuing to allow timber companies to log in our national forests? (IF Favor/Oppose ASK:) And do you STRONGLY (favor/oppose) this or just SOMEWHAT (favor/oppose) this?"

The results were: Strongly favor, 7%; Somewhat favor, 17%; Neither [VOL], 2%; Somewhat oppose, 19,ted among men, deriving their just powers from the consent of the governed, that whenever any form of government becomes destructive of these ends, it is the right of the people to alter or to abolish it. . ."

Alternatives, which are not connected to logging, must be developed and considered to respond to the majority of Americans who do not want their National Forests cut down. In Sierra Club v. U.S.D.A., 1997 WL 996308 (S. D. Ill. September 25, 1995) aff d by order adopting opinion 116 F.3d 1482 (C.A. 7 (111) 1997), the Court ruled that while the Forest Service is allowed to log National Forests, the Forest Service is not required to cut down the public's forests. "The Forest Service was created by and for the people. Hence, we communicate with and listen to the public ... The results on the ground reflect ... full and fair consideration of public opinion." The Forest Service Ethics and Course to the Future October 1994. The Forest Service should "serve the people" as it claims to do. Claiming that what the majority of Americans want is "beyond the scope of the analysis" is ignoring the public and subverting democracy. Additionally, defining the purpose and need so narrowly to exclude alternatives that do not cut down the public's forests is illegal. Since there is legislation in Congress to end logging on public lands, an alternative must be developed to manage the area in the manner prescribed in HR 1396, the National Forest Protection and Restoration Act. (More than 175 environmental and religious groups and businesses have endorsed the legislation. A list is available upon request.)

The no-action alternative does not adequately respond to the wishes of the majority of Americans who do not want their natural heritage converted into stumpland. The no-action alternative has almost no chance of being selected due to all the time and money invested in developing the project. For example, in an May 9, 1997, appeal resolution meeting, Hoosier National Forest Supervisor Ken Day stated, "I don't want to go through all these documents and then declare, all this work, and then say "Okay I'm gonna select a no-action alternative and not do anything afterwards.'Why do the analysis?"

In 1998, we did a nationwide FOIA request to find out how often the Forest Service selects the no-action alternative for a proposed timber sale. The results were:

- Number of proposed timber sales in the last 5 years with No-Action Alternative selected: 8
- Number of sales, with No-Action Alternative selected since Michael Dombeck became Chief on January 6, 1997: 0
- Last time No-Action Alternative Selected: December 13, 1996
- Acres of timber proposed to be cut for which No-Action Alternative selected in last five years: 7,362
- Acres logged in the last five years (from TSPIRS reports): 4,168,282

Comment 9-4 cont.

- In the last five years, the Forest Service logged 567 times more acres than they selected the no action alternative for.
- " [The] Forest Service prepares 4,000 to 5,000 environmental assessments annually, of which about one-half are for timber sales. In FY 1997, Forest Service awarded contracts for 232,110 timber sales." USDA/OIG-A/08801-10-At at 4.

If there is a range of alternatives that have projects other than logging, the Deciding Officer would have alternatives that respond to public will and provide projects for all the time and money invested in the analysis. If there is not an alternative with only non-logging projects, the Forest Service will have ended its inquiry at the beginning as there will be a pre-determined result of logging in the project area.

Comment noted. See Alternatives Considered but Eliminated from Detailed Study for a discussion of alternatives, other than no action, which do not propose any timber harvesting. See Comment 129-115 for a response to the section of this comment regarding the allegation that the Forest Service never selects the No Action alternative.

Comment 9-5

NEED FOR TIMBER SALE –

The analysis needs to address the need for the timber sale. Just because the Forest Plan allows timber sales, one cannot conclude there is a need for the sale. The Forest Service must disclose site-specific monitoring data which demonstrates that there is a need for the sale.

See the Background and Purpose and Need sections of Chapter 1.

Comment 9-6

The need analysis must also address why natural processes will not create enough early successional habitat. If the analysis claims a need for early successional habitat, the analysis must demonstrate that there is a need for the type of habitat that the Forest Service creates as opposed to the type of early successional habitat that is created naturally.

This is a Forest Planning issue and beyond the scope of the East Side project.

Comment 9-7

We also request that the MIS species for early successional habitat be changed to the only creature that truly requires the type of habitat (devastation) created in Forest Service timber sales: Forest Service bureaucrats.

Comment noted.

Comment 9-8

BIODIVERSITY & FOREST FRAGMENTATION –

The issue of biodiversity and forest fragmentation needs to be considered. In an interview, former Chief Jack Ward Thomas summed up why these issues are so important: "First don't let habitat situations get so bad that species get listed. That's playing Russian roulette. Once a species gets listed as threatened or endangered, it quickly slips out of anybody's hands and into the hands of the regulatory agency. That means you get ahead of the situation. You ask "How are we going to address this circumstance in a rationale, reasonable fashion, in a coordinated manner so that it is not necessary to list the plant or animal?" . . . One would not want to repeat the exercises of the Pacific Northwest where nobody would face the issue and everybody continued to twist away from the inevitable. If you look at the history if that particular issue, solutions were proposed and rejected, back and forth. The social and economic impacts kept increasing with each rachet. The earlier you can address these issues, the more chance it will be addressed rationally with minimal impact. The longer you wait, the more options you lose, and the more dramatic the effect becomes in the end." (Seeing the Forests and the Trees: An Interview with Jack Ward Thomas. "Wisconsin Natural Resources," April 1995.)

See the Wildlife section, p. 205.

Comment 9-9

It is time to act to protect neotropical migrants and biodiversity in general. The longer the Forest Service waits, the worse the problem becomes.

Comment noted.

Comment 9-10.

Biodiversity and forest fragmentation must be addressed in regard to all species, not just birds. This includes, but is not limited to: mammals, invertebrates, plants, insects, micro-organisms, reptiles, and amphibians. The degree to which this area provides a biological corridor and its value should be considered. Sampling effects and minimum area requirements of all species should be addressed. The impact of cowbird parasitism and predation to forest interior birds should be prominently considered. The analysis of the impacts to forest interior birds needs to address nesting success. Some studies have documented forest interior birds in recently logged areas. The presence of these species in these areas normally indicate that the species are being harmed. Forest interior birds normally do not successfully reproduce in recently logged areas. These areas, in essence, have become ecological traps. The need for large tracts of forests should be considered. (Robbins, Chandler S., Deanna K. Dawson, and Barbara A. Dowell, "Habitat Area Requirements of Breeding Forest Birds of the Middle Atlantic States." Wildlife Monographs No. 103, July 1989.

Solheim, S. L., W.S. Alverson, and D.W. Waller, "Maintaining Biotic Diversity in National Forests: The Necessity for Large Blocks of Mature Forests." Technical Bulletin Vol. 4 No. 8, School of Natural Resources, the University of Michigan.

Robinson, Scott K. and David S. Wilcove, "Forest Fragmentation in the Temperate Zone and its Effects on Migratory Songbirds." Bird Conservation International 4:2330-249.)

A study published in Science contained these findings and recommendations for neotropical migrants:

"Nest predation and parasitism by cowbirds increased with forest fragmentation in nine midwestern landscapes that varied., from 6 to 95 percent forest cover within a 10-kilometer radius of the study areas. Observed reproductive rates were low enough for some species in the most fragmented landscapes to suggest that their populations are sinks that depend for perpetuation on inunigration from reproductive source populations in landscapes with more extensive cover.

"Our results suggest that a good regional conservation strategy for migrant songbirds in the midwest is to identify, maintain and restore the large tracts that are most likely to be population sources. Further loss or fragmentation of habitats could lead to a collapse of regional populations of some forest birds. Land managers should seek to minimize cowbird foraging opportunities within large, unfragmented sites. In more fragmented landscapes, the reduction of cowbird parasitism may require trapping and large scale restoration efforts, whereas reduction of local forest edges may reduce nest predation and increase mating success.... Increasing fragmentation of landscapes, however, could be contributing to the widespread population declines of several species."

(Robinson, Scott K., Frank R. Thompson 111, Therese M. Donovan, Donald R. Whitehead, & John Faaborg, "Regional Forest Fragmentation and the Nesting Success of Migratory Birds." Science Vol. 267 March 3 1, 1995 pages 1987-1990.)

The analysis needs to consider these findings and recommendations. A follow-up study conducted in a heavily forested area concluded:

The conclusion is that some management practices (clearcuts, forest openings, and possibly regeneration openings) may cause a reduction in the reproductive success of birds nesting in adjacent forest. Rates of parasitism are significantly higher for many species in these contexts and daily nest mortality is also slightly higher. Cowbirds appear to be preferentially attracted to openings within the forest and then direct much of their nest-searching activity into forest adjacent to the openings.

It follows from this that the quality of a forest tract as a "source" will depend on the structure of the landscape within the forest tract. Tracts with many internal openings and edges will, in general, produce fewer young per nesting attempt than tracts with few disturbances. Accordingly, management for viable populations of NTMB should involve minimizing the amount of internal opening and edge.

Whitehead, Donald R. "The Effect of Landscape Pattern and Timber and Wildlife Management Practices on the Reproductive Success of Neotropical Migrant Landbirds in South-central Indiana." November 1995. The following additional studies also need to be addressed: Winslow, Donald E., Patrick J. Doran, Donald Whitehead, Grant M. Greenberg, Matthew A. Koukol, Elizabeth A. Geils, R. Bernadette Slusher, & Thomas B. Ford, "The Reproductive Success of Forest-Dependent Songbirds in South-Central Indiana: Effects of Forest Management Practices" and Doran, Patrick J., Donald R. Whitehead, Donald E. Winslow, "Within-Landscape Patterns of Land Cover and the Nesting Success of Neotropical Migrant Birds in South Central Indiana."

The analysis needs to consider these findings.

Anticipated effects related to fragmentation were evaluated at the landscape and sub-watershed scales (pp. 205) and effects are discussed on pp. 221-223. As described, and based upon on-Forest monitoring, effects of forest fragmentation are expected to be less than those documented in more

Comment 9-10 cont.

fragmented landscapes. Although wildlife distribution and use may shift as preferred habitats become available or are lost, based on the analysis provided, effects to the wildlife resource will not be significant under any alternative (pp. 221-223), nor will there be any effects to any threatened or endangered species that were not considered in the BO (Appendix C, pp. 35-36).

As stated in the document p. 205, it has been concluded that there cannot be an effect of nest parasitism by cowbirds on interior forest songbirds (deCalesta, 1998). This is based on conclusions from 8000 birds recorded during census and only 15 cowbirds were noted.

Landscape patterns were also used in the East Side project to analyze the affects of fragmentation. See p. 202, Landscape Patterns.

Comment 9-11

The analysis needs to consider Desrochers, Andre, & Susan J. Hannon "Gap Crossing Decisions by Forest Songbirds during the Post-Fledging Period" Conservation Biology, Vol II, No. 5 October 1997, pp 19,04.1210.

Comment noted.

Comment 9-12

The issue of the impacts to herbaceous understory needs to be addressed. Research indicates herbaceous understories never recover from logging. (Duffy, David and Albert J. Meier, "Do Appalachian Herbaceous Understories Ever Recover from Clearcutting?" Conservation Biology Vol. 6 No. 2 June 1992

The article you referenced summarizes observations from contrasting second growth forest herbaceous plant vegetation 45 to 87 years after clearcutting with that occurring in old growth forests in the Southern Appalachians. It concludes that the herbaceous plant communities found in old growth stands may not recover within 40 to 150 years of such harvest activity, suggesting a future loss of diversity of understory herbaceous plants.

Impacts to herbaceous understory plants are discussed in the FEIS (pp. 144-146, 164, 177-179, 185, 187, 202, 210, 228-229, and Appendix C pp. 13-14. Harvesting, reforestation, and other management practices (as is also the case with natural disturbances) do affect shrubs and herbaceous plants. Deer browsing has and will continue to substantially impact these species as well. All of the stands proposed for treatment were clearcut in the early 1900's (FEIS pp. 130-131 and Appendix B, p. 10), selective deer browsing since then has substantially impacted herbaceous plant development (FEIS p. 132 and Appendix B, p 13), and there are no threatened, endangered, or sensitive plant species present (FEIS Appendix C p. 13-14) on the sites proposed for treatment. As expected, the current herbaceous plant composition of the sites proposed for treatment differs substantially from that which existed during the pre-settlement era (for the reasons discussed above). While we expect herbaceous plant composition of areas proposed for final harvest to differ from current conditions once final harvest is complete, we expect no overall loss of herbaceous plant species diversity. Few species are restricted to or absent from any stage of stand development, but they do differ in their abundance between stages.

In a pilot study conducted on the Allegheny National Forest, investigators looked at a chronosequence ranging in age from a five year old stand through to an old-growth virgin forest. They found species richness to be greater in managed second-growth than in true old-growth forests in this region. The dense understory of American beech and lack of variety in micro-site conditions associated with old-growth of this region is likely the reason for this difference. Management creates variety in micro-site conditions which in turn allows for recruitment of a broader variety of species. (Ristau, personal communication) We anticipate the forest floor would actually have a greater abundance of various herbaceous plants than the current condition for alternatives which provide for greater control of interfering plants (FEIS, p. 177-178, 185) and which provide measures to reduce deer browsing impacts.

Comment 9-13

The analysis needs to consider the degree to which the alternatives would impede the movement and dispersal of closed-canopy forest wildlife species between stands and larger regions. The analysis should present and quantify the degree of fragmentation within the project area that has already taken place and those that will occur as a result of the various alternatives. These patterns need to be compared to the historical patterns that existed prior to human disturbance.

See Comment 9-10.

Comment 9-14

Analysis needs to be conducted and presented to show the range of potential impacts for the following variables:

*total amount and distribution of late-successional and mature forest habitat.
*total amount and distribution of important wildlife habitats now uncommon due to past human activity (e.g., riparian forests, native grasslands, etc.).
*total amount and percentage of forest habitat compromised by edge effects.
*Size distribution of habitat patches by seral stage and forest type.

The direct/indirect and cumulative effects on all habitat types can be found on pp. 218-223. In addition, landscape patterns were used to analyze the affects of fragmentation in relation to size and distribution of patches.

Comment 9-15

Analysis needs to be conducted and presented to show the range of potential impacts for the following variables:

*forest patch perimeter to edge ratios.

The edge to interior forest ratio for this project area was not calculated. The best and most recent scientific information available for measuring the affects of fragmentation suggests that there is no single measure that captures all aspects of fragmentation. It is recommended that the aspects selected to analyze fragmentation are those that are of most concern to the question of interest. The aspects that are of most concern for the East Side project are; connectivity of communities, retention of large forested patches, and preventing patch isolation.

The project area is 139,990 acres, of this approximately 2% is proposed for overstory removal, thus retaining a large percentage of mature forest (see Table 51). Given the minimal amount of temporary edge that will be created, the interior to edge number would be diluted within each sub-watershed and more so across the project area.

Landscape patterns were also used in the East Side project to analyze the affects of fragmentation.

Comment 9-16

Analysis needs to be conducted and presented to show the range of potential impacts for the following variables:

*amount and distribution of roadless area within and adjacent to the planning area.

As defined within the RARE II Roadless analysis, there are no areas within or adjacent to the Eastside Project Area that meet the definition of roadless. Therefore, no analysis was necessary.

Comment 9-17

Analysis needs to be conducted and presented to show the range of potential impacts for the following variables:

*degree of connectivity between both individual forest stands and larger habitat blocks.
*degree of structural contrast between habitat patches.
*population viability analysis for species or feeding guilds most prone to fragmentation effects (e.g., area sensitive mammals, forest-dwelling songbirds).

See Landscape Patterns, p. 202 of the East Side EIS. Analysis was completed using both course filter and fine filter strategies, p. 187. The management indicator species approach addresses guilds associated with specific vegetation types and ages, pp. 191-201, and the Biological Assessment analyzes the affects to species that are more sensitive to habitat change and/or have specific habitat needs, Appendix C. Fragmentation is addressed on p. 205 and 221-223.

Comment 9-18

Existing conditions regarding these variables must be considered within the historical ranges of natural variability (i.e., what was likely there before large-scale human alteration of the landscape).

The scale used to complete the analysis of this EIS is commensurate with the risks associated with the project, the species involved, the likelihood of species occurrence and the level of knowledge already at hand. In addition, the Forest Plan considers historical influences and established objectives based on this information.

Comment 9-19

The analysis must define and measure biodiversity both in terms of the existing condition and the condition that would result if each of the alternatives is implemented. The analysis must consider the vulnerability, reduction from historical abundance, and the regional importance of all species in the project area. The analysis must use the pre-settlement condition of the project area as a benchmark for comparison with the existing condition and proposed changes to the project area. The analysis must consider the functional, structural, and compositional attributes of biodiversity. The analysis needs to evaluate the existing condition of biodiversity, and compare it with the natural range of variability.

The analysis does consider the functional, structural and compositional attributes of existing ecological systems, (p. 187) over time in order to sustain biodiversity. Affects on resources in the project area are discussed under Direct, Indirect and Cumulative effects sections. The historical time scale considered is commensurate with the proposed activities.

Comment 9-20

The Project Area needs to be considered within a landscape context. The analysis needs to consider the importance of maintaining connectivity between both individual and larger habitat blocks. To adequately consider the impacts of the project on biodiversity at the landscape scale, the following analysis must be conducted for all of the alternatives:

*size distribution of habitat patches for all community types and forest seral stages

*patch size diversity index.

*degree of connectivity maintained between habitat patches at various scales, particularly between those patches that are now uncommon in the landscape (e.g., late successional forests, roadless areas).

*vegetation mosaic patterns.

*cumulative effects at scale of watershed and regional ecosystem.

*comparison of landscape patterns created by development to those created by natural disturbance regimes for all the above variables.

*Maintenance of uncommon' or unique landscape elements (e.g., rare plant communities, natural ecotones, undistributed vegetation along environmental gradients, etc.).

Comment noted. The occurrence and distribution of community types is discussed under Landscape Patterns, p. 202 and Fragmentation, p. 221. The identification of Unique Plant communities and effects are displayed on p. 202.

Comment 9-21

Existing conditions regarding these variables need to be considered within the context of their historical ranges of natural variability (i.e., what was there before large-scale human alteration of the landscape?).

Comment noted. The historical scale used to analyze the effects on these variables and all resources is commensurate with the level of activities proposed in the East Side project, with the objective of sustaining the ecosystems being considered.

Comment 9-22

The analysis needs to consider the cumulative and site specific effects of logging on biodiversity. The analysis must consider impacts on the following levels of diversity: 1) regional landscape, 2) community-ecosystem, 3) population-species, and 4) genetic. The analysis area must be large enough to consider biodiversity on all these levels.

The regional landscape analysis needs to: 1) Identify the distribution, richness, and portions of patch (habitat) types and multipatch landscape types; 2) Consider the collective patterns of species distributions (richness, endemism); 3) Consider heterogeneity, connectivity, spatial linage, patchiness, porosity, contrast, grain size, fragmentation, juxtaposition, patch size frequency distribution, perimeter area ratios, and the pattern of habitat layer distribution; and 4) Consider the disturbance processes (areal extent, frequency, or return interval,

Comment 9-22 cont.

rotation period, predictability, intensity, severity, and seasonality), nutrient cycling rates, energy flow rates, rates of erosion and geomorphic and hydrologic processes, and human land-use trends.

The community-ecosystern analysis needs to: 1) Identify relative abundance, frequency, richness, evenness, and diversity of species and guilds; 2) Identify proportions of endemic, exotic, threatened, and endangered species; 3) Identify dominance-diversity curves, lifeform proportions, similarity coefficients, and C4:C3 plant species ratios. 4) Consider the substrate and soil variables, slope and aspect, vegetation biomass and physiognomy, foliage density and layering, horizontal patchiness, canopy openness and gap portions, abundance, density, density and distribution of key physical features (e.g., cliffs, sinkholes, and outcrops) and structural elements (snags and down logs), water and resources (mast) availability, and snow cover. 5) Consider the biomass and resource productivity, herbivory, parasitism, and predation rates, colonization and local extinction rates, patch dynamics (fine scale disturbance processes), nutrient cycling rates, and human intrusion rates.

The population-species analysis needs to: 1) Identify absolute or relative abundance, frequency, importance or cover value, biomass, and density. 9) Consider dispersion (micro-distribution), range (macro-distribution), population structure (sex and age ratio) habitat variables, and within-individual morphological variability. 3) Consider the demographic process (fertility, recruitment rate, survivorship, morality), metapopulation dynamics, population genetics, population fluctuations, physiology, growth rate (of individuals), acclimation, and adaptation.

The genetic analysis needs to: 1) Identify allelic diversity and presence of rare alleles, deleterious recessive, or karyotpic variants. 2) Consider the effective population size, heterozygosity, chromosomal or phenotypic polymorphism, generation overlap, and heritability. 3) Consider inbreeding depression, outbreeding rate, rate of genetic drift, gene flow, mutation rate, and selection intensity.

Comment noted. See the Method of Analysis section of Chapter 3, pp. 187-193.

Comment 9-23

For all state and Federal threatened and endangered (including candidate species), sensitive species, species of concern, and rare species the analysis needs to: 1) Describe the desired future condition (habitat quality, quantity, and configuration needed to support the desired population levels), 2) Disclose any known or suspected limiting factors, 3) Define suitable habitat and the status of the habitat ion the project area for the species, and 4) List management recommendations which would remove or mitigate any adverse effects.

See Appendix C, Biological Assessment.

Comment 9-24

All old growth opportunities should be evaluated independently of potential timber stands. Opportunities must be based on both landscape and structural characteristics. Any stand that meets either or both characteristics should be designated old growth. Riparian areas deserve priority for inclusion in old growth designations for watershed protection and wildlife benefits.

Old Growth opportunities are evaluated at the community level and at the landscape level (p. 202). Also, see pp. 190 and 212. Riparian areas are protected by standards and guidelines and mitigation measures (see Appendix D) and do not necessarily need to occur as inclusions in Old Growth to provide wildlife benefits. Please response to Comment 129-77.

Comment9-25

An alternative to manage this area for forest interior species (by changing its management prescription if needed) must be considered. Projects that reduce the fragmentation of the area should be considered.

Five alternatives are being analyzed for the East Side project area and the affects of these alternatives on all management indicator species can be found on pp. 218-220.

Comment 9-26

The analysis needs to address the predation impact of logging. The analysis needs to consider the impact of increased populations of nest predators such as bluejays, raccoons, and black snakes. The analysis needs to also consider the impact of logging roads (both providing feeding areas and a source of calcium for cowbirds) on forest interior species.

Fragmentation and edge affects were analyzed to the extent that research has shown these issues to increase predation. The level of analysis is commensurate with the level of activities being proposed, p. 205.

Comment 9-27

The analysis must cumulatively consider whether interior species can escape extinction if the project area is not protected. The issue of how forest interior species such as the woodthrush can maintain a Minimum Viable Population without protecting this area needs to be addressed.

Cumulative affects on all habitats for all management indicator species is displayed on pp. 223-227.

Comment 9-28

The results of the USFWS suggests that forest management practices that promote the conservation of insectivorous birds are imperative to maintain forest productivity. Such management practices would emphasizes strategies that maximize bird species diversity and the viability of their populations."

Marquis, Robert J. and Christopher J. Whelan, "Insectivorous Birds Increase Growth of White Oak Through Consumption of Leaf-Chewing Insects" Ecology, 75(7), 1994, pp. 2007-2014.

Comment noted. Sustaining viable populations of all wildlife species is considered during project analysis.

Comment 9-29

The issue of the impacts of roads needs to be addressed. The analysis needs to address the impacts of increased mortality due to road kills. The analysis needs to address the impacts from fragmentation and isolation of species with an aversion to roads.

Fragmentation and isolation are discussed on pp. 221-223. Increased mortality due to road kills has not been presented as an issue. (assumption made that commenter is referring to forest service roads). Very few, if any, deer road kills occur on Forest Service roads (personal comm., WCO Richard Bodenhorn).

Comment 9-30

The issue of the effects the project will have on other stands in times with high wind needs to be addressed. The analysis needs to address if the openings will funnel the wind to other trees that will result in blowdown. By the same token, the analysis needs to address if the trees left standing can survive high winds.

We have added further discussion of the historical impacts of wind on trees and of the future blowdown potential from the management prescribed in the various Eastside alternatives (FEIS p. 130). In summary, though some blowdown will occur in stands adjacent to those where final harvest occurs. Past experience indicates that overall it will not differ appreciably from that observed if no final harvest were to occur. From past experience, we also expect a large majority of the residual standing trees in harvest areas to be able to withstand non-catastrophic winds.

Comment 9-31

IMPACTS ON PLANTS & ANIMALS IN THE SALE AREA-

The Forest Service misrepresents its project by using sanitized language, such as "harvest," to describe the proposed action. The reality of a timber sale is that the Forest Service kills thousands of creatures and many of these creatures suffer long and agonizing deaths.

Comment noted. Please see the Wildlife section of Chapter 3 and the BA for discussions of the effects of proposed activities on wildlife resources.

Comment 9-32

The analysis needs to disclose the true impact of the Forest Service converting our natural heritage into devastated stumpland. The Forest Service always claims that early successional species require the devastation of Forest Service timber sales. The Forest Service, however, neither provides any proof nor evidence of this claimed need or addresses the impacts to the species currently living in the area.

The analysis needs to disclose the impacts to the plants and animals currently living in the project area. For example, scientists estimate the Forest Service kills 250 million songbirds a year, many of whose population is declining. Most killed are defenseless nestlings. The Forest Service kills many other species when it cuts the sale. The analysis needs to estimate the number of each different species that will be killed when the sale is cut. The population trend of each species that will be killed needs to be disclosed. For species with a downward population trend, the analysis needs to disclose how killing all these creates will impact the trend. Population trends must be calculated from site-specific inventory and monitoring data, not computer models.

The analysis also needs to disclose what kind of death these defenseless creatures will suffer. Will they be instantly killed when the trees are cut or when they are ran over by logging equipment? Or will they suffer a slow

Comment 9-32 cont.

and agonizing death from starvation, exposure, or dehydration? The analysis also needs to estimate how long the creatures will suffer before they die.

The Forest Service needs to develop alternatives and mitigation measures to minimize the death and suffering the logging causes. For example, the alternative/mitigation measure of not cutting in the nesting season needs to be developed and considered.

The analysis also needs to disclose the indirect impacts to the species that are not directly killed by the trees being cut down or run over by logging equipment. The analysis needs to disclose how many additional plants and animals will be die because of the major and sudden modification to their habitat. The analysis needs to disclose what kind of death these creatures will suffer. Will it be a quick and painless death? Or will the creatures suffer a long and agonizing death from starvation, dehydration, or exposure. The analysis needs to disclose how long these creatures will suffer before they die. The Forest Service needs to develop mitigation measures/alternatives to minimize the deaths and suffering. If the Forest Service claims that some of these species will just go some place else, the Forest Service needs to provide proof of this. For example, the Forest Service would need to provide site-specific data showing other areas are not already occupied by other members of the species. The analysis needs to address the humane and anti-cruelty laws. The analysis needs to disclose each law and indicate whether it would apply to a timber sale. (Please discuss both the Forest Service's and loggers compliance with the law.) Even if the Forest Service claims the laws do not apply to their logging, please disclose if all the animals in the sale area are being treated in the manner that would be considered humane under the laws. In the Response to Comments, please explain why you believe killing and causing pain and suffering to forest creatures is justified so that you can get the cut out.

Comment noted. Please see the Wildlife section of Chapter 3 and the BA for discussions of the effects of proposed activities on wildlife resources.

Comment 9-33

MIGRATORY BIRD TREATY ACT-

While the USFWS says it is not a criminal violation of the MBTA for the Forest Service to approve a timber sale, the USFWS says it is a crime for the loggers to kill birds. For example, the USFWS has stated: Federal Agencies are required to ensure that their decisions comply with the Migratory Bird Treaty Act (MBTA) (16 U.S. C. 703-712; Ch. 128; July 13, 1918; 40 Stat 755, as amended). The MBTA prohibits the take of migratory birds, nests, eggs and nestlings. The Federal list of migratory birds (50CRF10 April 15, 1985) includes nearly every native bird species found in the State of Idaho, including Northern flicker. The DEIS does not accurately represent MBTA requirements. The FEIS should reflect the analysis below.

The DEIS states: "Trees with unidentified but occupied nest may be felled during logging or thinning activities, destroying the nests.... The proposed management activities comply with the MBTA." The MBTA prohibits the direct take of migratory birds, nestlings and eggs by persons. Actions undertaken by contractors of the Forest Service that include cutting occupied trees, resulting in the death of migratory birds, nestlings or eggs, are not in compliance with the MBTA. However, federal agencies are not considered "persons" under the MBTA, and federal employees are not liable for taking migratory birds while performing their official duties for federal actions within the authority of the federal agency. For instance, prescribed burn actions implemented by Forest personnel are in compliance with the MBTA, even if such actions result in the take of migratory birds, nestlings or eggs. In this case, however, contractors felling trees with nestlings or eggs would result in take of migratory birds, and persons that cut such trees are liable under the MBTA. If actions were done in the winter, or other times when nests are not occupied by nestlings or eggs, the action would be in compliance with the MBTA, because the MBTA addresses only direct take, but does not address habitat loss. The Service recommends the FEIS include project design, timing and implementation requirements to protect migratory birds and their habitats, and correctly describe liability associated with the take of birds, nestlings and eggs. USFWS comments on the proposed Deadwood timber sale on the Boise NF. The analysis needs to address this and develop mitigation measures to assure the loggers will not violate the MBTA.

The East Side project is in compliance with all laws and regulations.

Comment 9-34

BASELINE DATA-

Before carrying out the project, the Forest Service needs to obtain baseline data for all MIS species, forest interior birds, and reptiles and amphibians. This needs to be done with field surveys. See Sierra Club v. Glickman, 974 F.Supp. 905 (E.D.Tex. 1997). Survey methodologies must be disclosed. An adequate monitoring plan also needs to be in place. The Forest Service needs to conduct plant and animal surveys in all seasons.

The need for project level field reconnaissance is commensurate with the risks associated with the project, the species involved, the likelihood of species occurrence and the level of knowledge already at hand. Through its Forest-wide wildlife monitoring efforts (wetland plant surveys, breeding

Comment 9-34 cont.

bird transects, etc.), as well as project level surveys (FEIS Appendix C, pp. C-5-C-6 and C-11-C-19), the ANF has been collecting data on a wide variety of wildlife, including threatened, endangered and sensitive plant and animal species. As a result, sufficient survey data has been conducted to adequately assess wildlife diversity within the East Side project area.

Comment 9-35

The analysis needs to disclose all the site-specific data that is being used for this project. For all the data, the analysis should reveal when it was gathered, who gathered it (including their qualifications) and the methodologies used. We have been on many Forest Service tours of proposed timber sales when the Forest Service could not find the site. Thus, we are concerned that the people who gathered the data for the project area may have been in the wrong place and not known it. The analysis needs to disclose the technology used to determine the location when the site-specific data was gathered and provide proof that the data is for the correct area.

Comment noted. Site specific data is incorporated into the Project file and is physically available at the Marienville Ranger Station.

Comment 9-36

The population trends of threatened, endangered, sensitive species, and MIS needs to be disclosed for the Ranger District, Forest and Region. The trends of threats to these species in each Ranger District, Forest and Region needs to be disclosed.

Comment noted. Site-specific data is available in the project file.

Comment 9-37

The analysis needs to disclose and consider all the monitoring data that has been conducted in the project area. If there has been no monitoring done in the project area, the Forest Service should not be proposing any projects until it obtains monitoring data for the area. If there is no monitoring data for the area, the analysis needs to explain why the NFMA and NEPA's monitoring requirements are not being followed. Computer model projections cannot replace field monitoring and surveys.

Comment noted. See response to Comment 9-34.

Comment 9-38

PHYSICAL ENVIRONMENT-

The issue of carbon holding capacity needs to be addressed. An older forest holds more carbon than a young forest. (Mark E,, William K. Ferrell, Jerry F. Franklin, "Effects on Carbon Storage of Conversion of Old-Growth Forests to Young Forests." Science, Vol. 9,17, 9 February 1990, pp. 699?70.) The issue of the impact of increased nitrates needs to be addressed. As forests are forced to absorb ever higher levels of nitrates from the atmosphere, their systems become saturated. When forest disturbances occur (fires, logging, etc.) these nitrate levels are released into streams and into the air as gaseous nitrates. High levels of nitrates in the soil can lead to cation loss, acidification, with obvious long-term forest health implications.

See FEIS p. 63 regarding this topic. When considering the carbon consequences of forest management alternatives, there is an important distinction which must be made. Carbon storage refers to a "snapshot" view of how much carbon is stored in the forest now, while carbon sequestration is more of a process view. For any given management alternative, short-and long-term results will often be quite different. The most useful way to compare alternatives is to employ the concept of average annual yield. While an old forest generally contains more carbon than a young forest, the older forest's rate of carbon storage will most likely either be very low, zero, or perhaps even negative. Younger, rapidly growing forests, while actually containing less carbon, are actually removing carbon and storing it at a faster rate than an older forest. The best carbon storage strategy provides a mix of older stands with large carbon storage (but low net sequestration) and younger stands which are rapidly accumulating carbon.

The article by Harmon et al. (1990) makes some valid points, but several issues need to be addressed. Their accounting method considers that harvested material landfilled or burned for fuel is lost to the atmosphere; however, other accounting systems generally regard such carbon as sequestered. Decomposition is slow in landfills, and carbon burned as fuel is generally replaced by regrowing trees; in addition, the burning of biomass carbon prevents the burning of fossil fuels, which are not only more carbon dense but also are not replaced. While carbon accounting is still a

Comment 9-38 cont.

subject of international negotiation, the methods used by Birdsey (1996) are those relied upon to produce the United States national forest carbon budget used by the government, and so should be considered to be more appropriate than the methods of Harmon et al.

In addition, the outcome from the simulations performed by Harmon et al. (1990) should not be extrapolated to all forests. Management simulations based on actual inventory data from the Southeastern United States (Hoover et al. 2000) indicate that the carbon consequences of forest management actions depend strongly on initial forest conditions, especially age class distribution, forest composition, and stocking level. In general, a mixture of older trees with high current carbon storage and younger trees with rapid carbon accumulation rates will provide the best opportunities for maximizing the carbon storage potential of a forest. It is also desirable to maintain stands in a well-stocked state and ensure successful regeneration, so that the carbon storage potential of a site is fully realized.

Comment 9-39

The issue of the impacts to soil and water quality needs to be addressed. The effects of soil compaction and vegetation/nutrient removal must be considered. The analysis needs to address the impacts of decreased water quality due to increasing rates of soil erosion and mass wasting events. The effects of sedimentation, nutrient removal, and increased temperatures resulting from logging must be considered. The analysis needs to address the cumulative impacts on aquatic communities, including fisheries.

See the Direct/Indirect and Cumulative Effects discussions of the Ecological Landtypes and Water and Watersheds sections of Chapter 3.

Comment 9-40

Some of the factors which need to be considered in the analysis of the cumulative effects include: 1) coarse particulates organic matter, 2) fine particulate matter, 3) algal abundance, 4) temperature extremes, 5) turbidity, 6) diurnal cycle of dissolved oxygen, 7) nutrient input into the stream, 8) amount of suspended solids, 9) stability of substrate and banks, 10) uniformity of water depth, 11) habitat heterogeneity, 12) flow extremes, 13) diversity of microhabitat velocities, 11) primary and secondary production, 15) abundance of shredders versus scrapers, 16) abundance of omnivores verses piscivores.

The comment is outside the scope of the document.

Comment 9-41

The analysis needs to identify all site-specific "Best Management Practices" for controlling non-point source pollution. The analysis needs to identify and consider any water quality monitoring done to demonstrate the adequacy of the Best Management Practices.

Refer to the Mitigation Table in Appendix D for site-specific BMP's. Also, see the Mitigation Measures under Water and Watersheds for a discussion of limestone surfacing study that was completed on the ANF

Comment 9-42

The issue of all cumulative threats to water quality, including logging, illegal dumping, oil and gas leasing, wildlife openings upstream of the project area must be addressed. The analysis needs to identify all these threats. The analysis needs to identify and protect all riparian areas, wetlands, and floodplains.

The FP has Standards and Guidelines to accomplish the protection of riparian areas, wetlands, and floodplains during various land-disturbing activities. These are incorporated into the site-specific mitigation measures in Appendix D.

Comment 9-43

The issue of the nutritional value of the plants growing in the resulting openings needs to be addressed. Research in the Pacific Northwest and Alaska indicates that the nutritional value of plants in open areas, such as a clear-cuts, is significantly less than in a forest. Preliminary results from research being conducted on the Daniel Boone National Forest in Kentucky show the same thing for all forms of logging.

Comment noted. Although your comment did not specify what type of nutritional value of plants you are referring to, as forage or as soil nutrient recycling, the analysis considers the decrease of organic materials due to timber harvest. See nutrient recycling, Chapter 3, p. 63.

Comment 9-44

CAVES, SPRINGS, & GROUNDWATER-

Timber sales increase water flow and sediment. Caves andsprings many miles away can be adversely affected by logging 20 or more miles away and in different watersheds. For example, a timber sale could result in increased water entering a cave and in a major storm event, the increased water could result in a flood large enough to kill (i.e., drown) or harm creatures in the cave. Or it could kill someone exploring the cave. It could also adversely affect or kill creatures living in a cave or a spring by changing the temperature or increasing sediment. Thus, the analysis of effects must also consider groundwater and subsurface water flow.

Because of the soil surface texture the ANF has very little across-the-surface water flow. Water enters the soil and percolates to a restrictive layer or bedrock then generally flows across these layers until it can enter the ground water, a stream and/or a seep/spring. On non-harvested stands surface flow does start when the slope is over 60%. Wheeled and/or tracked vehicle harvesting does not occur on slopes over 40%. Harvesting of timber has no impact on seeps if they are not crossed by skidders or not bisected by roads. The type of geology (generally sandstone) on the ANF produces very few caves as compared to limestone geology.

Comment 9-45

ROADS-

The analysis needs to determine if there are any roads in the project area that are not included in the Forest Transportation Plan inventory. If any roads are not in the inventory, they need to be permanently closed to the motorized travel by using permanent physical obstructions and by ripping, recontouring, and revegetating the road bed and prism. The Forest Service needs to determine if the number of open roads in the project area exceeds Forest Plan standards. If the standards are exceeded, the roads need to be permanently closed. If any road in the project area is already subject to a closure order, a site inspection needs to be conducted to determine if motorized use of the road is occurring. If such use is occurring, the Forest Service needs to block the traffic with physical barriers and ripping, recontouring, and revegetating the road. Law enforcement must be employed to ensure appropriate compliance.

During project development, a survey of the project area is completed to find any roads that exist and determine the condition and need for all existing roads. Those that are needed for resource management, now or in the future, are added to the system, while those that are not needed for resource management are recommended for decommissioning (see Table 36). Table 38 indicates the current and projected road density by alternative. In all alternatives, the road density does not approach the limits in the standards and guidelines. The road management guidelines shown in the plan are for 50 years. i.e., attainment of 20% open, 20% restricted, and 60% closed may take until 2035 to achieve. As shown in Table 39, the Forest is moving toward that goal. Law enforcement is used to ensure compliance with road closures.

Comment 9-46

The analysis needs to disclose the conditions and weight limits of all the roads and bridges that will be used to haul trees to the main roads. The analysis needs to disclose if any of these roads or bridges will need to be upgraded or repaired in order to carry out this project. The analysis also needs to disclose the amount of damage the logging trucks will do to existing roads and bridges, and the cumulative direct and indirect effects the transportation of logs will have on local residents and landowners.

Table 36 indicates any roads that require construction, reconstruction – betterment, or reconstruction – restoration in order to implement this project. There are no bridges that require work to implement this project. Implementation of this project, with the associated roadwork, will result in a transportation system that is improved over the current condition. See the Direct Effects discussion of the Transportation section of Chapter 3.

Comment 9-47

INVERTEBRATES & MICRO ORGANISMS-

The issue of impacts to the microorganisms such as fungi and bacteria in the soil needs to be addressed. Logging will kill off many of these. An inventory of these organisms needs to be done so the impacts could be determined. The impacts of compaction, vegetation removal and erosion must be considered.

The prescription for all land management activities is to keep surface disturbance to the minimum when completing prescribed treatments. Some loss of invertebrates, fungi, and microorganisms may occur on 15% of the harvest area due to surface disturbance and compaction. Forest Plan standards and guidelines and mitigation measures will insure that 85% of the area within treatment units is relatively undisturbed.

Comment 9-48

DEAD & DECAYING WOOD-

Forest Service research indicates dead and decaying wood accounts for about 25% of a forest's biodiversity. (Maser, Chris, James M. Trappe "The Seen and Unseen World of the Fallen Tree." General Technical Report PNW-164.) The impacts of removing trees on this component of the forest ecosystem needs to be considered. The Forest Service generally contends that trees are somehow wasted when they die. If the trees die, they need to be allowed to fulfill their function and be recycled back into the ecosystem. The no-action alternative needs to consider these values. According to the Forest Service: "Wildlife and fish need dead, hollow or fallen trees for food and family homes. Nationwide over 149 species of birds, 73 species of mammals, 93 species of amphibians and reptiles and nearly all fish use (dead trees) for food, nesting, or shelter. Only 31 bird species can make their own nest cavities in trees. Another 54 species of birds and other animals also use these holes. Loose bark on dead trees provides roosting colony sites for bats. Up to 167 pygmy nut-hatches have been known to roost simultaneously in a tree hole. Many species of turtles bask on fallen trees in or near water. Rhythmic drumming on dead trees is a ritual woodpeckers use to attract a mate. Ants living in dead wood eat thousands of forest insect pests which can harm living trees. Bass and trout hide under trees that have fallen into the water. The forest neighborhood continually changes and yet the way animals, plants, and people depend on each other remains the same, Even as a tree dies, it continues to give life to animal families and eventually to new trees and other plants, and the cycle begins again." US GPO 1990-0-792-461 The analysis needs to disclose how many standing and fallen dead trees would there be in a healthy natural forest of this size and the current status of this habitat component. The analysis needs to disclose the effects of the proposal on this important habitat.

Coarse woody debris is discussed on p. 191 of the wildlife section and p. 63 of nutrient recycling, vegetation section. In addition, all snags are reserved in green final harvest units and 5-10 snags per acre, >9 inches in diameter, in salvage units. All riparian areas are protected by buffers.

Comment 9-49

FISH & WILDLIFE-

Reptile and amphibian populations have been dropping dramatically throughout the world. The effects to these species needs to be evaluated. Baseline data needs to be gathered for the entire project area. A monitoring plan needs to be developed. Research indicates logging devastates salamander populations. (Petranka, James W., Matthew E. Eldridge, and Katherine E. Haley, "Effects of Timber Harvesting on Southern Appalachian Salamanders." Conservation Biology; Laura A. Herbeck, Larsen, David R. "Plethodontid salamander response to silvicultural practices in Missouri Ozark forests" Conservation Biology June 1999; Man Tech Environmental Research Services Corp.,Corvallis, OR, "An Ecosystem Approach to Salmonid Conservation" www.pond.net/~kris/Mantec.htm, Recovery of Wild Salmonids in Western Oregon Forests: Oregon Forest Practices Act Rules and the Measures in the Oregon Plan for Salmon and Watersheds Technical Report 19991 Independent Multidisciplinary Science Team (Can be downloaded at www.forestscience.org/).) This research needs to be considered.

Comment noted. The Forest Service research biologists have been collecting data on small mammals, amphibians and reptiles. Some of this information is displayed under the coarse woody debris section, p. 191 of the wildlife section.

Comment 9-50

The analysis needs to address the status of native fisheries & mussels land stream habitat quality compared with historic conditions in the project er adopting opinion 116 F.3d 1+82 (C.A. 7 (111) 1997).

Under the Watershed Description section, fisheries and aquatic habitat are summarized for each watershed. More specific information on the number of species of fish can be found in the various stream surveys that are referenced.

Comment 9-51

The Court ruled that the Forest Service was required to analyze the impacts of the ATV/ORVs violating the law by going off the trails.

This comment is beyond the scope of the East Side project.

Comment 9-52

Similarly, the Forest Service needs to analyze the effects of timber theft.

This comment is beyond the scope of the East Side project.

Comment 9-53

NEED FOR THE SALE-

The issue of the need to cut timber from the sale area to meet society's needs for timber must be addressed. The alternative of private lands providing the timber needs to be considered. The issue of the impacts of local landowners having to compete with below-cost government timber needs to be considered. In a hearing for Kentucky Heartwood v. United States Forest Service, Civil # 97-378 (E. D. KY, April 15, 1998), the timber industry put on witnesses who testified that the price of timber on private land had increased due to the reduction in logging on the Daniel Boone National Forest. The indirect effect of the unfair government competition triggering poor private forest management needs to be analyzed. The state's private forests can easily provide all of our timber needs. On a state and regional basis, the National Forest contributes an insignificant portion of the timber production. The best use of the area needs to be considered. The primary use of hardwoods from the Forest is pallets. The pallets are used only once and usually end up in a landfill. Pallets can be made from recycled plastic. There is a company in Missouri that makes pallets that can be reused 15-20 times. The analysis needs to compare the relative value of this area as a tree farm to make pallets that clog our landfills to wildlife habitat and recreation land. Such an analysis is needed to address the issue of what is the best use of this area. The Forest Service needs to consider and implement its "National Strategy for Waste Prevention and Recycling." The analysis needs to consider how this timber sale will promote waste of wood and fiber. The Forest Service cannot bury its head in the sand and say this is beyond the scope of the analysis. The Forest Service has a legal responsibility to provide leadership to waste reduction efforts. Ignoring the impacts of providing cheap, particularly below-cost, trees on reduction efforts is not providing leadership. The indirect effects of filling up landfills with pallets, wood products, and paper (which are acknowledged in the National Strategy for Waste Prevention and Recycling) must be considered. An alternative of using reusable pallets or pallets made fromrecycled plastic needs to be considered. This alternative would respond to the issue of whether there is a need to cut this area and what the best use of the area is. An alternative of increasing the use of recycled paper also must be considered for the same reasons. The NFMA states: "recycled timber product materials are as much a part of our renewable forest resources as are the trees from which they originally came, and in order to extend our timber and timber fiber resources and reduce pressures for timber production from Federal lands, the Forest Service should expand its research in the use of recycled and waste timber product materials, develop techniques for the substitution of these secondary materials for primary materials, and promote and encourage the use of recycled timber product materials." (16 USC § 1600) The Forest Service should follow its mandate to provide a leadership role in waste reduction by printing all documents on both sides and using either alternative fiber or 100% post-consumer recycled paper. The issue of exports needs to be considered. Trees cut down east of the Mississippi can be exported to foreign countries. An alternative of banning exports needs to be considered.

This comment is beyond the scope of the East Side project.

Comment 9-54

RECREATION-According to the Explanatory Notes for the 1997 Forest Service Budget: 1) In FY 1994 the Forest Service hosted over 835 million visits on National Forests, compared to 300 million by the National Park Service and 40 million by Disney; 2) Recreational use of the forests is at an all time high, and RPA projections indicate that use will increase over 50 percent by 2040; 3) Over 2_ million jobs are associated with the economic activity generated by recreation which is estimated to almost $100 billion annually; and 4) Recreation fees to the Treasury were $46 million last year. The timber program, by comparison, created 76 thousand jobs worth $2.7 billion (National Summary Timber Sale Program Annual Report Fiscal Year 1994.) and cost the treasury $978 million in 1994. (Forest Service Distribution of Timber Sale Receipts Fiscal Years 1992-94, General Accounting Office Report #GAO/RCED-95-237FS, September 1995.).

This comment is beyond the scope of the East Side project.

Comment 9-55

A survey in the September 1996 issue of Conde Nast Traveler magazine readers says that the environment has become a "major issue" for many travelers. More than half of the respondents (218 readers responded) said that the environment has become a factor in their travel plans over the last ten years. Ninety-one percent expressed concerns over environmental conditions at their destinations, and 25% said they had been forced to change travel plans because of environmental problems. Almost 42% said they would have changed plans had they known in advance about problems they encountered. The analysis needs to consider this survey.

Comment noted. See the Recreation section of Chapter 3.

Comment 9-56

The issue of impacts on recreation needs to be considered.

See the Recreation section of Chapter 3.

Comment 9-57

The Forest Service should consider how the project, including the cumulative impact of other logging operations, will to pay the Deciding Officer's and other Forest Service employee's salaries and other administrative overhead. The no-action alternative needs to disclose its impact on Forest Service employment levels.

This comment is beyond the scope of the East Side project.

Comment 9-58

ECONOMIC IMPACTS-

The Forest Service needs to addresses all the economic trade-offs and all the environmental externalities from the timber sale. The Forest Service needs to conduct an analysis that addresses the points of the Forest Service publication: "Assessing Economic Tradeoffs in Forest Management" PNW-GTR-403, August 1997. The Sky Did NOT Fall-The Pacific Northwest's Response to Logging Reductions by Ernie Niemi, Ed Whitelaw, and Andrew Johnston which can be downloaded at www.pacrivers.org/Publications/skyfkUing.htnil needs to be considered.

See Comment 129-81.

Comment 9-59

Even-Aged Management-

The Forest Service needs to fully develop and consider uneven-aged management alternatives. The 6th Circuit has ruled:The National Forest Management Act mandates that the Service ensure that even-aged management practices be used in the national forests only when "consistent with the protection of soil, watershed, fish wildlife, recreation, and aesthetic resources, and the regeneration of timber resources." 16 U.S.C. § 1604(g)(F)(v). The National Forest Management Act thus contemplates that even-aged management techniques will be used only in exceptional circumstances. Yet, the defendants would utilize even-aged management logging as if it were the statutory rule, rather than the exception. Sierra Club v. Thomas, 1 05 F.3d 248 (6th Cir. January 21, 1997).

See Alternative 4 and Alternatives Considered but Eliminated from Detailed Study. Also, see the Vegetation section of Chapter 3 p. 156-163 and Appendix F.

Comment 9-60

The Forest Service needs to consider true uneven-aged mangement (selection management). The Forest Service must not attempt to use "patch clear-cutting" in place of "group selection." Group selection does not use area regulation, it uses diameter distribution regulation. The Forest Service also needs to consider the research done in Illinois on Group Selection. [Robinson, Scott "Effects of Selective Logging on Forest Birds in the Trail of Tears State Forest, Southern Illinois.] The research identified group slection openings as "eclogical traps." Many species were attracted to the openings, which appeared to be suitable habitat. These species, however, did not successfully reproduce due to predation and cowbird parasitism. The study concluded, "If land is to be logged, single tree selection at low volumes removed (<20%) and long (15-20 years) cutting intervals is the method that will have the least adverse impact on forest bird communities."

Both individual tree selection and group selection were considered in the East Side Project analysis on sites where its use is appropriate. Amounts vary by alternative. Discussion about the detailed consideration given to uneven-aged management can be found in East Side Appendix F; Appendix B

Comment 9-60 cont.

pp 15-20 and Table 23; and FEIS pp. 30, 148, 156-163, 177-179,209, and 226-227 (Alternative 4 discussion, 251-253, and 258-260).

Comment 9-61

Herbicides & Pesticides-

It is inappropriate to spray toxic chemicals on public lands as part of a timber sale. The Forest Service needs to fully develop and consider alternatives that do not use any herbicides. The Forest Service needs to consider the impact of the inert chemicals in the herbicides and pesticides. The Forest Service needs to consider the secondary impacts, including impacts to non-target species, water supplies, and human health, of the toxic chemicals.

The analysis needs to identify and consider all key plants in the area to be treated. The analysis must identify the effects of herbiciding on these plants and the cascading effects spraying will have on wildlife and the ecological community.

The appropriateness of considering the use of herbicides to achieve reforestation and wildlife objectives on the Allegheny National Forest has been considered in great detail in the ANF Forest Plan FEIS and the ANF FEIS for Understory Vegetation Management. The ANF Forest Plan Record of Decision (1986_ Pp 15-17, 31, 34-35) and the ANF FEIS for Understory Vegetation Management Record of Decision (1991, pp 3-8) provide the decisionmaker's rationale permitting them to be considered and selected in site-specific projects.

The East Side project considered an alternative that excludes herbicide use (FEIS, p. 32). The ANF Forest Plan also considered a similar alternative (Alternative B) as did the FEIS for Understory Vegetation Management (1991, Chapter 2 pp 3-5). The latter FEIS provides a detailed discussion of many "secondary impacts" (as you have termed them) in Chapter 4 (pp 1-25), human health effects in Appendix A and in Chapter 4 (pp 6-12), inert ingredients (Appendix A, Section 3 pp 13-14), and potential risks to wildlife and aquatic species (Appendix C pp 1-8). Impacts to plants are discussed in the Eastside FEIS (pp. 144-146,164, 171-179, 185, 187, 201-202 210, 223-229.

Comment 9-62

Biomass Burning-The issue of impacts of prescribed-burning must be considered. Fire in the past has been considered as one of the best methods of not onlv vegetation control, but also of waste disposal. This practice must be reevaluated.

Prescribed burning has been dropped from the East Side project proposal.

Comment 9-63

The global effects of fire on global warming must be considered. In a paper, Fung of the Goddard Institute of Space Studies, NASA concludes that the northern forests (as opposed to tropical) are also important in the carbon cycle and indeed are sinks for Carbon Dioxide. The analysis must consider the impacts of burning on global warming.

This comment is beyond the scope of the East Side project.

Comment 9-64

The issue of air quality degradation as a result of burning must be addressed. Burning is a chemical process that produces a plethora of noxious chemicals. Burning generates 323 pounds of particulates per acre containing, among other systemic poisons, a number of polyaromatic hydrocarbons (PAH) such as benzo-a-pyrene, benzofluoranthrene, methyl-cholanthrenes and many others are typical. All these are acknowledged carcinogens. [Dost, F.N. 1986. "An estimate of carcinogenic risk associated with polyaromatic hydrocarbons in smoke from prescribed burning in forestry." Pestic. Advis. Memoranda 4.02. Washington, DC: U.S. Dep. Agric., For. Serv. 16p.]

We feel that introduction of such large amounts of PAH is in violation of several provisions of the Clean Air Act. Since particulates do eventually precipitate, regardless of dilution, the willful act of prescribed burning violates the intentional adulteration provision of FDA and USDA regulations.

Burning has been dropped from the East Side proposal.

Comment 9-65

The issue of soil heating needs to be considered. Underburns have produced temperatures as high as 700'C [M artin, RE. 198 1. "Prescribed burning techniques to maintain or improve soil productivity." In (Hobbs, S.D.; Helgerson, O.T.; eds) Proc. Refor. of Skeletal Soils, Medford, OR, Nov. 198 1, p. 66-70 (Avail from OR State Univ., For. Res. Lab, Corvallois, OR.] and slash burns up to 12600C. EBarnett, D. 1984. Effects of fire on Coast Range sites. Siuslaw NF,Waldport, OR 129p.] Heating can kill soil biota, alter soil physics, consume organic matter, release site nutrients including heavy metals such as mercury.

Burning has been dropped from the East Side proposal.

Comment 9-66

The issue of loss of organic matter needs to be considered. Organic matter is vital to soil quality. [Jorgensen, JR.; Wells, C.G. 1986. Foresters' primer in nutrient cycling. USDA For. Serv. Gen. Tech. Rep. SE-37,42p.] The analysis must address the effects of burning on the consumption of Litter and Duff and the resulting degradation of soil quality.

Burning has been dropped from the East Side proposal.

Comment 9-67

The issue of loss of Nitrogen from burning needs to be considered. Nitrogen is very important in plant growth and has taken centuries to accumulate. [Pritchett, W.L.; Wells, C.G. 1978. "Logging and site preparation increase nutrient mobilization." In (T. Jibbin, T, ed) Proc. Sym. on Prin. on Main. Prod. on Prep. Sites, MS State Univ. p 98-110.] Half of the Nitrogen in the top 16-20 inches of soil is in the top 6 inches. [McKee, W.H. 1982. "Changes in soil fertility following prescribed burning on Coastal Plain pine sites." USDA For. Serv. Res. Pap. SE-234, 23 p.] Burning releases Nitrogen which is leached by rainfall and up to 50 percent is lost [Feller, M.C. 1982. The ecological effects of slashburning with particular reference to British Columbia-a literature review. Prov. BC Ministry of Forests Pub. R28-81072.] The loss of Nitrogen form burning must be analyzed.

The issue of loss of other nutrients needs to be considered. Fire causes phosphorus, potassium, calcium and magnesium to be lost to the atmosphere by ash convection and leaching. [Jogensen, J. R.; Wells, C.G. 1986 ibid.] The effects of the loss of nutrients needs to be analyzed.

Burning has been dropped from the East Side proposal.

Comment 9-68

The issue of erosion and sedimention as a result of burning needs to be considered. Burning significantly increases erosion. [Ralston, CW.; Hatchell, G.E. 1971. "Effects of prescribed burning on physical properties of soil. In Proc. Prescribed Burning Sym., Charleston, SC, April 197 1, p 68-84 (Avail. from USDA Forest Service, SE Forest Experimental Station, Asheville, NC.1 The effects of stormflows, channel erosion, surfac erosion and sediment yield must be analyzed.

Burning has been dropped from the East Side proposal.

Comment 9-69

The issue of mercury contamination needs to be considered. Soil heating and mineralization may release mercury from the soil; this issue must be analyzed.

Burning has been dropped from the East Side proposal.

Comment 9-70

Indiana Bat-The Federally Endangered Indiana bat needs to be considered. The analysis needs to consider all available research. The ESA requires the Forest Service to use "the best scientific and commercial data available" to fulfill its Section 7 obligations. The analysis needs to consider the summer habitat required by female Indiana bats for maternity roosts (e.g., roost trees, protection from disturbance, and foraging habitat). The analysis also needs to consider the summer roosting and foraging needs of male Indiana bats. The analysis on roosts needs to consider existing and potential roosts in upland and riparian areas and the issues of bats using the trees while the sale is being cut (which would result in their death by killing them when their roost is cut or being killed by an adjacent tree falling on them), loyalty to the roost trees, stress of finding new roosts, and the impacts of removing trees next to roosts or potential roosts (i.e., making the tree more suspectable to windthrow and changing the thermal dynamics). The analysis also needs to consider the email message from Dr. John Whitaker that we sent to the Forest on September 6, 1999. The analysis also needs to consider the impact the logging will have on opening the area which allows other species of bats and birds to compete with the Indiana bat for the insects. Likewise, the analysis needs to consider the issue of additional predators that the Indiana bat

Comment 9-70 cont.

will be exposed to as a result of opening the canopy. The analysis also needs to consider if there are any hibernacula in the area. If so, the analysis needs to consider the impacts of the sale on the bats' summer, fall, spring, and winter habitat. The Forest Service also needs to consider the rulings in House v. United States Forest Service, 974 F.Supp. 1022 (E.D.Ky. 1997) and Bensman v. United States Forest Service, 984 F.Supp. 12,4~2 (W.D.Mo. (1997)). These rulings specifically rejected all the Forest Service's standard claims about why the logging will not have any adverse effects on the Indiana bat and ruled that the timber sales in question will "take" the Indiana bat.

*As a minimum these studies need to be addressed:

Callhan III, Edward, "Indiana bat Summer Habitat Requirements" Masters Thesis, University of Missouri, May 1993. (Callhan, 1993.)

Gardner, J.E., Garner, J.D., and Hoffmann, J.E. 1991 "Summer roost selection and roosting behavior of Myotis sodalis (Indiana bat) in Illinois.: Unpublished Report, Illinois Natural History Survey, Chamapaign, Illinois. (Gardner 199 1)

Kiser, James D. and Charles L. Elliot "Foraging Habitat, Food Habits, and Roost Tree Characteristics of the Indiana Bat (Myotis sodalis) During Autumn in Jackson County, Kentucky."

Clawson, Richard L., "Report on the Status of Priority I Indiana bat Hibernacula, 1995."

Clawson, Richard L., "Indiana Bat Summer Habitat Patterns in Missouri" (Clawson 1996)

Kurta, Allen, and Kimberly Williams "Roosting Habitat, Microclimate, and Behavior of the Endangered Indiana Bat (Myotis sodalis) in Southern Michigan." Eastern Michigan University, October 1, 1992.

Romme Russell C., Karen Tyrel & Virgil Brack, Jr., "Literature Summary and Habitat Suitability Index Model, Components of Summer Habitat for the Indiana Bat, Myotis sodalis" March 20, 1995

Gardner, James E., Joyce Hofmann, and James D. Garner, "Summer Distribution of the Federally Endangered Indiana Bat (Myotis sodalis) in Illinois" Transactions of the Illinois State Academy of Science (1996), Volume 89, 3 and 4, pp. 187-196.

We responded to this comment in the FEIS for Threatened and Endangered Species on the ANF, July 2000 (p.F-45). The analysis of Indiana bat habitat in Appendix C of the East Since FEIS is based on the Biological Opinion prepared by the FWS June 1999) and the Draft Indiana Bat Recovery Plan (March 1999) which was developed by the top bat experts in the Nation and represents the consensus of these experts on the biology, habitat, and management of the Indiana bat.

As described in the Recovery Plan, there may be variations in habitat preferences and use for the Indiana bat throughout its range. However, the ANF relies heavily on the information presented in the Recovery Plan. In addition, information included in the FEIS for Threatened and Endangered Species is based upon 3 years of ongoing monitoring for the Indiana bat and continued an on-going informal consultation with the FWS. As a result, analysis and information presented in the FEIS for Threatened and Endangered Species is based on the most current and applicable information related to Indiana bat habitat and populations on the ANF.

Comment 9-71

Oak/ Hickory-

The issue of the loss of the oak/hickory component needs to be addressed. Research shows the best way to maintain the oak/hickory component is to refrain from logging. [Mills Jr., W.L., B.C. Fischer and T.W. Reisinger, "Upland Hardwood Siliculture: A review of the Literature." Purdue University Station Bulletin No. 527.] Many areas with certain slope and aspect will never have a substantial oak/hickory component.

Addressing issues related to the oak/hickory forest type are outside the scope of this analysis since this project is located outside of the area where the oak/hickory forest type occurs on the ANF. The Vegetation Report for the East Side Project provides a detailed listing of the existing forest type for each stand proposed for treatment in the East Side Project (see Table 22 in Appendix B. p B-27). This information is in the column labeled "Forest Type", and the forest type codes are defined in Table 21 (p B-24). As you can see, there are no oak/hickory stands proposed for treatment in this project. Furthermore, the data in Table 49 (FEIS p. 141) indicates there are only 39 acres of oak/hardwood transition forest within the entire 136,261 acres of forest cover in the project area.

Conversion of the oak forest type to other forest types was an issue addressed in the ANF Forest Plan EIS (1986, Chapter 1 p 22 and Appendix C p 50). ANF policy is to maintain the oak/hickory forest type (ANF 1986 ROD, p 16).

Letter #10 – Brian Topping

Comment 10-1

I am against the proposed East Side Timbor [sic] sale, I think that more effort should be spent on conserving PA's only National Forest and sustainable forest practices.

Comment noted.

Letter #12-#14

#12 - Andrew Gianni
#13 – Matt Caesar
#14 – Peter Larson

Comment 12-1

See Comment Letter #15: This Letter (No. 12) is exactly the same as Letter15 with the exception that it does not contain comment #.13. See original letters in Project File.

Letter #s15-21, 23, 40, 42, , 44-46, 48-64, 71-73, 75, 81-86, 88-94, 96-97, 99-100, 105-119, 122-126

#15 - Jim Kleissler
#16 - Danielle Redden
#17 - Janice DeCarolis
#18 - Jean DeSabato
#19 - Christine DeCarolis
#20 - Carol Sinatra
#21 - Thomas Bachelder
#23 - Jeanne Freyer
#40 - Holly Haworth
#42 - Michael Kruse
#44 - Josh Knauer
#45 - Barbara Warner
#46 - Michael Kukla
#48 - Elisa Bondar
#49 - Victoria Lehman
#50 - Joyce Tseng
#51 - Maurina Roberts
#52 - Erin Jones
#53 - Lori Porcelli
#54 - Martha Wicklehaus
#55 - Kevin Balaz
#56 - Linda/Sam Caputo
#57 - Kathleen Orion
#58 - Karyn Kaplan
#59 - Lori Hammer
#60 - Newkirk Johnson
#61 - Chris Sullivan
#62 - Peter Zawadzkas
#63 - Dev Hathaway
#64 - Charles Aston
#71 - Paul Brown
#72 - Mary Havrilla
#73 - Ray Schlee
#75 - Mark Donham/Kristi Hanson
#81 - Gwyndolyn Griffin
#82 - Sue Whayne
#83 - Marie Hathaway
#84 - Shannon Hughs
#85 - Brenda McMahon
#86 - Joseph Rhodes
#88 - Jerry Martello
#89 – Beverly Braverman
#90 - Josiah Groff
#91 - Alfred Seiss
#92 - William Belitkus
#93 - Diane Donham
#94 - Patricia Kinsman
#96 - Fritz Paltzke
#97 - Gale Cook
#99 - Hillary Aisenstin
#100 - Eric Gallo
#105 – Larry Zalewski
#106 - Christy Wojculewski
#107 - Ray Fenner
#108 - Joseph Cassacio
#109 - Carla/Paul Yamvert
#110 - Brian King
#111 - Tom Bik
#112 - Erik Lazdins
#113 - Marty Berghoffen
#114 - Apryle Carney
#115 - KP
#116 - Corrie Bosman
#117 - Karnan Devlin
#118 - Steve DiPietro
#119 - Group Against Smog and Pollution
#122 - Marty Light
#126 - Dan Rain
#127 - Meg Ferrigno
#128 - Gary Kolb
#129 - Nubia Perez

Comment 15-1

I am writing to protest the proposed East Side Timber Sale. This sale, previously titled "Mortality II", poses a serious threat to the native ecology of the Allegheny National Forest.

Comment noted.

Comment 15-2

As you know, the East Side Timber Sale calls for 8,666 acres of logging, of which more than 3,000 acres will be clearcuts! This will cause major harm to wildlife by fragmenting their habitat, causing direct mortality to wildlife by felling trees occupied by nesting bats, birds, and other animals, dramatically altering their local environments, removing bio-mass essential to their survival, and increasing sediment flow into watersheds resulting in degradation of the high water quality upon which aquatic life depends.

See the description of alternatives in Chapter 2 for a breakdown on harvest proposals by alternative by treatment method. See the Wildlife section p. 205 and 221-223 for discussions of fragmentation. Also, see Comments 129-57 and 129-58. For discussions of sedimentation, see the Water and Watershed section of Chapter 3 p. 83-86. Also, see Comments 129-286 and 129-287.

Comment 15-3

Ecologically sensitive areas targeted for logging include the Crane Run watershed, the Mill Creek watershed, the Bluejay Creek watershed and the Bear Creek watershed.

Comment noted.

Comment 15-4

Crane Run is an important wilderness trout stream essential to the recovery of rare wildlife populations. The East Side Timber Sale calls for logging in this watershed adjacent to one of the most important old growth remnants in the eastern United States. The logging at Crane Run should be abandoned.

Comment noted. Any logging that takes place in the watershed will be required to follow standards and guidelines for the protection of Crane Run, which also includes any State guidelines for Wilderness Trout Streams or Exceptional Value streams. See Appendix D, Mitigation Measures.

Comment 15-5

Mill Creek is an important area that contains the most important documented populations of endangered Indiana bats on the entire Allegheny National Forest. No logging should occur in this area.

Comment noted. All proposed activities are structured to meet the requirements set forth in the Biological Opinion from the USFWS. The determination for the Indiana bat can be found in the Biological Assessment, Appendix C.

Comment 15-6

Similarly, Bear Creek watershed houses a rare population of the northern water shrew, a Sensitive species on the Allegheny National Forest. Forestry practices within the watershed are cited by researchers as a major concern.

Comment noted. All proposed activities are structured to meet the requirements set forth in the Biological Opinion from the USFWS. The determination for the Northern water shrew can be found in the Biological Assessment, Appendix C.

Comment 15-7

Bluejay Creek contains an important forest area that was previously protected to grow into old growth conditions. The East Side Project removes that designation and logs that area.

The forest plan does not require that all areas designated as old growth candidates be kept in perpetuity. The area in Bluejay Creek is no longer providing a diversity of features characteristic of Old Growth due to sever mortality and management will ensure the sustainability of forested condition.

Comment 15-8

Many other areas that are proposed for logging activity include important rare species and are vital to dispersed recreation opportunities. The East Side Project threatens to fragment 140,000 acres of vital wildlife habitat.

See the Wildlife section, p. 205.

Comment 15-9

The Forest Service needs to conduct wildlife and plant surveys of these areas and must use this assessment of their occurrence to design appropriate protection measures for wildlife including the establishment of old growth core areas and connection corridors.

Surveys have been completed for the East Side project area and summaries of these surveys are located in the project file. Through its Forest-wide wildlife monitoring efforts (wetland plant surveys, breeding bird transects, etc.), as well as project level surveys, the ANF has been collecting data on a wide variety of wildlife, including threatened, endangered and sensitive plant and animal species. As a result, sufficient survey data has been conducted to adequately assess wildlife diversity within the East Side project area. Forested core areas, old growth and travel corridors are discussed under Landscape Patterns, p. 202 of the wildlife section.

Comment 15-10

The East Side Timber Sale also calls for the heavy use of the toxic herbicides Roundup (Glyphosate) and Oust (Sulfometuron methyl) on nearly 3,500 acres. These chemicals are documented to have toxic effects on mammals. Your proposal calls for herbicide use within and near occupied habitat for the rare northern water shrew. Shrews have been found to be sensitive to the application of these herbicides.

We responded to this comment in the FEIS for Threatened and Endangered Species on the ANF (p.F-37). Analysis documented in the FEIS for Understory Vegetation Management (USDA 1991) indicates there are no significant toxicity risks to wildlife species from planned use of glyphosate and sulfometuron methyl on the ANF (USDA-FS 1991, Chapter 4 p.16 and Appendix C pp. 1,3,7,8). The results of additional studies on the effects of these herbicides on small mammals was reported in the FEIS for Vegetation Management on Electric Utility Rights-of-way (USDA-FS 1997a, Chapter 4, p. 110). Also, see Comments 129-59 to 129-68.

Comment 15-11

The East Side Timber Sale also calls for nearly 125 miles of logging road construction, including more than 15 miles of new logging roads. The Allegheny National Forest is already too heavily roaded. The Forest Service should be emphasizing de-commissioning and revegetating roadways. In addition, the Forest Service plans to "develop" 10 new pits and expand 33 existing pits for the extraction of stone. This will result in serious scars within the forest that will not return to anything close to a forested condition for many years.

Alternative 3 was developed to address concerns with constructing new road corridors and improving existing road corridors. Every reasonable opportunity to use existing corridors rather than construct new corridors is used. This project includes several opportunities to realign existing road corridors away from streams and riparian areas. Other segments of roads that are no longer needed for resource management are included as decommissioning (see Table 36). The development of new pits and the expansion of existing pits is an "irretrievable" allocation of resources (see pp. 128-129). These areas are not expected to return to a forested condition. After use, they will be revegetated, typically with a wildlife covering.

Comment 15-12

I am deeply concerned about the use of my public lands and taxpayer money for the liquidations of our trees. It is not right that you are damaging our public lands for private gain.

Comment noted.

Comment 15-13

Please hold public hearings for the East Side Project in each of the surrounding major cities (Pittsburgh, Cleveland, Buffalo, Ithaca, New York, Philadelphia, Erie, and Harrisburg). I would like the opportunity to learn more and more effectively contribute to the process.

No specific requests for public meetings were received. The broad request in this letter and the 69 others with the exact same wording plus one other letter with similar wording were the only requests received.

Comment 15-14

Please support the Allegheny National Forest by selecting an alternative that calls for zero-cutting, zero herbicide use, and the revegetation of logging roads to a forested condition.

See the Record of Decision for the rationale for the selection of the Preferred Alternative.

Letter #22 - John Mitchell

Comment 22-1

I am writing to express my vehement opposition to the logging operation known as the 'East Side Project'. This would involve 3,000 acres of clearcuts, general logging of almost nine thousand acres and the reconstruction of nearly 125 miles of roads. The Allegheny National Forest is public land that should be protected for the benefit of wildlife and plant life. It should not be a source of revenue for logging companies.

Comment noted.

Comment 22-2

I urge you to oppose logging on these lands and preserve their natural beauty.

Comment noted.

Letter #24 – Ed MacAuley

Comment 24-1

Dear Johnny: (Unless you've already gone through with it ...)

Comment noted.

Comment 24-2

Stop this "East Side Timber Sale"!!

Comment noted.

Comment 24-3

Black-cherry is not native to Pennsylvania forests (in the Allegheny Nat'l Forest) and you have no right to use planting B.C's as an excuse for highgrading and clearcutting in it - which you shouldn't do anyway,

Black cherry is a tree species native to Pennsylvania. See the Purpose and Need section of Chapter 1.

Comment 24-4

Johnny, My mailing address to reply to - but, please if you do so (reply) try to not make it sound like that usual bureaucratic bullshit and excuse making you usually spin! Ed

Comment noted.

Letter #25 – Chris Schimmoeller

Comment 25-1

We in Kentucky are horrified at your outrageous East Side Project proposal. How can you justify such an enormous timber sale when your own agency is directing you to minimize and obliterate roads and adopt ecosystem forest management?

Comment noted. See the Purpose and Need section Chapter 1.

Comment 25-2

As a public servant, you have a duty to listen to public opinion about forest management.

Comment noted.

Comment 25-3

To date it's obvious that you have ignored public calls to address zero cut alternatives.

See Alternatives Considered but Eliminated from Detailed Study, p. 34.

Comment 25-4

You have created a clear record that violates the mandates of the NEPA and the ESA, which requires you to protect and recover listed species and their habitat, not destroy it.

See Appendix C, the Biological Assessment. All laws and regulations are being followed.

Comment 25-5

Please cancel the Eastside Project.

Comment noted.

Letter #26 – Daniel Cross

Comment 26-1

I have recently received startling information regarding the Forest Service's plans for a massive timber sale in the Allegheny Forest known as the East Side Project. The plan, which would result in the logging of over 8,000 acres of public lands, including over 3,000 acres of clearcuts, and which would spray almost 3,500 acres of the forest with toxic herbicides harmful to wildlife and humans alike, is the number one sell-off of public assets in the Eastern United States. This plan, if put into effect, will not be healthy for the forest as the Forest Service claims, but instead is the complete opposite. The toll. that this plan would take on the plants and animals in the Allegheny Forest is incalculable.

I feel that this plan is destructive and would deal a devastating blow to the forest and its inhabitants; consequently, I ask that it not be put into effect. I support the National Forest Protection and Reforestation Act and feel very strongly that public lands should not be open to logging. I'd like to thank you for your time in this very important matter and I respectfully await your reply.

Comment noted. See the Purpose and Need section of Chapter 1. See the Human Health and Safety section of Chapter 3. Also, see the Understory Vegetative Management Final Environmental Impact Statement.

Letters #27, 32 – Cynthia Wutchiett; Wutchiett & Associates

Comment 27-1

I am writing to ask you to cancel the proposed East Side Timber Sale. (See also original Letter #32 (not entered)-nearly exact copy of this letter from same commentor)

Comment noted.

Comment 27-2

As a taxpayer I am very upset over the continued use of my tax dollars to destroy the natural environment on my land for the private gain of multinational logging corporations (Willamette Industries; Georgia Pacific; Bradford Forest Products-a subsidiary of the Danser Group, a German company; International Paper; and Temple Inland).

With less than 4% of the wood products in our country originating from National Forests, it is clear that logging them is unnecessary. An adequate supply of timber can be obtained from private land. An adequate supply of wildlands, wildlife habitat, old growth forests, and outdoor recreational areas are not available on private lands. Our publicly owned National Forests must provide these amenities for usand they will if you will stop managing our National Forests as if they were industrial farms set aside for the benefit of corporate profits.

Read your own surveys! Nearly 70% of Americans surveyed in a recent poll conducted by the National Forest Service said they are opposed to logging our National Forests. If you are not managing our National Forests for the public's interest, then whose special interests are you managing them for? (See also original Letter #32 (not entered)-nearly exact copy of this letter from same commentor)

Comment noted. This comment is beyond the scope of the East side project.

Comment 27-3

Your boss, Mike Dombeck, has stated that because the Forest Service has more roads than it has the money to maintain, no new roads should be constructed-yet the East Side Timber Sale will include 15 miles of new roads and reconstruction of another 110 miles of roads. Do us an a favor and obey your boss's directive and quit building roads and further fragmenting wildlife habitat. And quit wasting my tax dollars on roads that I do not want. Instead, use my taxes to obliterate roads and restore the natural vegetation and contour of the land. (See also original Letter #32 (not entered)-nearly exact copy of this letter from same commentor)

See the Purpose and Need Section of Chapter 1. Also, see the Wildlife section Chapter 3, p. 205 for a discussion of fragmentation.

Comment 27-4

Lastly, I request the Forest Service to hold public hearings for the East Side Timber Sale in each of the surrounding major cities (Pittsburgh, Cleveland, Buffalo, Ithaca, New York, Philadelphia, Erie, and Harrisburg). The public has a right to comment on the mismanagement of our publicly owned land. (See also original Letter #32 (not entered)-nearly exact copy of this letter from same commentor)

No specific requests for public meetings were received other than the general request to hold meetings at several locations.

Letter #28 – Thomas Bachelder

Comment 28-1

I am writing to protest the logging plans pending for the Allegheny National Forest in Pennsylvania (ANF).

Comment noted.

Comment 28-2

The East Side Project, involving nearly 9000 acres, calls not only for logging in ecologically sensitive areas and the construction of 15 miles of new roads in a forest already over accessed by roads, but also includes plans to clear-cut more than 3,000 acres of woodland to spray toxic herbicides on almost 3500 acres.

Considering the mounting evidence supporting the essential role played by forests in the maintenance of a healthy environment I think it unconscionable to even suggest the idea of clear-cutting and poison spray in the 2 1 st century. Unless, of course, one's ultimate objective is to turn large tracts of our national forests into mono-culture tree plantations; in ANF's case perhaps a black cherry plantation. These tree farms, composed of even age, single species trees, lack in all manner the diversity necessary of a true forest and can never replace what nature took hundreds of years to produce.

"If one way be better than another, that you may be sure is Nature's way." –Aristotle

See the Purpose and Need section of Chapter 1.

Comment 28-3

Let the private lumber corporations secure their own acreage for such "renewable" resource crops. Keep them out of our tax-payer supported, publicly owned national forests.

Comment noted.

Letter #29 – Charles Aston

Comment 29-1

I am writing to protest the resumption, in any form, of clear-cutting of the Allegheny National Forest whether on the "east side" or elsewhere. As a U.S. and Pennsylvania Commonwealth taxpayer, I deeply resent that an agency of my governments, e.g., the U.S. Forest Service, uses it's power and authority to commercially promote, assist, or enhance the clear-cutting of original (or second growth) forests. I find, consistently the disregard for over-all and long-term ecological impacts on the part of the Forest Service in its forest management practices in general and, especially, in the case of the A.N.F. East Side proposal, is inexcusable.

Comment noted.

Comment 29-2

I am a mature, educated adult, fully employed, a "typical" tax-paying citizen who happens to also have children and grand children and I am frightened and deeply concerned (and extremely angry) about the ecological future we are leaving these generations.

Comment noted.

Comment 29-3

I would like to hear from you personally about my deeply felt concern (but don't bother if all you are going to do is send a government approved form letter response).

Comment noted.

Comment 29-4

Thank you for any consideration that you give this letter.

Comment noted.

Letter #31 - William Menke, USDI, National Park Service

Comment 31-1

These comments are in response to the draft East Side EIS. In general, we are pleased to see that many of our previous suggestions were considered in the preparation of this document.

Comment noted.

Comment 31--2

- We are pleased to see the attention being paid to protecting the scenic and recreational value the North Country Trail, as reflected in the draft EIS, and find the document to be adequate in assessing potential impacts to those values associated with various alternative approaches to vegetative management.

Comment noted.

Comment 31-3

- We find the preferred altemative (#1) acceptable and sufficiently protective of the trail's values. It is in harmony with the comprehensive plan for management and use of the trail.

Comment noted.

Comment 31-4

- On page 194 we are pleased to see that the entire North Country Trail is placed in the Sensitive Level 1 classification. The mitigation measures (including seasonal restrictions, two-age treatments, slash disposal, and leaf-off harvest) for SL- 1 appear to adequately protect the trail while implementing the preferred alternative. NOTE: We cannot recall ever reviewing an Allegheny National Forest project document where this was not true.

Comment noted.

Comment 31-5

However, we still get reports that logging operations have left slash on the trail or that logging skid roads have impacted the trail. Is a breakdown occurring between the mitigation measures that are spelled out and the on-the-ground operations? This may need to be looked into.

Logging operations are reviewed near trails to ensure the trail is protected. However, there may be periods during the actual operations where slash may lie on the trail for a few days. Following logging operations, the trail is again reviewed to ensure trail markings are adequate and mitigation has been performed.

Comment 31-6

- We remain critical of the East Side EIS, and all forest project documents, for not including the North Country NST on the project maps. All of the maps are generated with GIS technology. It doesn't seem overly difficulty to add one more layer to indicate the' North Country Trail without including all other trails - after all, it is a National resource and should have a distinct GIS layer. When the trail is not indicated, we attempt to transpose it onto the project maps from other available maps with the results being somewhat less than accurate.

  The trail is not shown on the index map set, but it shown very faintly on the alternative maps. However, on the alternative maps, it is not labeled as the North Country Trail, and is shown in the same line type as roads. This will be corrected in future documents. Thank you for pointing out this problem.

Comment 31-7

Again, thank you for the opportunity to comment.

Comment noted.

Letter #33 – Robert Meuller

Comment 33-1

I'm shocked and disgusted that you could consider the destructive Eastside Project! 3000 acres of clearcuts is beyond belief!

Comment noted.

Comment 33-2

Logging in sensitive species habitat is a violation of the ESA!

Please see the Biological Assessment, Appendix C.

Comment 33-3

And there is nothing worse than a logging road, of which you proposed > 15 miles!

Comment noted.

Comment 33-4

I strongly urge you to withdraw this project.

Comment noted.

Letter #34 – Sherman Bamford

Comment 34-1

I am opposed to the East Side timber sale.

Comment noted.

Comment 34-2

Your proposal for up to 8,666 acres of intensive logging and up to 125 miles of logging roads is a SERIOUS MISUSE of our public lands.

Comment noted.

Comment 34-3

I am opposed to your plans for logging adjacent to old growth forests and in areas that were previously protected as future old growth reserves,

Comment noted.

Comment 34-4

I am opposed to your plans for].. logging in hundreds of acres of cutting in Crane Run - a wilderness trout stream watershed,

Comment noted.

Comment 34-5

See Comment Letter #15. [I am opposed to your plans for].. logging in northern water shrew and Indiana bat.

Comment noted.

Comment 34-6

See Comment Letter #15. [I am opposed to your plans for] ... massive herbicide spraying as well.\

Comment noted.

Comment 34-7

Please put a stop to this atrocious project and save some of the forest for future generations.

Comment noted.

Comment 34-8

End commercial logging on national forests.

This comment is beyond the scope of the East Side project.

Letter # 35 – Robert Vavrilla

See Comment Letter #15. All comments are exactly the same except that comments # 5, 6, and 7 are missing as well as some missing words that did not change the context of the comments. See original letter #35 in Project File.

Letter #36 –Megan Rancier

See Comment Letter #15 *This letter starts with the following comment: I think that one of the most worrisome problems in America today is that of profits overshadowing sustainability. Therefore, I am writing to protest*.. All the other comments are exactly the same. See original letter #36 in Project File.

Comment noted.

Letter #37 –Mark Freed

See Comment Letter #15 . This letter starts with the following comment: *The begining [sic] of this letter might seem different, but it's not. The message is the same and I'll repeat it once again. You must hear it over and over until something is done! I am writing to protest…* All the other comments are exactly the same. See original letter #37 in Project File.

Comment noted.

Letter #38 – Brooke Nuckles

See Comment Letter #15. This letter starts with the following comment: *As a Pennsylvania resident, specifically Allegheny County, I have visited the Allegheny National Forest since childhood. I have enjoyed camping hiking, observing wildlife and just the overall beauty of the forest. When I think of the Allegheny National Forest I do not like to think of logging and the destruction of a beautiful and delicate ecosystem. I am writing to protest…* All the other comments are exactly the same. See original letter #38 in Project File.

Comment noted.

Letter #39 –Anne Kretschmann

See Comment Letter #15. The comments in this letter are exactly the same as Letter#15 except as noted in this and the 3 revised comments entered: Comment #1 is missing the words "*previously titled "Mortality II*". See original letter #39 in Project File.

Comment 39-1

See Comment Letter #15; comment #5 is the same except for an additional comment denoted with ** as follows: Mill Creek is an important area that contains the most important documented populations of endangered Indiana bats on the entire Allegheny National Forest. *****There are lawsuit implications if populations of endangered Indiana bats are harmed in any way.**** *No logging should occur in this area*.

Comment noted. Please see the Biological Assessment, Appendix C.

Comment 39-2

See Comment Letter #15 Comment: #9 is the same except for slight wording change denoted with **: *Many other areas that are proposed for logging activity include important rare species and are vital to dispersed recreation opportunities. The East Side Project threatens to fragment 140,000 acres of vital wildlife habitat. The Forest Service needs to conduct wildlife and plant surveys of these areas and must use this assessment of their occurrence to design appropriate protection measures for wildlife including the establishment of old growth core areas **and connecting wildlife corridors***.

Please see the Wildlife section, p. 205 for a discussion of fragmentation. See p. 190-191 for a discussion of old growth.

Comment 39-3

See Comment Letter #15. Comment #39 is the same except for the following additional statements denoted with **: *The East Side Timber Sale also calls for nearly 125 miles of logging road construction, including more than 15 miles of new logging roads. The Allegheny National Forest is already too heavily roaded. The Forest Service should be emphasizing de-commissioning and revegetating roadways. In addition, the Forest Service plans to "develop" 10 new pits and expand 33 existing pits for the extraction of stone. This will result in serious scars within the forest that will not return to anything close to a forested condition for many years. **In addition, roads allow certain predators to take advantage of access to the forest, where normally they would not have it. Coyotes, for example, often follow roads, taking over bobcat habitat and prey.*****

Comment noted. Also, see the Transportation section of Chapter 3.

Letter #41 – Melissa Roberts

See Comment Letter #15. Comment #41 is the same except for the addition of one final comment. See original letter #41 in Project File.

Comment 41-1

A national forest is of national interest.

Comment noted.

Letter #43 - Frank Eckel

See Comment Letter #15. Note: Two emails of the same letter were received, one dated 05/25/00 and a second one dated 6/5/00 with the additional final comment noted below. Comment #43 is the exactly the same as Letter #15 except for the addition of one final comment in the second letter received. See original letter #39 in Project File.

Comment 43-1

"***I would also like a reply to this email to f45one@hotmail .com to assure me that the government officals [sic] do care about citizens input***." John Palmer emailed commentor back with acknowledgement (email response attached to original letter in project file).

Letter #47 – Susan Curry

See Comment Letter #15. Comment #41 is the same except for the addition of one final comment. See original letter #47 in Project File.

Comment 47-1

"Please do me a favor and do not consider my comments as a form letter. I am in full agreement with all that is written here and understand its meaning ot the fullest extend [sic]. Disregarding my comments could only do a disservice to democracy and the public participation process.

Comment noted.

Letter #65 – Jim Kleissler, Allegheny Defense Project

Comment 65-1

I am writing to ask that you withdraw the Draft EIS for the East Side Timber Sale and issue a new one. Our recent correspondence makes it clear that the Forest Service is not prepared to move forward on the project at this time and follow federal laws.

Comment noted. All laws and regulations have been followed.

Letter #66 - Adam Rissien

Comment 66-1

I am writing this in response to the East Side Timber Sale formerly known as the Mortality II Sale.

Comment noted.

Comment 66-2

The proposed action is unacceptable.

Comment noted.

Comment 66-3

We trust the Forest Service to maintain a healthy forest ecosystem not play the puppet for the timber industry. By law you are supposed to weigh in all the economic benefits of a sale such as this. But where are the numbers for recreation or water filtration or any of the numerous services the forest provides while standing? Salvage logging is an excuse to take away our natural heritage and it is a testament to what the Forest Service stands for, corporate welfare.

See the Purpose and Need section of Chapter 1. Also, see the Recreation and Water and Watersheds sections of Chapter 3.

Comment 66-4

I urge you to rescind this sale and be a steward not a stooge.

Comment noted.

Letter #67 - Larry Hutchins

Comment 67-1

I have reviewed all of your materials and support Alternative 1!

Comment noted.

Letter #68 –Donald Dukelow

Comment 68-1

I have reviewed the April 2000 Summary for the East Side Project. You and your staff are to be complimented for the good work that has gone into this study.

Comment noted.

Comment 68-2

Alternatives 1 and 3 make the most sense for accomplishing the objectives of sustaining a healthy and productive forest in an efficient manner.

Comment noted.

Comment 68-3

Could not temporary roads be built that then would be abandoned after the project is completed? This plan would maximize the results as listed in Table 5 for Alternative 1. Is it cost effective to maintain the new roads after the timber is harvested when the next harvesting cycle might not be for 50 years.

The Forest Plan (FEIS p 3-11 to 3-16 and Table 4-12) allows for construction of temporary roads, and some have been used where appropriate. Temporary roads cannot be abandoned when their use is completed; they are required to be returned to resource production within 10 years after the completion of their use.

Typically, it is not cost effective to maintain a road for public access between harvest cycles. Each road is analyzed for recreation, wildlife, fishing, and firewood use. Most new roads are used for timber harvest, then a few years for firewood gathering and deer harvest, and then closed to public traffic and sometimes-administrative traffic. This reduces the maintenance costs associated with the road, allows for the harvesting of the timber, and also opens the area up at least temporarily for recreation and other purposes. We are required to go back to these roads on a periodic basis to ensure that resource damage is not occurring.

Comment 68-4

A question concerning deer damage. Is hunting permitted at ANF? If not, why not?

Hunting is permitted on the Allegheny National Forest.

Letter #69 –Thomas Kase

Comment 69-1

The following are my comments for the East Side EIS:

Comment noted.

Comment 69-2

1. I support the "Need for the Proposal' on pages 2 and 3 of the East Side Draft EIS Summary.

Comment noted.

Comment 69-3

2.I support the harvesting of trees, especially when using even-age management techniques.

Comment noted.

Comment 69-4

3. I support the FS efforts to conduct salvage harvesting. This effort should maximize the volume of dead and dying timber to be harvested, that is economically feasible.

Comment noted.

Comment 69-5

4. I support the use of herbicides to control interfering vegetation.

Comment noted.

Comment 69-6

5.The Forest Service should minimize new road construction and new pit development. Only do what is necessary to access all proposed treatment areas. Use existing roads wherever possible to minimize new acreage taken out of valuable timber production. No roads should be obliterated, they may be useful in the future. Instead these roads should be "put to sleep" with a 'tank trap" at the access point and install waterbars beyond that. Many times these old roads are used by hikers, skiers, hunters, etc. to provide easy access into more remote areas.

Please see the response to Comment 15-11. The decision as to the methodology for "putting a road to sleep" is dependent on predicted resource management from that road in the future. If access is

Comment 69-6 cont.

needed within several years, then waterbarring a road may cause more sedimentation than maintaining the road in its post sale condition. Due to safety concerns, the Forest Service does not use "tank traps". We install earth or rock barricades. People are encouraged to walk into and out of these areas on these corridors.

Comment 69-7

6. Any historic interpretation should include an explanation of the establishment of this second growth forest. It should include the fact that this forest type (Allegheny Hardwood) is unique to the world, and that scientific research done locally on the forest has developed even-age management guidelines to ensure the continuation of this forest type. These interpretive signs should be placed where management occurs along the "critical view facilities" identified in the project, or highly used areas.

Comment noted.

Comment 69-8

7. 1 support the use of even-age silviculture within the project area to establish new stands of trees, thus allowing the sites to remain forested and not become permanent openings in the forest. The 'Forest Service should be moving the 0-20 year age-class toward the Desired Future Condition outlined in the Forest Plan. Allegheny Hardwood forests are unique to the world and need to be maintained using even-age management.

Comment noted.

Comment 69-9

8. 1 do not support using uneven-age silviculture in Allegheny Hardwood stands. These are even-age stands and the Forest Service should not be forcing them to become something they are not. The use of uneven-age management should be concentrated in riparian areas with hemlock to maintain quality cold water fisheries.

See the Record of Decision for an explanation of the rationale for the selection of the preferred alternative.

Comment 69-10

9. 1 support the proposed treatments to be conducted on the Kane Experimental Forest. These plots way provide some insight regarding new management techniques and/or outcomes in areas of high mortality on the ANF.

Comment noted.

Comment 69-11

10. 1 support the proposed thinning of healthy stands to maintain their vigor and provide growing space for the trees remaining. Thinning stands to keep them between 60-80% stocking will also provide for the best habitat for the Indiana bat which may occur on the forest.

Comment noted.

Comment 69-12

11. 1 agree with the decision to conduct salvage thinning within the project area. This will. remove dying trees and provide less competition for sunlight and nutrients to the remaining trees.

Comment noted.

Comment 69-13

12. 1 support proposed reforestation efforts including herbicides, fencing, site preparation, fertilization, and planting.

Comment noted.

Comment 69-14

13. 1 agree with the statement on page 2 of the Draft EIS that "There is a need to provide wood to meet people's demand for wood products.." This is one of the original, primary purposes for the establishment of the National Forest system.

Comment noted.

Comment 69-15

14. 1 support the 1,162 acres of "green treatments" proposed in the preferred alternative.

Comment noted.

Comment 69-16

15. 1 agree with the "Summary of Determinations" on pages 179 and 180 of the Draft EIS.

Comment noted.

Comment 69-17

16. Of the alternatives proposed, I prefer the selection of Alternative 1. This alternative does the best job of moving this area toward the desired future condition designated in the Forest Plan.

Comment noted.

Comment 69-18

Thank you for this opportunity to comment on the management of my National Forest.

Comment noted.

Letter #70 – Henry Hild

See Comment Letter #15 and original letter in Project File. Comments entered are similar to Letter #15.

Comment 70-1

The logging of this area furthers the insidious transformation of the Allegheny into a tree farm -- the antithesis of the wild and unique forest that once stood in that area, still represented by cherished remnants like Heart's Content.

Comment noted.

Letter #74 – Doug Cornet

See Comment Letter #15 and original letter in Project File. All comments are exactly the same except for this additional statement at the top of the letter: "*PLEASE ACKNOWLEDGE RECEIPT OF THIS E-MAIL*"

John Palmer emailed commentor back with acknowledgement (email response attached to original letter).

Letter #76 – Douglas Carlson, Forest County Conservation & Planning Department, Executive Director

Comment 76-1

Please consider the following as my comments for the East Side EIS in regards to forest management on the Allegheny National Forest:

Comment noted.

Comment 76-2

In recognition of the dominance of shade intolerant (or of intermediate tolerance) species, I agree with the decision of the Forest Service to use even-age silvicultural practices in order to improve the health and vigor of the stands in the project area. It is important to maintain current blodiversity balance in the area and this can only be done by repeating the conditions that brought the current stand into existence.

Comment noted.

Comment 76-3

B. I support the statement entitled "Need for the Proposal" on page 2 & 3 of the East Side Drat [SIC] EIS Summary draft document.

Comment noted.

Comment 76-4

C. I fully support all efforts of the Forest Service to further study regeneration techniques on a variety of forest stands. The "Adaptive Management Program" is a good beginning to that effort.

Comment noted.

Comment 76-5

D. I support the proper use and application of herbicides to control the competitive vegetation affecting natural regeneration on the ANF. Proper site preparation is necessary to improve chances of regeneration success. Fencing should be part of the strategy to cause proper regeneration as well.

Comment noted.

Comment 76-6

The proper application of fire to control unwanted vegetation should also be further explored as an effective regeneration tool. Fire was historically instrumental in producing the diverse forest existing on the ANF and the subsequent wide ecological diversity that current resides on the ANF.

Comment noted.

Comment 76-7

E. Without natural examples of uneven-age stands within the project area, I can not support the introduction of that stand age strategy.

Comment noted.

Comment 76-8

F. Considering the current national issue of road building moratorium for National Forests, I would state that the ANF staff has done a better than average job of minimizing new road work as well as stone pit creation on the ANF. I urge that efforts be continued to minimize both road building and pit development but only when it is practical and makes economic sense.

Comment noted.

Comment 76-9

G. There is no forest like the Allegheny National Forest on this planet. It is unique in forest type, tree species distribution dominance and forest species relationships. The unique character of this forest should cause managers to, exert every effort to maintain the uniqueness. The Allegheny National Forest today is literally a , phoenix' having risen from the ashes of the burned over clear-cut harvests of the late 1800's and early 1900's. Those who would advocate the return to the original forest type fail to recognize the valuable and unique ecosystems that live on the forest of today. The mixture of forest tree age classes found on the Allegheny National Forest is the true strength of this revived and recovered forest, The ANF stands above all other National Forests in the nation as far as being a very special unique forest. Only through active management will it remain what it is.

Comment noted.

Comment 76-10

H. Uneven age silviculture practices will not perpetuate the unique tree species composition found on the ANF. The shade intolerant tree species will not remain as dominate in the canopy should uneven age practices be put into play. There is actually forest wide uneven age forest types already. Local uneven age forest stands exist in several areas, such as 'wilderness' designated areas, and riparian areas along the watercourses. Uneven age forest tree classes exist on a area basis with localized even age stands intermixed over square miles into multiple age stand classifications. Strict uneven age management will destroy the character of this forest and forever destroy a perfect opportunity for human beings to study their affect on forest ecosystems over long periods of time.

Comment noted.

Comment 76-11

I. Salvage thinning and only makes sense. Diseased and dying trees should always be removed given the onslaught of introduced insect, bacterial and viral pests. Total pest control is impossible but control should be our goal at whatever level we are able to achieve it.

Comment noted.

Comment 76-12

J. The use of herbicides in the proscribed and correct manner is a valuable management tool that will combat the infestation of fern and non-productive (particularly for wildlife food shrubs) shrubs. The use of herbicides seems to be a viable alternative to fire, and is certainly far more capable of being controlled.

Comment noted.

Comment 76-13

K. Thinning of mature stands must also occur in order to allow regeneration of shade intolerant tree species. Without thinning, shade tolerant species will invade and supplant the current forest type. The current forest type deserves a chance to illustrate the values of human management of forest resources.

Comment noted.

Comment 76-14

L. I admit I question the success of fencing or tree tube protection of planted seedlings but soil preparation through fertilization and disturbance is very important. Control of deer is needed in whatever forms possible.

Comment noted.

Comment 76-15

M. Support for the idea of 1, 162 acres of 'green treatments' ..is only logical.

Comment noted.

Comment 76-16

Support for .. the "Summary if Determinations" on page 179 and 180 is only logical.

Comment noted.

Comment 76-17

N. Consideration of all the alternatives leads me to believe that Alternative I will provide the management level needed to perpetuate the forest type and reach the desired conditions as stated in the draft documentation.

Comment noted.

Comment 76-18

Knowing that there are those who would change our National Forests into something resembling the National Park system, I would urge the ANF to continue serving the original purpose of the National Forests. There is not any compelling evidence that should cause us, as citizens of the Untied States of America, to change those original purposes. In 1897, the Organic Administration Act clearly states, under the Designation and Purposes of National Forests section,

"No national forest shall be established, except to improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of water flows, ***and to furnish a continuous supply of timber for the use and necessities of the citizens of the United States****... "*

As far as I am aware the Organic Administration Act has not been superceded or suspended by any subsequent Act of congress. All subsequent congressional actions have only added considerations and guidance for management of National Forests. Please fulfill the law of the land as per your responsibility as set forth in the Organic Administration Act.

Comment noted.

Comment 76-19

As a conservationist I remain extremely concerned that the unique forest system on the Allegheny National shall be destroyed through the efforts of the ADP preservationists. They are following the untried theories enveloped within the Wildlands Project promoted by Wild Earth and the Cenozoic Society and funded by Heartland, Inc. and the PA Sierra Club. There is little scientific data or study supporting the wide range of assumptions set forth as Wildlands Project policy. The ANF can not be allowed to be destroyed for such an unsubstantial reason. I am particularly concerned over the loss or extinction of certain plant, animal bird species and unique forest community relationships should the current hardwood forest be altered to a dominant old growth Hemlock/Beech forest

Comment noted.

Letter #77 – Casey Brown

Comment 77-1

As a lifelong resident of the Keystone State, I am outraged that our national forest is in danger of desecration and destruction at the hands of the US Forest Service. Pennsylvanians revere their forests and we trust you to make wise, conscientious, environmentally sound and ethical decisions. Our forest is an increasingly rare and ever wondrous place. It is home to birds, and bugs and furry animals. How could you risk their lives by tearing down trees, clearing land, introducing heavy equipment and spraying dangerous chemicals?

Please see the Purpose and Need section of Chapter 1.

Comment 77-2

I object to the East Side Project ..

Comment noted.

Comment 77-3

..and I have collected petition signatures from friends, neighbors, and fellow woodlands walkers who share my horror at the proposed logging of the Allegheny National Forest.

Comment noted.

Letter #78 – Jack Hedlund, Allegheny Forest Alliance, Executive Director

Comment 78-1

A review of the Draft Environmental Impact Statement (DEIS) for the East Side Project has been completed by the Allegheny Forest Alliance (AFA) staff and the following comments warrant consideration.

Comment noted.

Comment 78-2

We agree with the assessment of the ID Team that the "needs for action" listed on pages 2 & 3 of the Summary will "enhance present conditions."

Comment noted.

Comment 78-3

We strongly believe #5 best describes the Forest Service's mission and should be the focal point for "desired future condition." It is both legally and scientifically responsible.

Comment noted.

Comment 78-4

We do not support uneven-age silviculture for Allegheny Hardwood. Scientific research substantiates the wisdom of even-age management for this unique forest type.

Comment noted.

Comment 78-5

We support maximizing salvage of dead and dying timber to the extent that it is economic feasibility.

Comment noted.

Comment 78-6

We support "regeneration/reforestation treatments" (including herbicides, fencing, planting, harvesting, etc.) as being responsible management.

Comment noted.

Comment 78-7

Among the alternatives suggested, Alternative 1 maximizes that responsibility thereby moving the ESP toward the "desired future condition."

Comment noted.

Comment.78-8

We believe late-successional/old growth development plays and integral role in responsible forest management, but can be applied to less productive sections of the management areas. Additionally, maximum standards should be established for old growth to balance existing minimum standards.

Comment noted.

Comment 78-9

We support the Summary of Determination outlined on pages 179 & 180 of the DEIS as being a substantial analysis regarding threatened, endangered and sensitive species.

Comment noted.

Comment 78-10

We support Alternative 1 for best meeting the mission of the forest plan.

Comment noted.

Comment 78-11

The AFA commends the Interdisciplinary Team for its diversity and comprehensive scope of analysis/evaluation and wish to thank the Forest Service for the opportunity to comment.

Comment noted.

Letter #79 – Helen Johns-Richardson

Comment 79-1

I have just finished weeding through your "Summary of the Draft environmental Impact Statement for theEast Side Project." 1. would like to be curt in my comments, but will try instead to be constructive and kind. Allow me this one comment: you are so good at "managing" our forests wily can't you manage to write without all of your lingo and confusing terminology, i.e. "improve the benefits of forests", "vegetative management prescriptions", "transportation systems" etc.etc.?

Comment noted.

Comment 79-2

The main point which I gleaned from the summary, is that your emphasis is on the merchantability of the trees of our National Forest. You say this is because of the people's demand for hardwood and other wood products. I will ask you, what people are, these? Is it the American people, or are you selling our trees to foreign countries where they know nothing about what is happening to our forests. You aren't telling us who buy trees.

This comment is beyond the scope of the East Side project.

Comment 79-3

My emphasis would be on preservation, at all cost, to our National Forests! If there is a demand for wood, let them go elsewhere or educate them to use alternatives to trees. I understand they are now producing plastic wood which can be readily used as a building material. We have all the aluminum, plastic, steel, clay, stone, brick that we need. Hemp and other plants can be grown for paper. Why can't we stop Cutting down our trees???

Please see the Purpose and Need section of Chapter 1.

Comment 79- 4

These then are my bottom lines: NEVER SPRAY HERBICIDES OR OTHER SPRAYS. You are destroying the tiny creators when you do this. (There was no mention of all of our tiny and microscopic creators in your summary.)

Comment noted. See Alternatives Considered but Eliminated From Detailed Study.

Comment 79-5

AND LEAVE ALL PUBLIC FOREST LANDS ALONE, FOR THE CREATORS OF THE FORESTS TO MANAGE. They know what they are doing, are you sure that you do?

Comment noted.

Comment 79-6

PROHIBIT ALL ROADS, LOGGING AND ALL DESTRUCTIVE ACTIVITIES ASSOCIATED WITH ROADS.

Comment noted. See the Purpose and Need section of Chapter 1.

Comment 79-7

It is time we begin to preserve what is left of our forests. (Please see the enclosed leaflet from The National Arbor Day Foundation. They have answers on how to preserve.)

Comment noted.

Letter #80 - Barbara Warner

Comment 80-1

This is to comment of the East Side Timber sale. Please do NOT send us a copy of the DEIS.

Comment noted.

Comment 80-2

This sale is not only environmentally destructive it is monetarily wasteful of tax-payers money. Clear-cuts cause erosion and siltation of streams and destroy the ecology of a region . The harm such extensive and unsustainable logging will do will cost much more to restore than will be made. It is past time that public forests be used for commercial logging as they are much more valuable for their environmental contributions of clean water and air and for recreation than for subsidizing timber companies at the cost to our environment and to our future

Comment noted.

Comment 80-3

This sale must NOT take place.

Comment noted.

Letter #87 - Dr. John Hoson

See Comment Letter #15 and original letter in Project File. All comments are exactly the same except for missing comments #2, 4, 5, 6, 7, and 10 and the wording variation in Comment #12: "We are *'deeply concerned about the use*..

Comment noted.

Letter #89 – Beverly Braverman

See Comment Letter #15 and original letter in Project File. All comments are exactly the same except for an additional comment after comment #1 which states: We the people are bone-weary of these constant assaults on OUR forests. There should be places where the "natives" can exist without the threat of destruction and the sound of chainsaws.

Comment noted.

Letter #95 – David Nickell

Comment 95-1

I know you are receiving many spam-type comments on this sale. I hope you will take this one more seriously.

Comment noted.

Comment 95-2

As a sociologist I am extremely concerned about the use of our public resources--precisely those that future generations will need to maintain a quality of life--are being exploited for the private profits of the few. This is just, in principle, wrong. It is wrong in terms of the quality of life it will leave for the future.

Comment noted.

Comment 95-3

It is even wrong economically, as many studies have shown.

Comment noted.

Comment 95-4

Unless you can demonstrate the actually environmental NEED to harvest within a small tract, I do not believe you can justify your actions.

Please see the Purpose and Need section of Chapter 1.

Letter #98 – Bill McLaughlin

Comment 98-1

See Comment Letter #15 and original letter in Project File. A shortened version with some wording changes entered in its entirety. I am writing to protest the proposed East Side Timber Sale.

Comment noted.

Comment 98-2

See Comment Letter #15, Comment #12,. I am deeply concerned about the use of my public lands and taxpayer money for the liquidations of our trees. It is "wrong to damage" our public lands for private gain.

Comment noted.

Comment 98-3

See Comment Letter #15, Comment #13 (exactly the same). Please hold public hearings for the East Side Project in each of the surrounding major cities (Pittsburgh, Cleveland, Buffalo, Ithaca, New York, Philadelphia, Erie, and Harrisburg). I would like the opportunity to learn more and more effectively contribute to the process.

Comment noted. See Comment 15-13.

Comment 98-4

See Comment Letter #15, Comment #14. Please *"stop killing"* the Allegheny National Forest "*by selecting"* an alternative that calls for zero-cutting, zero herbicide use, and the revegetation of logging roads to a forested condition.

Comment noted. See Alternatives Considered but Eliminated From Detailed Study.

Letter #101 – Michael Chezik, USDI, Regional Environmental Officer

Comment 101-1

The following constitute comments by the Department of Interior on the Draft Environmental Impact Statement (DEIS) for the East Side Project, Allegheny National Forest, Elk, Forest, McKean, and Warren Counties, Pennsylvania. These comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and Fish and Wildlife Coordination Act (48 Stat. 401, 16 U.S. C. 661 et seq.).

Comment noted.

Comment 101-2

The proposed action (Alternative 1) is to conduct salvage harvesting in areas of light to moderate mortality. In addition, timber harvesting and wildlife management activities will occur in stands which are not affected by tree mortality and decline. Within the project area, 8223 acres will be harvested using a variety of treatments, including regeneration harvests (i.e., final harvest treatments) in green and salvage units affecting 3535 acres; intermediate harvests in green and salvage units affecting 4243 acres; and uneven-age treatments in green and salvage units affecting 445 acres. Road construction and reconstruction activities, primarily to support timber harvesting, are also proposed as follows: 15.2 miles of new construction, 16 miles of road betterment, 1.5 miles of road realignment, and 92 miles of road reconstruction.

Comment noted.

Comment 101-3

Affected Environment-

In accordance with the Council on Environmental Quality's (CEQ) "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act," the DEIS should contain a section or chapter specifically devoted to describing the "Affected Environment," as the basis for defining present conditions (without any alternatives being applied) in the study area. The DEIS does not contain such a chapter. All information on the present conditions is incorporated to varying degrees in the section on "Comparison of Alternatives by Resource" (Chapter 2, pages 31-35) and the section on "Environmental Consequences"(Chapter 3). As a result, it is difficult to clearly discern the present condition of the study area and its sensitive environmental components. We request that the final document fully reflect the CEQ recommended format (40 CFR 1502. 10).

Chapter 3 of the DEIS and FEIS incorporate both 40 CFR 1502 (f) and (g). We have found that there is a more logical flow to documents when the reader can read the description of the Affected Environment and then directly move on to the Environmental Consequences section. The Affected Environment section of each resource area was not clearly titled in the DEIS. This has been corrected in the FEIS and the reader will be able to easily distinguish the Affected Environment section of Chapter 3 from the Environmental Consequences section.

Comment 101-4

Endangered and Threatened Species-

Within the project area, eagles have been observed foraging along several of the major streams, including Tionesta Creek, Salmon Creek, Kinzua Creek, Clarion River, Big Mill Creek and Sugar Run. To minimize potential adverse effects to bald eagles, we recommend that no timber harvesting or road construction occur within 660 feet of these and any other water bodies used by eagles for foraging. The purpose of the buffer is to maintain a vegetated zone adjacent to rivers to prevent non?point source pollution (thereby ensuring high water quality and optimal food supply for eagles), minimize disturbance to foraging eagles, and ensure that an adequate supply of perching and roosting trees remains within river corridors.

The East Side Project incorporates all of the terms and conditions from the Biological Opinion to minimize take of bald eagles. Your concern associated with preventing non-point source pollution has been addressed through Forest Plan standards and guidelines (see Forest Plan Amendment 6 in Appendix B of BA for T&E Species on the ANF, Dec. 1998 and Appendix F – Guidelines for Road Design in Proximity to Streams), compliance with Pennsylvania Best Management Practices and monitoring of their effectiveness (see BA for T&E Species on the ANF, Dec. 1998 pp.48-53). In addition, limestone surfacing will be used on all new stream crossings and new road construction within 300 feet of a stream to further reduce any sediment (FEIS Chapter 3).

You have also expressed a concern with minimizing disturbance to foraging eagles. Eagle foraging on these streams is sparse, intermittent, and scattered. About 1 to 5 eagles foraging over 150 –200 miles of stream is an estimate of the intensity of eagle use. Furthermore, traffic along existing roads near these streams is very low.

A third concern is ensuring adequate supply of perching and roosting trees within the river corridors. No roosting sites have been found along these major drainages and perching sites are usually located immediately adjacent to (often overhanging) the stream where no vegetation treatments are planned. Perching sites are plentiful and eagle use is intermittent and scattered. Although very little timber harvest and road construction occur within 660 feet of major streams, we do not have evidence to suggest a "no disturbance" buffer is needed.

As discussed in our letter of October 25, 2000, we looked at proposed harvest units within 660 feet of the streams mentioned in this comment. We found only a minor amount (approximately 10 acres) of overlap. As per your letter of December 1, 2000, you have agreed that the small acreage of actual harvest units is unlikely to result in the "take" of foraging bald eagles.

Comment 101-5

Considering bald eagles are known to forage along several river corridors within the project area, we recommend that surveys for bald eagle nests be conducted within two miles of rivers, streams, lakes and reservoirs prior to conducting timber harvesting or road construction activities in these areas. If any nests are located, relevant terms and conditions (i.e., relating to bald eagle nest site protection) in the Fish and Wildlife Service's (FWS) June 1, 1999, 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 must be applied.

All proposed treatment areas have been surveyed for stick nests during the planning phase and project layout. All known eagle nests are protected in accordance with the Biological Opinion. All major drainages, where treatments are planned, are driven or walked to record any eagle sightings (including any nests). We are confident that no eagle nests exist within 2 miles of any proposed timber harvesting or road construction within the project area. We are committed to continuing to monitor known eagle nests and searching for new nests in future years as project implementation progresses.

Comment 101-6

Given the nature of activities associated with the proposed project, incidental take of Indiana bats is possible within the project area. In many cases, incidental take will be adequately minimized through the application of relevant terms and conditions (e.g., related to timber harvesting) from the biological opinion. However, considering the contiguous layout of several stands proposed for harvesting, the large acreage proposed to be treated, and the proximity of several harvest areas to locations where Indiana bats have been captured or detected, Indiana bat surveys should be conducted prior to implementation of timber harvesting or road construction. Unfortunately, only one of the 57 sites sampled for bats by Dr. Gannon in 1998 and 1999 was located in a stand proposed to be harvested. Therefore, in accordance with Forest Plan direction, and Terms and Conditions 5b, 5c, 5d and 5e (related to Indiana bats) of the biological opinion, mist-netting' should be conducted in suitable habitat within stands proposed to be harvested in the following areas (referenced by map section and location index):

Map Section	Location Index	Number of Sampling site
C	N-6/N-7/O-7/O-6	1
D	J-9	2
	K-8	1
	K-9	2
G	N-13	1
I	G-14	1
	H-14	1
J	D-16	1

The above survey site locations apply to Alternative I (the preferred alternative). If a different alternative is selected, the FWS should be contacted regarding appropriate sampling site locations for that alternative.

During the summer of 2000, forty-six new sites were surveyed for bats by Penn State crews (Each site was surveyed a minimum of 2 nights with 8 to 12 nets set at >2 locations per night). At least 23 of these new sites were within the East Side project area and included the 10 sites recommended. No Indiana bats were captured in mist nests this summer. However, preliminary analysis of the anabat data indicates that Indiana bats were detected at site 49. This site is located within the Tionesta Scenic Area near the intersection of Forest Road 148 and a pipeline right-of-way. Indiana bats were also detected but not caught at this site in 1999. The closest proposed treatment area to this site is approximately 1 ½ miles to the west.

Over a three year period, Penn State bat biologists have surveyed 103 sites on the ANF using the Fish And Wildlife Service protocol and have caught one Indiana bat. In addition, a proposed pipeline project (AM-60) within the East Side Project Area resulted in the need to survey 12 sites for bats. The survey was completed by BHE Environmental Inc. and resulted in no Indiana bats being caught. The total number of sites where mist net surveys were conducted on the ANF over the past 3 years is 115 with only 1 Indiana bat captured. These data have been added to the final East Side Biological Assessment.

Comment 101-6 cont.

A map of the 103 survey sites completed by Penn State University is being forwarded to you under separate cover. The results are being compiled by Penn State University and will be available in December.

Comment 101-7

Due to the capture of an Indiana bat at sampling site 5, and the large number of Indiana bat vocalizations detected there, mist-netting should be conducted prior to implementing activities resulting in timber harvest or tree removal (including road construction) within 1.5 miles of that sampling site. This affects project activities proposed in portions of Map Section H, Location Index L-15, L-16, M-15, M-16 and N-16. It is likely that roost trees, foraging habitat, and perhaps even a maternity colony occur within that radius.

Site 5 was again surveyed twice in 2000. No Indiana bats were caught and preliminary analysis of anabat detections has not revealed the presence of any Indiana bats in 2000. This site has been highly modified by beavers which may have influenced flight patterns of bats using the area. Site 5 was surveyed 3 nights in 1998 and 3 nights in 1999. Surveys have been completed at 2 locations up stream of site 5 (sites 31 and 6), at one site down stream (site 30), at one site in the first major drainage to the west (site 39), and at 2 sites on the first major drainage to the Northeast (Site 74 and 99) (See Map of survey locations referenced in #4 above). No Indiana bats were caught or recorded at any of these adjacent sites. We plan to continue to survey at site 5 in 2001 with the hopes of capturing an Indiana bat and placing a transmitter on it. As we have previously discussed, we will contact you immediately if an Indiana bat is captured or a maternity site located.

Comment 101-8

When mist-netting, it is imperative that the nets be placed at an appropriate height. Most Indiana bats caught in mist nets are captured over streams and other flyways at heights greater than six feet. Where streams and other suitable flyways are present, mist-netting should focus on these areas. In addition, Indiana bats often forage in and immediately above the tree canopy; therefore, nets should be placed well into the canopy where streams and other flyways are not present.

Bat surveys should be conducted by a qualified biologist using the enclosed guidelines. If any Indiana bats are captured during mist-netting, they should be fitted with a radio transmitter and tracked to identify roost trees and foraging habitat. Survey results should be submitted to the FWS's Pennsylvania Field Office for review.

For the third year in a row, bat surveys were conducted by trained biologists under the guidance of Dr. Michael Gannon and Mr. Tim Blackburn (phD candidate). Identification and verification of any captured or detected Indiana bats is done by Michael or Tim. Our staff biologists assisted the Penn State crews on several nights to observe mist net placement and general procedures. Mist net placement followed the Recovery Plan guidelines with nets at every site exceeding seven meters in height. Eight to twelve nets were set at each site, exceeding the minimum guidelines for net nights in the Draft Recovery Plan.

Comment 101-9

Specific Comments

Chapter 2, Page 35, Section on Human Health and Safety and Chapter 3, page 58 (Environmental Consequences):

The study area will be subjected to herbicides (sulfometeron methyl and glyphosate) as a means of controlling vegetation. The report cites experience since 1987 as the basis for dismissing human health and safety concerns related to the use of these herbicides. The section on Environmental Consequences (Chapter 3, page 58) also cites a 1991 analysis of the potential effects of herbicide use on water quality and fisheries (under the assumption that the standards and guidelines in the Forest Plan for protecting water resources was implemented), concluding that no adverse effects on human health and safety were noted. Noting the intended use of these herbicides in the proposed project area, the specific environmental and human health indicators used to reach this conclusion should be identified in the report.

The specific environmental and human health indicators can be found in the FEIS for Understory Vegetation Management on the ANF (1991). The East Side FEIS tiers to the Understory Vegetation Management FEIS (East Side FEIS p.11). A summary of these findings is provided in Chapter 3.

Comment 101-10

Chapter 3, page 119 (Fertilization):

Each action alternative includes aerial or ground application of fertilizers, as a means of stimulating vigorous seedling growth. The potential for enhancing eutrophication of the receiving waters in the project area as a result of the fertilization activities should be discussed.

Additional discussion has been added to Chapter 3 of the FEIS. In summary, Forest Plan standards and guidelines are in place to ensure that fertilizer does not reach streams (Forest Plan p. 4-25). These standards and guidelines were monitored in 1991 and determined to be effective.

Comment 101-11

Chapter 3, pages 61-62 (Table 27):

It would be very helpful under the column "stream crossings" to distinguish between proposed new and proposed improved (i.e., surfaced with limestone) crossings.

Chapter 3, pages 63-64 (Table 28):

It would be very helpful to break the "limestone" miles of proposed roads into the categories of new limestone roads (i.e., new road construction using limestone surfacing) and existing roads to be resurfaced with limestone. Likewise, we recommend breaking the "non-limestone" category into the categories of construction and reconstruction.

This section has been re-structured since the DEIS was written. Tables 31 and 32 display both the existing condition and the condition if each alternative were implemented for direct/indirect and cumulative effects. See pp. 86-105 for discussions of individual watersheds.

Comment 101-12

Chapter 3, pages 51-65 (Water and Watersheds):

Although it appears that some existing roads within 300 feet of watercourses will be resurfaced with limestone to reduce sedimentation, it isn't clear how many miles of new roads are proposed within 300 feet of watercourses. The DEIS indicates that "approximately 66% of road runoff may reach a stream course when the road is within 300 feet" (p. 56). Considering this, and the, existence of 75.3 miles of Forest Service dirt and gravel roads and 99.5 miles of non-Forest Service roads already within 300 feet of stream courses in the project area, we recommend that new roads be located well beyond 300 feet of watercourses to avoid sedimentation and potential adverse effects to aquatic life. We also recommend the decommissioning of existing Forest Service dirt and gravel roads within 300 feet of watercourses to restore and protect water quality and aquatic life.

The number of miles of new roads within 300' of a streamcourse is included in the reformatted tables under each watershed. The only place new roads are proposed within 300' of a streamcourse is 0.4 miles in the W. Branch Tionesta Creek watershed.

The Forest Plan provides standards and guidelines (pp. 4-26 & 4-27) that address new road construction and existing roads within riparian areas or where a filter strip may not be entirely effective. In each case, the Forest Service provides direction when encountering these situations, including a reference to a document titled "Guidelines for Road Design in Proximity to Streams". Where dirt and gravel roads are within 300' of a streamcourse and are proposed for use in the East Side project area, these will be surfaced with limestone as a higher standard for further reducing any sediment runoff. Under Alternative 1, five stream crossings will be obliterated and 1.52 miles of road within 300 feet of a stream will be obliterated.

Comment 101-13

Appendix C, pages 33-34 (Tables 19 and 20); also similar tables in the DEIS:

These tables mingle tree age with percent canopy closure, when age and canopy closure should be presented in different tables. In addition, for each alternative, the tables of percent canopy closure and tree age should include the present condition, as well as various time intervals, not just a projection to year 2019. The time intervals should include at least the following: present condition, immediately post-harvest, 10 years post-harvest, 20-years post-harvest, and 40 years post-harvest.

Appendix C Tables 16 and 17 display the distribution of habitat conditions that will be found in treated stands by the year 2019. The 20 year time window for discussion on vegetative effects was used for all vegetation analysis because it will take that amount of time for several of the treatments to be fully implemented and vegetative response able to be quantified.

Comment 101-13 cont.

These tables provide information intended to show how each alternative affects habitat distribution by the year 2019. We have used the same criteria to define habitat as was used in the December 1998 BA Tables 6 and 7.

To be consistent with descriptions used in the 1998 BA, these tables have been changed.

Comment 101-14

Appendix C, page 34:

We recommend that the Forest Service use its authorities, pursuant to Section 7(a)(1) of the Endangered Species Act, to ensure that the selected alternative results in optimal Indiana bat foraging habitat (i.e., 50-70 percent canopy closure) on at least 35 percent, rather than 27 percent, of the total stand acres. We recommend that this be done by decreasing the number of acres proposed to have <50 percent canopy closure, rather than decreasing the number of acres in the >70 canopy closure range.

Only stands proposed for a regeneration treatment (removal cut, shelterwood removal cut, 2-aged harvest) will result in less than 50% canopy closure. As a result, the only way to decrease the number of acres that have less than 50% canopy closure is to eliminate all "green" regeneration treatments. A maximum of 2689 acres of regeneration cutting are proposed for treatment under Alternative 1 (Table 59 p. 150). Of this acreage, 1603 acres presently provide less than suitable foraging habitat (salvage units with relative density <40%) and 1086 acres are presently considered closed canopy habitat (green units). Dropping the regeneration treatment from stands that presently provide closed canopy conditions, will not result in optimum foraging habitat conditions. Alternative 2 would drop all green units, and only complete salvage treatments. The long term cumulative effect of this approach would be 16 % of the treatments in less than 50% canopy closure and 64% in greater than 70% closure, but the amount of optimal habitat would be the lowest of any alternative (ie. 19%)(Table 17 p. C-36). Alternative 1 maintains 27% of the treatment areas in optimal foraging conditions while maintaining 32% of the treatments in canopy closures exceeding 70%.

Comment 101-15

Thank you for the opportunity to review and comment on this Draft EIS. If you have any questions regarding this matter, please contact Carole Copeyon of the FWS's Pennsylvania Field Office at 814-234-4090.

Comment noted.

Letter #102 – John Schraufrasel

Comment 102-1

I am writing to protest the East Side Project.

Comment noted.

Comment 102-2

Logging must stop on our National Forests! They are to [sic] valuable to log. These forest are better left unlogged so everyone can enjoy their beauty and the forest can keep our water and air clean. The beauty of a forest that has not been logged is priceless.

Comment noted.

Comment 102-3

Please stop this project.

Comment noted.

Letter #103 – Barry Frantz, USDA, Natural Resources Conservation Service, Soil Conservationist

Comment 103-1

This is in response to your transmittal letter dated April 12, 2000, requesting review and comment on a Draft EIS for the East Side Project on the Allegheny National Forest.

Comment noted.

Comment 103-2

Construction, improvement and maintenance of roads and construction and stabilization of skid trails could have a potential major impact to both soil quality in the forest, and to water quality in streams from sedimentation.

Please see the Water and Watersheds, Soils, and Transportation sections of Chapter 3. Also, see Mitigation Measures, Appendix D.

Comment 103-3

Because of the large scale of the project it is not possible to provide a critique for every proposed action in every compartment.

Comment noted.

Comment 103-4

We recommend that detailed plans be reviewed locally with the respective county conservation district, to insure soil and water resources are being adequately protected.

All proposed activities have been reviewed by a Soil Scientist and Fisheries Biologist. See the individual Alternative proposals and Mitigation measures.

Comment 103-5-

Please contact me at (717) 237-2216; barry.frantz@pa.usda.gov if you have questions.

Comment noted.

Letter #104 – Alex Denmarsh

Comment 104-1.

Following please receive my personal comments regarding the USFS East Side timber sale proposal.

Comment noted.

Comment 104-2

Your attention to these comments and a prompt and thorough response to each point raised is expected.

Comment noted.

Comment 104-3

See Comment Letter #15 and original letter in Project File. All comments are exactly the same as Letter #15, Comments #1-12 except additional comments added and some minor wording changes that did not change the context of the letter.

Comment 104-4

The Allegheny National Forest has provided me with numerous recreation opportunities, educational hikes as well as a peaceful place to get away from an urban environment and relax in the forests natural beauty. The ecological and personal value of OUR Allegheny forest for the people of this region and the entire U.S. far out weigh the short term financial gains of a few private corporations.

Comment noted.

Comment 104-5

See Comment Letter #15, Comment #13 (similar). I would like the opportunity to learn more and more effectively contribute to the process. Therefore, because it is required by law that you grant me this opportunity, you must hold public hearings for the East Side Project in each of the surrounding major cities (Pittsburgh, Cleveland, Buffalo, Ithaca, New York, Philadelphia, Erie, and Harrisburg).

See Comment 15-13.

Comment 104-6

See Comment Letter #15, Comment #14 and original letter in Project File. Please support the Allegheny National Forest by selecting an alternative that calls for zero-cutting, zero herbicide use, and the revegetation of logging roads to a forested condition. "*For your children's childrens chance to experience a vibrant planet."*

See the Alternatives Considered But Eliminated From Detailed Study section of Chapter 2.

Letter #120 – Amelia Trevelyan

Comment 120-1

See Comment Letter #15 and original letter in Project File. All comments the same except for minor wording changes that did not affect the context of the comment. Of note, Comment #12 states: I am deeply concerned about the use of my public lands and taxpayer money for the liquidations of our trees "*and wholly opposed to it*". It simply is not right that you are damaging our public lands for private gain.

Comment noted.

Letter #121 – Rachel Martin

See Comment Letter #15 and original letter in Project File. All comments are exactly the same for Comments 1-11. See the added comments for changes and variation.

Comment 121-1

The Allegheny has been a very special place for me for many years, as it is for many other people throughout the region, and indeed, throughout the country.

Comment noted.

Comment 121-2

"*I am greatly disturbed by your failure to hold public hearings on this massive and controversial timber sale."* Please hold public hearings for the East Side Project in each of the surrounding major cities (Pittsburgh, Cleveland, Buffalo, Ithaca, New York, Philadelphia, Erie, and Harrisburg). I would like the opportunity to learn more and more effectively contribute to the process.

See Comment 15-13.

Comment 121-3

I am also disturbed by your failure to respond to all public comments during the scoping process. I've read through the comment file, and feel that citizens who have raised questions and concerns have been illegally and reprehensibly ignored.

See the Issues Used to Formulate Alternatives section of Chapter 1 and Appendix A.

Comment 121-4

I am also concerned about your failure to extend the comment period. 45 days is simply not enough to provide menaingful [sic] comment. The DEIS and maps are lenthy [sic] documents, and the East Side Project File, incorporated by reference, was NOT made readily available. There was no way that the average citizen, one who has another job and a family, could analyze all the data within the comment period given.

Please see Comment 8-114.

Comment 121-5

All of your failures to address the concerns of citizens who OWN THE FOREST make one question whether the Allegheny Forest Service is truly concerned with public comment. One can only assume that the answer is no.

See Comment 121-3.

Comment 121-6

I truly cannot understand how you can in good conscience mislead the public into believing that your primary concern in theis [sic] timber sale is forest health and wildlife, ignore the concerns of the public, work to convert yet another 8,500 acres into a black cherry monocultural. The Allegheny National Forest should be managed as a native forest -- not a tree farm. It makes me truly sad to think of the next generation visiting the Allegheny and seeing only cherry and deer.

Comment noted.

Comment 121-7

See Comment Letter #15, Comment #14 and original letter in Project File. Please "*protect*" the Allegheny National Forest by selecting an alternative that calls for zero-cutting, zero herbicide use, and the revegetation of logging roads to a forested condition. "*For once, please consider the ecology and our health, not your slush funds*."

Comment noted.

Letter #127 – Joseph Martin

Comment 127-1

I and many others support "Zero Cut" on National Forest's or The National Forest Protection and Restoration Act.

Comment noted.

Comment 127-2

I don't support giving international forest companies welfare to come into a rural areas and take the national resources, and leave the rural area jobless again, and again. Tourism, and recreation is where the jobs are for the future of our A.N.F., and all national forests across the country. N.F.P.R.A. would create jobs in the restoration of the forest. It would help townships, and local school districts in stabilizing payments, also it would promote alternative fibers like hemp, kenaf, straw bale etc.

Comment noted.

Comment 127-3

Also, please don't spray any chemicals such as herbicides etc.

Comment noted.

Letter #128 – Paul Brown

Comment 128-1

Forests are dynamic ecosystems that are continually changing. I refuse to subscribe to the theory that they need to be logged in order to regenerate.

Comment noted.

Comment 128-2

I oppose the proposed East Side timber sale which will result in the logging of 8,666 acres of forest land and the reconstruction of 125 miles of logging roads.

Comment noted.

Comment 128-3

This proposal will only further fragment the Allegheny National Forest.

Comment noted.

Letter #129 – Allegheny Defense Project

Comment 129-1

Attached are the Allegheny Defense Project Inc.'s public comments on the East Side Draft Environmental Impact Statement as requested in the April 12, 2000 cover letter for East Side mailing. We believe for numerous reasons, as should the U.S. Forest Service, that the Zero-cut action alternative should be selected for this project. Please respond to each of our comments individually as we have a number of questions. Thank you for this opportunity to comment.

Comment noted.

Comment 129-2

In addition to our comments, 149 citizens have signed a petition in protest of the East Side Timber Sale. We have enclosed the petitions in question. As you can see, Americans overwhelmingly demand that the East Side Timber Sale be withdrawn. There is overwhelming support for an Alternative in the Draft EIS that calls for Zero-cutting within the East Side Project Area. This is consistent with the over 70% of Americans that oppose any logging on our national forests. It is your job to manage the Allegheny National Forest for the net public good. When most of America is demanding that logging on our national forests stop, to move forward with the East Side Timber Sale (the largest timber sale in the Eastern United States) is unconscionable.

Comment noted.

Comment 129-3

Due to your refusal to extend the public comment period, We were not able to fully complete our public comments on time. We have had repeated dialogues with you on this matter. Therefore, we were not able to fully cleanup, spell check, and format these comments as we would have liked. We are left with little choice but to complete our comments after the close of the public comment period.

Comment noted.

Comment 129-4

There is a very important point that we would like to make up front however. In the East Side Draft EIS you determine that an alternative that calls for Zero-cutting in the East Side Project Area is beyond the scope of the East Side Project because, as you say, it is a "national issue." First of all, the East Side Project, which is the largest timber sale in the entire eastern United States is a national issue. Secondly, we do not see how an alternative that looks at zero-logging within the Project Area could possibly be beyond the scope of the analysis. The Forest Service must by law revisit the East Side Draft EIS and fully develop the requested Zero-cut Alternative.

See Alternatives Considered But Eliminated From Detailed Study on p. 34.

Comment 129-5

Lastly, Federal Judge William Standish ordered the Forest Service to consider, in detail, an uneven-aged management alternative. Yet, the Forest Service fails to do this. It is dismissed from detailed study under the premise that, as you claim, it is not feasible. You can not justify your conclusion that it is not feasible without exploring the Uneven-aged management alternative in detail. This includes projecting outcomes for such an alternative. The failure to pursue this legal mandate constitutes a direct violation of an Order of the U.S. Courts. Your malfeasance is inexcusable.

See Alternatives Considered But Eliminated From Detailed Study p. 29. See the Feasibility of Uneven-aged Management section of Chapter 3, p. 148. Also, see Appendix B pp. B-15 to B-17 and Appendix F.

Comment 129-6

Thank you for this albeit limited opportunity to provide comment. We do appreciate the opportunity to be involved in decisions regarding our public forests. But being involved is also our right and that right has been harmed by the way you have handled this process. Therefore we are forced to submit these comments under protest. We protest your refusal to act reasonably when faced with requests from the public. We protest your failure to extend the public comment period, to hold public hearings, and to fully develop the Zero-Cut Action Alternative as requested. You also failed to fully develop the No Action Alternative as required by federal law. For all of these reasons, and more, we protest your handling of the East Side EIS process.

Comment noted. The process used for the East Side project complies fully with all laws and regulations. See Alternatives Considered But Eliminated From Detailed Study p. 34 for the discussion of the Zero Cutting alternative. See chapter 2 p. 28 for a description of the No Action alternative. Site-specific outcomes for each stand are displayed in Appendix B, Table 24. Also, please refer to the discussion of No Action in each of the resource sections of Chapter 3.

Comment 129-7

On behalf of the Allegheny Defense Project, Inc. (hereinafter, "ADP") and our Supporters, we are providing the following public comments on the East Side Project proposed for the Allegheny National Forest (hereinafter, "Allegheny"). The project area for this timber sale comprises approximately 140,000 acres of Allegheny land and thousands of acres of private land. We request that you address our comments individually and specifically in regard to the East Side Project. In order to facilitate your ability to digest these public comments and provide valuable, credible, and informational responses we have provided a table of contents and we have categorized and numbered the comments -- please refer to these numbers in your response.

All comments received during the 45 day comment period for the Draft Environmental Impact Statement are answered in Appendix G of the FEIS.

Comment 129-8

Please respond to any informational requests within a reasonable time period.

All informational requests have been addressed.

Comment 129-9

Please alter, cancel, or select the No Action alternative for the East Side Project proposed action to incorporate these public comments.

See the Record of Decision for the rational for selecting the Preferred alternative as well as the reasons for not selecting the other alternatives.

Comment 129-10

This comment letter totals xxx pages in its length. If for any reason you have received less than xxx pages please contact us without delay and we will provide you with the missing pages. In addition we have submitted these comments via e-mail for your convenience. If you need clarification of any issues raised please contact us immediately. Any failure to contact us can only be construed that the comment letter has been received in its entirety and that you have had no difficulty in interpreting our comments. We are readily available.

A total of 116 pages were received and appears to be complete. No clarification has been necessary with one exception. A reference to Attachment #7 was made in letter No. 129. Carl Leland contacted the Allegheny Defense Project by telephone on August 2, 2000 requesting a copy of attachment #7. No response was received.

Comment 129-11

Dr. Steven Horsley, a plant physiologist for the United States Forest Service (hereinafter, "Forest Service") plainly demonstrates the absurd propaganda that the Forest Service has put forth in regard to the East Side Timber Sale. Mr. Horsley offers this poor argument during a media tour of the East Side Timber Sale:

> "If we do nothing in an unbroken forest for a long, long time, it will no longer be desirable for habitat."
> Dr. Steven Horsley, Biostitute, U.S. Forest Service

Dr. Horsley was misquoted. He was talking about changing habitat conditions over time and was saying that if you do not do anything in an unbroken forest for a long time, then the habitat will not be suitable for certain residents of the forest community, particularly those dependent on early successional habitat.

Comment 129-12

Mr. Horsley's statement did not top the list of mis-information spewing from the mouths of Forest Service representatives though:

> "We've been working all along with the Game Commission and Penn State (University) to find the hibemaculum (where the [Indiana] bats hibernate in the winter). It's a cave or a mine typically, but it could also be in attics of abandoned houses."-
> Kathy Frank, PR Specialist, U.S. Forest Service

Indiana bats do not hibernate in houses. The Forest Service has an obligation to provide honest and accurate information to the American public. This type of mis-information is unquestionably irresponsible. Unfortunately, however, this is not an incident that can be isolated to just a couple of quotes. Mis-information and misleading information have been ongoing problems that are rooted deeply in the propaganda of the Forest Service.

The Forest Service goes to great lengths to ensure that communications with the media are accurate and complete. However. Sometimes information is misunderstood, misquoted, or taken out of context. The intention was to convey that bats hibernate in caves or abandoned mines during the winter but move to other sites to roost during the summer months, which for nursing females can include structures like attics and barns.

Comment 129-13

Another big propaganda ploy of the Forest Service is to predict all doom if they do not themselves clearcut the forest:

> [Forest Service spokeswoman Mary] Hosmer said delaying the timber sale could close a window of opportunity the foresters need to save smaller seedlings that are already in place. If all goes as planned, today's seedlings could be 20 to 25 feet high in seven years, Hosmer said.
> "If we don't do that, we won't get another forest back out there in the ground," Hosmer said. –
> Joe Mandak, Pittsburgh Tribune-Review, June 17, 1997.

See the discussion of the effects of the No Action Alternative p.169. See direct/indirect effects discussion pp. 149-180. See Appendix B Table 24 for site-specific outcomes for each stand.

Comment 129-14

This baseless doom and gloom prediction is repeated as late as February of 1999:

> The volume of timber generated by the East Side Project will probably be about half what it was originally, thanks to a court ruling that delayed most of the project (first dubbed "Mortality II") for two years.
> And spokesman Dale Dunshie estimated that the project ... would generate from 20 to 30 million board feet of timber. Jim Kleissler, forest watch coordinator for the Allegheny Defense Project, estimated that 50 or 60 million board feet of timber would have been harvested under the original Forest Service proposal. ...
> Dunshie explained that dead trees that were merchantable when the project was proposed in 1997 under the name "Mortality II" have "deteriorated to the points where they are no longer viable."-
> Bradford Era, Thursday, February 11, 1999

Dale Dunshie was using mis-information in the form of a doomsday prediction to mislead the public about the scope of the East Side Project. The East Side Draft EIS shows that it was the Allegheny Defense Project that had a better grip on the facts than the Forest Service did. This kind of propaganda campaign that the Forest Service has carried out is both unethical and an illegal obstruction to public participation.

Comment 129-14 cont

Comment noted. The Mortality project is only a portion of the East Side project. The estimated timber volumes displayed in Chapter 2 are generated by Silvicultural examinations for all of the proposed treatment areas. The actual volume will not be determined until individual timber sales have been prepared. There has been a continuous loss of merchantable timber volume and value since the onset of the mortality and decline that continues to occur within the mortality zone.

The East Side Project includes many of the treatments originally proposed in the Mortality II project, as well as treatments proposed in four other projects (Coal Mine, Thomas Rock, Rocket John and FR 446). Modification of treatments from what was originally proposed in the Mortality II project are due primarily to changes in stand condition that have occurred over time. The increase in volume is a result of adding the four additional project areas

Comment 129-15

Yet another tactic used by the Forest Service is to put words in the mouths of logging critics. This is a blatant attempt to discredit our concerns. I think it comes down to a matter of philosophy," he said. "They don't accept the multiple-use concept adopted by the national forests in 1960." Dale Dunshie, September 17, 1996. This statement is curious indeed since we have made the repeated criticism that one of the biggest problems with logging on the Allegheny National Forest is that it violates the multiple-use concept enacted in 1960. In the name of getting the cut out the Forest Service consistently ignores impacts to recreation and wildlife.

Comment noted. See the Purpose and Need section of Chapter 1. Also see the proposed resource activities in Chapter 2.

Comment 129-16

The Forest Service's lies are rampant. For example, whenever the ADP has pointed out that the Forest Service is not implementing all of the terms and conditions of the June, 1999 Biological Opinion (hereinafter, "BO") issued by the US Fish and Wildlife Service on threatened and endangered species on the Allegheny, the Forest Service counters by making the blatantly false statement to the contrary:

Quote from Dale Dunshie

Quote from Dale Dunshie

No quote from Dale Dunshie was printed in the commentors letter.

Comment 129-17

These statements are completely and entirely false. The Forest Service is not implementing, for example, requirements that they enforce mandatory Best Management Practices for high quality watersheds on all watersheds within the Allegheny. This Term and Condition from the BO is not incorporated in either the Forest Plan Amendment for Threatened and Endangered Species or the illegal ANF Conservation Program approved in December. This type of lie is a constant for the Forest Service. But we will not tolerate it. Regardless of your reasons, propaganda and lies to the public that downplay the impacts of the East Side proposed action are designed so that they discourage public participation. This is a violation of the requirements of the federal implementing regulations of the National Environmental Policy Act (hereinafter, "NEPA") at 40 CFR 1506.6.

The ANF produced a Forest Plan in 1986 that includes standards and guidelines for controlling non-point source pollutants in all streams on the ANF. Some of these were amended in 1996. The BMPs of the State and of the ANF are similar, but are worded differently in most cases. However, the objectives are the same, which is minimizing the introduction of non-point source pollutants to nearby stream courses.

See Mitigation Measures in the Water and Watersheds section for a discussion of best management practices, p. 105. All Terms and Conditions from the BO were incorporated into the FEIS for Threatened and Endangered Species on the Allegheny National Forest.

Comment 129-18

When citizens do get involved the Forest Service tells them that they are ignorant and wrong. For example, in a letter sent to a number of concerned citizens the Forest Service began with the following statement:

> Thank you for taking the time to share your strong feelings and concerns about the East Side project. In your letter, you say we should protect our National Forests by ending all commercial timber sales, stopping road construction, removing existing roads, and eliminating pesticides/herbicides. The East Side project is designed to do just what you advocate -- protect and perpetuate our forests -- while responding to significant mortality throughout a portion of the Allegheny. –
>
> John Palmer, U.S. Forest Service

This statement is absurd and offensive. The Forest Service's response to criticism is predictable arrogance. By proclaiming any criticism of the project as ignorance, the Forest Service allows themselves (SIC) to effectively ignore public comment. This has been a problem from the start with the East Side Project.

The East Side fact letter was sent out to provide accurate information for the public to make informed decisions on projects covered in the draft EIS.

Comment 129-19

In another letter you told Dr. David L. Haberman, a professor at Indiana University of Pennsylvania, that $13 million in revenue was returned to the U.S Treasury in Fiscal Year 1997. This statement is false. Most, if not all, of these funds were diverted into side accounts to either mitigate against the impacts of logging (e.g. Knutsen-Vanderberg), or to fund future logging projects (e.g. Salvage Fund). We have submitted a separate FOIA request asking you to produce all documents supporting your claims.

In that same letter to Dr. Haberman you made a number of false statements. Dr. Haberman had made statements in regards to the fact that the Forest Service was attempting to cut 66 million board feet of timber. This figure came from materials produced by the ADP - calculated based upon the best available information. The Forest Service, then, without any basis, told Dr. Haberman that "we expect 20-25 million board feet in 25 to 30 scattered projects across on area of 141,000 acres." Coincidentally, the East Side Draft EIS states that at least 64 million board feet of timber will be cut and removed from the Allegheny. And that does not include timber removed from road construction and other wildlife activities. The result will be more than 66 million board feet of timber being removed from the Allegheny - exactly what we originally calculated. How could the Forest Service make such erroneous assumptions? The only explanation is that the Forest Service is intentionally trying to mislead the public.

This comment is beyond the scope of the East Side EIS. An explanation of the distribution of timber sale revenues will be made available upon request. See Chapter 2 of the EIS for timber volume estimates by alternative. The volume estimates used in the letter mentioned in this comment were for first entry only and were further refined during the planning process.

Comment 129-20

When the Forest Service proposed the East Side project in its original "Mortality II" form, they disregarded comments that there were insufficient alternatives and that the project required an Environmental Impact Statement (hereinafter, "EIS") pursuant to the NEPA. It took a federal Judge in Pittsburgh to set the Forest Service straight. That Judge specifically noted in his decision the content of public comment and how it clearly significant environmental controversy as meant under the NEPA.

Comment noted.

Comment 129-21

Following Judge Standish's 1997 decision, the Forest Service immediately set to work on the East Side Draft EIS. In April of 1998 the Notice of Intent to do an EIS was published in the federal register. Hundreds of public comment letters poured into the Forest Service's offices. These letters were greeted with the same arrogance noted above. Many citizen's unique and specific comments were categorized as "generic" and filed into a folder labeled 11generic."The Forest Service then sent erroneous and misleading letters to commentors claiming that information (that has been demonstrated to be more accurate than previous Forest Service information) was "incomplete", "erroneous", and "misleading." Even though the information that the Forest Service appeared to be questioning was information being distributed by the ADP, we were never approached by the Forest Service about this. Instead, they made false libelous accusations about the information that we were distributing. We obtained copies of these letters second hand and demanded an explanation. None was given.

Comment 129-21 cont

No file name "generic" exists in the Project File. A group of letters containing identical comments was placed in a file named "form letters". All comments whether individual or identical to others were considered during the Scoping process when issues were identified.

Comment 129-22

The Forest Service has refused countless requests to cancel the East Side timber sale, to explore zero-cutting alternatives within the East Side Draft EIS, to extend public comment periods, or to hold public hearings. Nearly all of your responses (SIC) to public comment contained some form of this arrogant statement:

> Thank you for taking the time to share your strong feelings and concerns about the East Side project. In your letter, you say we should protect our National Forests by ending all commercial timber sales, stopping road construction, removing existing roads, and eliminating pesticides/herbicides. The East Side project is designed to do just what you advocate -- protect and perpetuate our forests -- while responding to significant mortality throughout a portion of the Allegheny.
>
> --John Palmer, U.S. Forest Service

The East Side fact letter was sent out to provide accurate information for the public to make informed decisions on projects covered in the draft EIS. All applicable laws and regulations were followed during the NEPA process for the East Side project.

Also, see comment 129-18.

Comment 129-23

The Forest Service is a rogue agency with no regard for whom they are supposed to work for - the American public. Poll after poll after poll finds that Americans want an end to all commercial logging on our national forests. Yet the Forest Service continues to do the opposite - to cut our national forests at alarming rates. The East Side Timber Sale, which is the largest timber sale on any of the national forests in the eastern United States, is the perfect example of how far the Forest Service will go and how many citizens they will ignore all in the name of getting the cut out.

Comment noted. Please the Purpose and Need section of Chapter 1.

Comment 129-24

We sadly present these comments on the proposed East Side Project. We do this sadly because this massive East Side clear-cutting project poses such a serious threat to the ecological integrity of the Allegheny in a project area comprising occupied habitat for 19 threatened, endangered, and sensitive species! It is revolting that the Forest Service has manipulated each and every stage of this process to avoid actually doing anything to protect the flora and fauna of the Allegheny.

Suitable habitat and effects on PETS species are evaluated in the BA (Appendix C). A summary determination of effects can be found on page C-42 of the BA. Also, see the Wildlife section of Chapter 3 of the EIS.

Comment 129-25

For example, for over 5 years the U.S. Fish and Wildlife Service (hereinafter "USF&WS") has been asking the Forest Service to make Best Management Practices for watersheds mandatory conditions within the Allegheny National Forest Land and Resource Management Plan (hereinafter, "Forest Plan"). In their June 1999 BO on the bald eagle (Haliaeetus leucocephalus), Indiana bat (Myotis soldalis), northern riffleshell mussel (Epioblasma torulosa rangiana), and clubshell mussel (Pleurobema clava), the USF&WS ordered the Forest Service to make this change. Since February of 1999 the Forest Service has allegedly been producing an amendment to the Forest Plan that would incorporate the mandatory terms and conditions of that BO. The Forest Service has proceeded with 20 timber sales (and released another 22 for public comment) under the assumption that these sales would in fact comply with the terms and conditions of the BO. On March 1, 2000, the same day that they released 15 timber sales for public comment (all of which state that "The BO provided terms and conditions which must be met during project implementation..."), the Forest Service also released their Draft EIS for threatened and endangered species on the Allegheny. That Draft EIS states in no uncertain terms that the BO's terms and conditions regarding water quality that "The Forest Plan shall be revised to state that the standards and guidelines intended to protect water quality are mandatory and minimum requirements." According to the Forest Service, inexplicably, this mandate "Does not require Forest Plan amendment." Please explain how this clear mandate does not require Forest Plan amendment (SIC).

Comment 129-25 cont.

With implementation of Forest Plan Amendment 6 (December, 1996, Forest Plan Standards and Guidelines related to water quality have been implemented across the Forest. As a result, with the mitigation measures incorporated into the FEIS (Appendix D – Mitigation Measures) Pennsylvania's water quality standards will be met (Chapter 3, pp. 51 and 105). Additionally, the FEIS for Threatened and Endangered Species on the ANF, which was signed on July 28, 2000, revises three existing Standards and Guidelines and adds 12 new guidelines. These changes in Forest Plan Standards and Guidelines have been incorporated into the East Side EIS. Also, see comment 60-101 in Appendix F of the FEIS for Threatened and Endangered Species on the Allegheny National Forest.

Comment 129-26

For five years the USF&WS has asked the Forest Service to do a simple thing -- make Pennsylvania Best Management Practices for stream protection mandatory. The Forest Service then let citizens go on under the impression that this issue would finally be resolved. Now we find out that the Forest Service has planned to ignore the USF&WS all along. Today we find out that not only is the Forest Service not going to aggressively pursue actions to recover threatened and endangered species, but they are going to ignore federally sensitive species and roll back the protection provisions included in the BO. These actions are unmistakably irresponsible management for any national forest. These comments on the East Side Draft EIS document, in excruciating detail, the massive scale of Forest Service deceit that has plagued this process from the beginning. Once again the Forest Service has opportunity to remedy their behavior without requiring citizen action such as protest or litigation. We hope that this time the public is not disappointed as has been the case in the past.

The Forest Service has followed all appropriate laws and regulations in the development of the East Side project. The Forest Plan has been amended twice on matters pertaining to water quality, adhering to appropriate laws and regulations: Forest Plan Amendment 6 (December, 1996) revised standards and guidelines to meet or exceed those established by the State of Pennsylvania and Forest Plan Amendment 11 revised 3 S&G's and adds 12 new S&G's for T&E species

With implementation of Forest Plan Amendment 6 (December, 1996, Forest Plan Standards and Guidelines related to water quality have been implemented across the Forest. As a result, with the mitigation measures incorporated into the FEIS (Appendix D – Mitigation Measures) Pennsylvania's water quality standards will be met (Chapter 3, pp. 51 and 105). Additionally, the FEIS for Threatened and Endangered Species on the ANF, which was signed on July 28, 2000, revises three existing Standards and Guidelines and adds 12 new guidelines. These changes in Forest Plan Standards and Guidelines have been incorporated into the East Side EIS.

Also, see response to Comment 129-25.

Comment 129-27

In the March 2000 Revised Biological Evaluation (hereinafter, "BE") for the Eagle Mills timber sale, the Forest Service states that "The closest known [Indiana bat] hibernaculum to the ANF is at Canoe Creek State Park near Altoona, about 75 miles southeast of the ANF." The Biological Assessment (hereinafter, "BA") for the East Side Project (Appendix C of the East Side Draft EIS) states that "The abandoned mine at Canoe Creek State Park ... contains the largest known hibernaculum of Indiana bats in Pennsylvania."

However, in February of 2000 the Pennsylvania Game Commission (hereinafter, "PGC") discovered a new colony of hibernating Indiana bats along the border of Armstrong and Butler Counties. This Indiana bat hibernaculum was confirmed to include at least 67 individuals, already making it the second largest known hibernaculum in the commonwealth. However, only 3 to 5% of the area of the hibernaculum has been surveyed -- suggesting that it may in fact contain a much larger population of Indiana bats than the Canoe Creek mine. In addition, this hibernaculum lies only 50 miles from the Allegheny, which is significantly closer than the hibernaculum at Canoe Creek. This is clearly significant new information that needs to be assessed before approving any new or older projects, including the East Side Project!

But that is not the limit to the new information that needs to be considered within the scope of the East Side Project. In addition to the discovery mentioned above, two other winter Indiana bat hibernacula were discovered over this past winter in Pennsylvania. There needs to be an extensive analysis that includes these new findings before the East Side Project can continue any further.

In a March 29, 2000 letter from USF&WS Supervisor Carole Copeyon to Lori Odenthal of the Pennsylvania Department of Environmental Protection (hereinafter, "DEP"), it is outlined that the USF&WS deems this hibernaculum to be so significant that they strongly urge the DEP to reject a permit for a coal strip mine to be operated nearby:

Comment 129-27 cont.

Based on the information currently available, the proposed project will adversely affect Indiana bats, thereby affecting the continued existence of this species. To protect this population of Indiana bats and prevent noncompliance with your regulations and the Endangered Species Act, the Service recommends that the permit be denied.

It is clear that the USF&WS considers this discovery to be a highly significant development in the endeavor for Indiana bat recovery. This is new information since the June 1999 publication of the USF & WS's BO for threatened and endangered species on the Allegheny. Again, it is clear that this new information needs to be fully assessed and comprehensive surveys of the hibernaculum need to be completed before the Forest Service approves any new or older projects. The East Side Project should be wholly withdrawn, at least temporarily, on the basis of this new information alone.

At the time the DEIS was prepared, the closest known hibernacula was 75 miles southeast of the ANF (Appendix C, pp. C-8 and C-9). More recently , a new hibernacula, located approximately 50 miles from the ANF was discovered. The Final EIS has been updated with this information. However, it was already assumed that the project area provided occupied Indiana Bat habitat (Table 1 in Appendix C of the FEIS) and as a result, this new information does not require additional analysis as suggested. Additionally, consultation with the USFWS has been on-going since implementation of the BO in June of 1999 and additional recommendations and survey work have been included in the FEIS.

Comment 129-28

In their BO, the U.S. Fish and Wildlife Service considered only impacts between now and the close of 2003. The Forest Service, however, has moved to implement actions as far in the future as 2008. Consider the following from the East Side Project File:

> "The following assumptions help define year of origin based on planned sale and harvest activities. Assume the first entry regeneration harvests will be sold in FY 2000, and most of these final harvest cuts will be completed in FY 2001 in order to recover as much value as possible before it deteriorates. For the second entry final harvest cuts use 2008 as the stand year of origin... "
>
> East Side EIS: Rationale for Calculating Stand Outcomes (Project File)

Therefore the East Side EIS moves to approve actions as far off as Fiscal Year 2008. The Forest Service, however, has not performed a Biological Assessment covering beyond fiscal year 2003 on a programmatic level on the Allegheny. More than likely, such an assessment would then require formal consultation with the U.S. Fish and Wildlife Service. In the meantime, the Forest Service can not approve any projects that might be implemented beyond Fiscal Year 2003.

The US Fish and Wildlife Service amended the Biological Opinion in a letter dated June 1, 2000. It contains the following statement: "The incidental take statement in the biological opinion is hereby amended 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".

Comment 129-29

The purpose for any project on the Allegheny is to move from the Existing Condition (hereinafter, "EC") to the Desired Future Condition (hereinafter, "DFC"), terms the Forest Service commonly refers to in their timber sale plans. The Forest Plan for the Allegheny establishes the DFC which site-specific projects are designed to achieve. The DFC is based upon goals, objectives, and standards and guidelines determined in the Forest Plan. The Forest Plan objectives are set by volume. The Forest Plan sets an objective of 77-80 million board feet (MMBF) average annual cut for Management Area (hereinafter, "MA") 3.0 on the Allegheny. Approximately 82% of the East Side Project falls into MA 3.0. The DFC is a largely even-aged stand composed of the artificial 'Allegheny Hardwoods Forest Type," especially the commercially valuable, but non-climax and mid-successional black cherry (Prunus serotina). It follows that to create an even-aged forest of non-climax tree species, one must practice intensive evenaged (SIC) forest management methods as the Forest Plan, in fact, directs. Table I demonstrates this extreme bias towards even-aged management as dictated by the ecologically disastrous DFC.

Table 1. Even-aged timber cutting vs. uneven aged timber cutting on the Allegheny National Forest 1986-1997. Source: Allegheny National Forest Monitoring Reports 1986-1997.					
Year	**Acres cut even-aged**		**Acres cut uneven-aged Total** (2		**acres**
1986	8,374	(100%)	0	(0%)	8,374
1987	7,967	(98%)	169		8,136
1988	7,657	(99%)	58	(1%)	7,715
1989	8,128	(98%)	169	(2%)	8,297
1990	10,793	(96%)	481	(4%)	11,274
1991	8,452	(86%)	1,408	(14%)	91860
1992	6,716	(88%)	940	(12%)	7,656
1993	4,853	(88%)	659	(12%)	5,512
1994	6,286	(87%)	924	(13%)	7,210
1995	4,253	(85%)	765	(15%)	5,018
1996	6,705%-	(95%)	334	(5%)	7,039
1997		(93%)	299	(7%)	4,578

These Forest Service quotes demonstrating the single-mindedness toward management for the DFC follow:

> The fundamental purpose of any project is to propose actions which move the area from the existing condition (EC) towards the desired future condition (DFC) as described in the Allegheny National Forest Land and Resource Management Plan (Forest Plan).
>
> John Palmer, Forest Supervisor
> East Side Project Environmental Impact Statement
> Scoping Notice April 21, 1998

> The purpose of Duck Sheriff project is to implement Forest Plan direction while addressing site specific needs and opportunities.
>
> John Schultz, Bradford District Ranger
> Duck/Sheriff Project Environmental Impact Statement
> Scoping Notice February 1, 1999

> The purpose of this project is to implement Forest Plan direction in the Duck/Sheriff project area by addressing site-specific needs and opportunities to move the project area from the existing condition towards the DFC.
>
> Duck/Sheriff Draft Environmental Impact Statement
> Chapter 1: Purpose of and Need for Action

> The fundamental purpose of any project is to propose actions which move the area from the existing condition (EC) towards the desired future condition (DFC) as described in the Allegheny National Forest Land and Resource Management Plan (Forest Plan).
>
> East Side Draft Environmental Impact Statement,
> page I April, 2000

From these four passages, one can see that the direction given in the Forest Plan is quite significant in terms of determining what types of site specific actions are taken. Therefore it is imperative that the direction in the Forest Plan itself does not compromise the viability of species that inhabit the Allegheny. When the Forest Plan was originally conceived, the Indiana bat was not confirmed to exist on the Allegheny. Under this premise of absence, the Forest Plan approved a direction for management that emphasized commercial production of trees, particularly production of the naturally rare black cherry, throughout much of the Allegheny. That direction for the selected alternative is characterized on Page 4-94 of the Forest Plan EIS. Table 2 gives an overall image of the forest conditions that would be created by age-class under existing Forest Plan direction.

Table 2: Desired Future Condition as Expressed on Page 4-94 of the Forest Plan EIS.

Year	0-30	31-50	%<50	51-70	%51-70	71-90	>90	>70Years	%>70
1986	16,000	24,000	9.0%	202,000	45.3%	175,000	29,000	204,000	45.7%
2016	126,000	17,000	33.7%	23,000	5.4%	125,000	133,000	258,000	60.8%
2036	131,000	73,000	48.1%	17,000	4.0%	24,000	179,000	203,000	47.9%
2136	126,000	99,000	53.1%	65,000	15.3%	36,000	98,000	134,000	31.6%
Desired Future Condition	126,000	99,000	53.1	65,000	15.3%	36,000	98,000	134,000	31.6%

As can be seen, under the Forest Plan direction, the conditions on the Allegheny would make a major shift toward a young-tree dominated forest. In fact, whereas more than 90% of the Allegheny was older than 50 years of age in 1986, the Forest Service intends to eventually reduce the > 50 years of age component to less than 47% of the Forest. Unbelievably, the DFC as declared in the Forest Plan is a forest that is dominated (53% of the area) by even-aged stands of less than 50 years of age! This shift in age-classes would result in major impacts to wildlife such as the federally endangered Indiana bat. Nevertheless, neither the Draft EIS for the East Side Project, or the Draft EIS for threatened and endangered species on the Allegheny for that matter include any discussion of the possible negative effects to sensitive flora and fauna of pursuing the DFC. These analyses are insufficient for this reason.

Despite the risks to wildlife, the Forest Service has proposed no change in the DFC as declared in the Forest Plan. In fact, the Forest Service limited the scope of USF & WS's BO so that it doesn't address these long-term issues either. The result is that site-specific actions are being designed to move towards a DFC that can in no way sustain viable populations of species that require large tracts of older growth forests for survival such as the Indiana bat and sensitive northern long-eared bat (Myotis septentrionalis). The East Side proposed action, unfortunately, is no exception.

Adjusting the desired future condition as determined by the Forest Plan is beyond the scope of the East Side project. In December 1998, ANF personnel prepared the Biological Assessment for T&E Species on the ANF. This assessment documents the impacts on T&E species of the continued implementation of the Forest Plan (at program levels specified in the 1998 BA, which are reduced from program levels included in the Forest.

Plan). The US FWS prepared the BO based upon information contained in the 1998 BA. The BO includes mandatory terms and conditions as well as an incidental take statement. The terms and conditions were reviewed to determine what changes were needed. Amendment 11 to the Forest Plan was prepared and the ANF Conservation Program was developed to address the requirements of the BO. The East Side project has been developed based upon current Forest Plan S&G's, at program levels authorized by the incidental take statement and in accordance with the ANF Conservation Program

Comment 129-30

A.Dunkle Trail Project –

To illustrate further our concerns about DFC on the Allegheny and the East Side Project Area, we will delve into the Dunkle Trail project here as an example. The Dunkle Trail Project contains a telling description of the way in which projects are supposed to pursue the DFC outlined in the Forest Plan.

> The Allegheny National Forest Land and Resource Management Plan (Forest Plan) was approved in 1986. The Forest was divided into areas of similar management emphasis known as Opportunity Areas (OA), in an effort to implement the Forest Plan and achieve the Desired Future Condition.
>
> In order to achieve the outputs described in the Forest Plan, projects are proposed as part of the Allegheny National Forests annuals program of work. Resource management projects are scheduled into this program ... High priority projects are grouped ... into projects which can take place at the same time and in the same general area to best meet the Desired Future Condition as described for a given Management Area, in this case Management Areas 3.0 and 6.1.
>
> <u>B. Need for a Decision and Scope</u>
> The proposed action is necessary to implement the Forest Plan and identify the best combination of treatments that ... meet the Desired Future Condition.
>
> Original Dunkle Trail Environmental Assessment, page I [Emphasis added]
> October 30, 1991

Following the principle that projects are proposed "in order to achieve that outputs described in the Forest Plan," one can project what would happen if the outputs described in the Forest Plan were actually implemented.

Comment 129-30 cont.

We did this in Table 3 below and the results are startling! The reader should make careful note of the fact that the Forest Service has not taken any action to amend the outputs within the Forest Plan.

Table 3: Projected Age-Classes of Allegheny National Forest Under Existing Forest Plan

	0-19	20-59	% Forest < 60 Years Old	>60	% Change In Older Growth	Total Acreage	Total Acreage - No Age	No Age	Data Source
1986	*10,720*	*133,000*	*32.0%*	*305,000*		**514,720**	*448,720*	*66000*	*Real* **2**
1993	*34,611*	*41,380*	*16.5%*	*385,595*	*26.4%*	**506,736**	*461,586*	*45150*	*Real*
1996	*34,718*	*38,615*	*16.1%*	*382,300*	*-0.9%*	**494,858**	*455,633*	*39225*	*Real*
1999	*38,592*	*42,703*	*16.8%*	*401,395*	*5.0%*	**514,123**	*482,690*	*31433*	*Real*
2003	*50,262*	*43,565*	*19.4%*	*388,863*	*-3.1%*	**514,123**	*482,690*	*31433*	*Projected*
2010	*71.549*	*44,989*	*24.1%*	*366,152*	*-5.8%*	**514,123**	*482,690*	*31433*	*Projected*
2020	**101 ' 972**	*47,442*	*31.0%*	*333,276*	*-9.0%*	**514 ' 123**	*482 ' 690*	*31433*	*Projected*
2030	*130,873*	*51,354*	*37.8%*	*300,462*	*-9.8%*	**514,123**	*482,690*	*31433*	*Projected*
2040	*158,330*	*56,614*	*44.5%*	*267,746*	*-10.9%*	**514,123**	*482,690*	*31433*	*Projected*
2050	*184,413*	*63,115*	*51.3%*	*235,162*	*-12.2%*	**514,123**	*482,690*	*31433*	*Projected*
2060	*209,192*	*70,758*	*58.0%*	*202,740*	*-13.8%*	**514,123**	*482,690*	*31433*	*Projected*
2070	*232,733*	*79,449*	*64.7%*	*170,509*	*-15.9%*	**514,123**	*482,690*	*31433*	*Projected*
2080	*255,096*	*89,099*	*71.3%*	*138,495*	*-18.8%*	**514,123**	*482,690*	*31433*	*Projected*
2090	*276,341*	*99,626*	*77.9%*	*106,722*	*-22.9%*	**514,123**	*482,690*	*31433*	*Projected*
2 100	*296,524*	*110,953*	*84.4%*	*75,213*	*-29.5%*	**514,123**	*482,690*	*31433*	*Projected*
2110	*315,698*	*123,005*	*90.9%*	*43,987*	*-41.5%*	**514,123**	*482,690*	*31433*	*Projected*
2 120	*323,484*	*135,715*	*99.3%*	*3,075*	*-93.0%*	**493,707**	*462,274*	*31433*	*Projected*
2 130	*307,310*	*148,496*	*98.6%*	*61468*	*110.3%*	**493,707**	*462,274*	*31433*	*Projected*
2 1 4 0	*291,944*	*160,149*	*97.8%*	*10,180*	*57.4%*	**493 707**	*462.274*	31433	*Projected*
2 150	*277,347*	*170,743*	*96.9%*	*14,184*	*39.3%*	**493,707**	*462,274*	*31433*	*Projected*
2160	*263,480*	*180,342*	*96.0%*	*18,453*	*30.1%*	**493,707**	*462,274*	*31433*	*Projected*
2 170	*250,306*	*189,007*	*95.0%*	*22,961*	*24.4%*	**493,707**	*462,274*	*31433*	*Projected*
2180	*237,791*	*196,797*	*94.0%*	*27,686*	*20.6%*	**493,707**	*462,274*	*31433*	*Projected*
2190	*225,901*	*203,767*	*92.9%*	*32,606*	*17.8%*	**493,707**	*462,274*	*31433*	*Projected*
2200	*214,606*	*209,968*	*91.8%*	*37,701*	*15.6%,*	**493,707**	*462,274*	*31433*	*Projected*

Notes:
1993 - For MAs 6.4, TO, 8.0 and 9.1 we had to use 1996 figures since none were available for 1993. These management areas are however predominantly protected and therefore this should provide us with conservative figures.

One can see that the outputs in the Forest Plan paint a poorer picture for the forest than the desired age-class composition itself The one flaw this table has is that it does not compensate for protected forest and therefore it should be noted that around 2070 the composition would likely level off. Nevertheless, by 2070 more than 60% of the forest would be less than 60 years of age. This is plainly consistent with the projections detailed in Table 2 of these comments.

It is important to note than more than 90% of MA 3.0 would then fall within the 0 to 50 year age classes - virtually ensuring that most species dependant on older forests will not be maintained simply because no habitat exists for those species anymore. MA 3.0 is the largest area of the forest. Nevertheless, site-specific actions such as Dunkle Trail and East Side continue to pursue this unsustainable DFC. And the Forest Service has proposed no changes to that DFC for the forest. The Forest Service is deliberately creating an even-aged tree farm of the artificial commercially desired "Allegheny Hardwoods Forest Type" across the Allegheny.

The following table (Figure 1) from the May 3 0, 1995, Environmental Assessment (hereinafter, "EA") characterizes how site-specific actions such as Dunkle Trail characterize the DFC:

FIGURE 1 did not reproduce. See letter #129 p. 16 in the project file.

This table taken from the Dunkle Trail EA should give the reader an idea of the disparaging difference between Forest Plan direction and current conditions on the Allegheny. The issue that is never discussed in the Draft EIS for Threatened and Endangered Species Management on the Allegheny is what the actual effects of implementing the goals and objectives within the Forest Plan would be.

Ten percent of the Dunkle Trail Project Area is within the 0 to 20 year age class. This is higher than the Forest average (8%). Nevertheless, the proposed action would move the Dunkle Trail Project area toward a DFC of 20 to 25% within the 0 to 20 year age class. This DFC is consistent with that described in Table 2 of these comments. None of the relevant documentation, however, analyzes the impacts of actually implementing the DFC on any of the sensitive, threatened and endangered species on the Allegheny. In fact, none of the Supplemental EAs analyze the long-term impacts that would result from implementing the DFC. Neither does the Draft EIS for threatened and endangered species. If none of these documents analyze the impacts of the DFC how can the

Comment 129-30 cont.

Forest Service say that they wish to achieve it? How then can one say that such a condition can maintain healthy viable populations of Indiana bats? The Forest Service clearly can not draw these conclusions. But these conclusions are being drawn by the Forest Service despite the lack of supporting evidence. Despite these conflicts all of the projects out for public comment (and already approved), including the East Side Project, are designed to achieve the DFC outlined in the Forest Plan. Clearly, the release of these timbering projects, including East Side, represents a serious (perhaps deliberate) flaw of logic. This is arbitrary and capricious decision-making at its worst.

As described in Chapter 1 of the FEIS, the purpose and need (pp. 2-8) are closely tied to moving from the existing condition towards the desired future condition (DFC). The DFC is determined by the Forest Plan and is therefore beyond the scope of a Forest Plan implementation project such as the East Side EIS.

Comment 129-31

B. Greely Farm Timber Sale –

The Greely Farm Timber Sale also looks at the DFC as a basis for action. Below (Figure 2) is the table from the original EA which becomes the basis for the assertion that more clearcutting is necessary.

FIGURE 2 did not reproduce. See letter #129 p. 17 in the project file.

As can be seen, the simple fact that the current 0 to 20 year age class is below the DFC is a fundamental basis for decision-making. In this case, such a condition pre-determines the need to clearcut and create more 0 to 20 year age class. This, however, may be undesirable for species that prefer to use older closed canopy forests such as the Indiana bat and northern long-eared bat, which prefers even higher closed canopies than the Indiana bat (Kurta and Foster 1999). The text of the EA supports this fact:

> E. Proposed Action
> Based on the information generated during the field and record analysis of this area and comparisons to the Desired Future Condition, a proposed action was developed to bring the Greely Farm project area closer to the DFC for Management Area 3.0 and to meet the project objectives.
>
> Vegetation/Habitat –
> A total of 345 acres of vegetation/habitat management would take place. vegetation/habitat opportunities we currently would like to take advantage of are summarized in Table 2.
>
> A total of 285 acres would be harvested utilizing even-age management techniques. Stands 66 and 75 would receive an herbicide/shelterwood removal; stands 81, 103, 104, and 147 an herbicide/shelterwood removal, stands 81, 103, 104, and 147 an herbicide/shelterwood seed/removal; stand 69 an overstory removal; stands 14,134, 138, 139, 142, 143, 144, and 145 a shelterwood removal; and stand 72 an integrated thinning. Two timber sales would be generated, the first producing 2.5 MMBF and the second 2.5 MMBF.
>
> original Greely Farm Environmental Assessment, page 8
> August 19, 1994

This passage, taken directly from the Original EA demonstrates the progression that begins with the DFC and ends with even-aged cutting. Note the extensive emphasis on even-aged cutting (285 of 345 acres of planned management activities). Then note the extensive emphasis on removal cuts (more commonly known as clearcuts) which are being used on 252 of the 285 even-aged acreage. Basically, if you follow the logic displayed in the original EA it is very clear that a DFC that promotes younger age-classes directly results in management activities that promote younger age-classes. The result of a DFC that emphasizes the achievement of a forest dominated by younger trees is management projects that emphasize removal cuts and other types of clearcutting. Likewise with the East Side Project, the preferred alternative calls for almost all even-aged management practices designed to perpetuate the ecologically disastrous DFC.

The discussion of Indiana bat habitat and evaluation of effects included in the FEIS for Threatened and Endangered species on the Allegheny National Forest, signed July 28, 2000, is based upon information presented in the December 1998 BA for Threatened and Endangered Species on the ANF (pp. 15-42), and the June 19, 1999 Biological Opinion on the Impacts of Forest Management and other activities to the Bald Eagle, Indiana bat, Clubshell and Northern Riffleshell Mussel on the ANF (USDI-FWS 1999b pp. 21-36). Information presented in both of these documents is based on the Draft Indiana bat Recovery Plan, which has been developed by the top bat experts in the nation and represents the consensus of these experts on the biology, habitat, and management of the Indiana bat.

Comment 129-31 cont.

As described in the Recovery Plan, there may be may be variations in habitat preferences and use for the Indiana bat throughout its range. However the Forest relies heavily on the information presented in the Indiana bat Recovery Plan. In addition, information included the FEIS for Threatened and Endangered Species on the Allegheny National Forest is based upon three years of on-forest monitoring for the Indiana bat and on-going informal consultation with the USFWS. As a result, analysis and information presented in the FEIS is based on the most current and applicable information related to Indiana bat habitat and populations on the Allegheny National Forest.

As described in Chapter 1 of the FEIS, the purpose and need (pp. 2-8) are closely tied to moving from the existing condition towards the desired future condition (DFC). The DFC is determined by the Forest Plan and is therefore beyond the scope of a Forest Plan implementation project such as the East Side EIS.

Also, see Comments 129-29 and 129-30.

Comment 129-31a

C. Derringer Timber Sale –

Under the guidelines of the NEPA, the Forest Service must look at how the proposed East Side Project will affect the Allegheny and its flora and fauna when considered cumulatively with other timber sales recently released for comment. An important issue that is consistently the case for each of the Allegheny timber sales released since March is how the DFC is treated in the supplements for various timber sales. For example, the Derringer Supplemental EA draws the same conclusion that all of the supplements do:

> There are no references in the BO (terms and conditions) which suggest that a change in management objectives for Management Area 3.0 is needed.
>
> Derringer Supplemental Environmental Assessment
> February, 2000.

This statement is self fulfilling in that it inaccurately describes what the BO considered. The BO was based on a different set of proposed objectives (outlined in the BA -- and they are "proposed" because they have never been approved through a NEPA process) than those outlined in the Forest Plan.

In fact, as the following chart (Table 4) demonstrates, the objectives considered by the BO differ dramatically from those outlined in the Forest Plan. Table 4 compares the levels of logging considered within the scope of the BO with the objectives outlined in the Forest Plan.

Forest Plan v. Biological Opinion

	FY 2000		FY 2001		FY 2002		FY 2003		TOTAL	
	Plan 1	**BO**	**Plan** 1	BO	**Plan**	BO	**Plan** 1	BO	**Plan** 1	**BO**
Total Sell (MMBF)	94	55	94	55	94	55	94	55	376	220
Clearcut/Removal Cuts (acres)	3400	2284	3400	2084	3400	2084	3400	2084	13600	8536
Shelterwood Seed (acres)	3060	4000	3060	2000	3060	2000	3060	2000	12240	10000
Thinning (acres)	7800	7000	7800	3225	7800	3225	7800	3225	1200	16675
Selection Cuts (acres)	0	700	0	800	0	800	0	800	0	
			Total million Board feet Potentially Logged =						**376**	**220**
			Total Ares potentially impacted =						**57040**	**38311**

Forest Plan Management Area 3.0 v. Biological Opinion

	FY 2000		FY 2001		FY 2002		FY 2003		TOTAL	
	MA 3	BO	MA 3	BO	MA 3	BO	MA 3	BO	MA 3 1	**BO**
Total Sell (MMBF)	80	55	80	55	80	55	80	55	320	220
Clearcut/Removal Cuts (acres)	3020	2284	3020	2084	3020	2084	3020	2084	12080	8536
Shelterwood Seed (acres)	2718	4000	2718	2000	2718	2000	2718	2000	10872	10000
Thinning (ac es)	6760	7000	6760	3225	6760	3225	6760	322	7040	16675
Selection Cuts (acres)	0	700	0	800	0	800	0	800	0	3100
			Total million Board feet Potentially Logged =						**320**	**220**
			Total Ares potentially impacted =						**4992**	**38311**

Comment 129-31a cont.

Forest Plan (w/Carry-over Acreage) v. Biological Opinion

	Sub-Total		Potential Carryover	TOTAL	
	Plan 1	BO		Plan 1	BO
Total Sell (MMBF)	376	220	503	879	220
Clearcut/Removal Cuts (acres)	13600	8536	18956	32556	8536
Shelterwood Seed (acres)	12240	10000	22893	35133	10000
Thinning (ac es)	31200	16675	73530	104730	16675
Selection Cuts (acres)	0	3100	-874	-874	

	Plan	BO
Total million Board feet Potentially Logged =	**376**	**220**
Total Ares potentially impacted =	**57040**	**38311**

The acreage outlined in the Forest Plan (detailed in Table 4) reflect those that would be implemented if the Forest Plan's DFC was fully implemented. Note the major differences between those actions considered in the BO versus those allowed by the existing Forest Plan. Within the next four years the Forest Plan would allow up to 400% more cutting than the BO ever considered. This does not even address those effects that would occur beyond 2003.

In a May 20, 2000 Bradford Era newspaper article, Allegheny spokesperson Kathe Frank was quoted as saying "We have incorporated all the standards and guidelines discussed in the biological opinion" (Buck 2000). This is obviously a false statement, as detailed in black and white within Table 4.

So, it is clear that the BO did not even consider whether or not management objectives for MA 3.0 need to be changed. That decision was not within the purview of the BO. Approximately 82% of the East Side Project falls into MA 3.0 according to the East Side Draft EIS.

Until the EIS for the Forest Plan amendment is completed, there simply is no way for the Forest Service to make the determination as to whether or not management objectives for MA 3.0 need to be changed. The statement (which has been made in all 42 Supplemental EAs released to this date -- 14 of which were approved) that the BO does not "suggest that a change in management objectives for MA 3.0 is needed" is a deceitful way of ignoring the effects of pursuing the management objectives outlined in the Forest Plan. Any true analysis of the objectives in the Forest Plan would show that they are not consistent with the conservation and recovery of threatened and endangered species. But the Forest Service carefully avoids ever making this analysis. Management of MA 3.0 does not even address the BO in the East Side Draft EIS. Production of publicly subsidized wood for the timber industry is the main component of the Forest Service's attitude found in the East Side Draft EIS with regard to MA 3.0: "There is a need to provide wood to meet people's demand for wood products such as furniture, paper, fiber, and construction materials ... The ANF Forest Plan allocates land for the sustainable production of wood (MA 3.0)." Until the time that such an analysis has been carefully and thoughtfully completed, the East Side Project should not go forward.

See the Cumulative Effects sections of Chapter 3.

The East side project is tiered to the Allegheny National Forest Land and Resource Management Plan which includes the amendment for Threatened and Endangered Species which was signed on July 28, 2000.

Also, as pointed out in the responses to Comments 129-29, 129-30 and 129-31, the DFC is determined by the Forest Plan and is beyond the scope of the East Side project.

Comment 129-32

D. South Branch Willow-Creek Timber Sale-

The South Branch Willow Creek EA gives a good presentation of how the DFC influences the selection of alternatives for any given project, such as the Willow Creek or East Side projects. As might be expected from this table (Figure 3), Alternative 2 was selected by Ranger Schultz:

FIGURE 3 did not reproduce. See letter #129 p. 21 in the project file.

Comment 129-32 cont.

Clearly Alternative 2 has the highest environmental impact of all the available alternatives. It creates the most 0 to 20 year age class and results in the highest road density. Selection of Alternative 2 of the East Side project has the most significant of environmental impacts of the 4 alternatives, and is based on maintaining the DFC.

See Tables 16, 17, and 18 for a summary of how each alternative moves towards or away from the DFC by Management Area. Please note that the selection of alternative 2 for the East side project would result in the creation of no 0-20 age class, Table 72, p. 174.

Comment 129-33

E. Wolf Run Salvage Timber Sale-

Even an area with a pre-existing high 0 to 20 year age class composition falls (Figure 4) under the DFC in the Forest Plan. This is clearly an indicator of how a high (unsubstantiated) DFC can result in unnecessarily high fragmentation of the forest -- potentially dangerous to roosting bats. This table from the Wolf Run Salvage EA speaks for itself:

FIGURE 4 did not reproduce. See letter #129 p. 21 in the project file.

For obvious reasons no more cutting should have (or should in the future) occurred at Wolf Run. The Forest Service approved this timber sale anyway -- because of the outrageous DFC.

The Wolf Run Salvage Timber Sale was approved under a previous NEPA document and is being reviewed by the Supplemental EA process with regards to new information. As pointed out in Comments 129-29, 129-30 and 129-31, the DFC is determined by the Forest Plan and beyond the scope of the East Side project.

Comment 129-34

F. Hoffman Farm Timber Sale –

MA 3.0 dominates most of the landscape within the Allegheny. Therefore most of the cutting falls within this area. Approximately 83% of the East Side Project falls within MA 3.0. And because MA 3.0 self-justifies the use of even-aged management, the result is also that most of the cutting (over 90%) is even-aged cutting, as can be seen with the East Side Project. Hoffman Farm is unique in that it falls in one of only 3 small areas where uneven-aged management is emphasized. Unlike the even-aged management timber sales, this sale maintains at least some canopy cover and emphasizes mature forest. This sale shows that uneven-aged management (although not as optimal as preservation) is a viable alternative to even-aged cutting, and should be considered more often for timber sales like Hoffman Farm and East Side.

Comment noted. See Alternatives Considered But Eliminated From Detailed Study p. 29. See the Feasibility of Uneven-aged Management section of Chapter 3, p. 148. Also, see Appendix B pp. 15-17, and Appendix F.

Comment 129-35

G. Duck/Sheriff Project –

Likewise, with the Duck/Sheriff Project, the preferred alternative calls for 751 acres of shelterwood seed cuts, 954 acres of removal cuts, 1,665 acres of thinning, and 271 acres of selection cuts. These are all even-aged management practices designed to perpetuate the commercially desired DFC at the expense of the forest and overall ecological health in the Allegheny. The horrendous maintenance regime of the DFC can only be highly detrimental to species that are Proposed (for listing), or are listed as Endangered, Threatened, or Sensitive (hereinafter, "PETS"). The Duck/Sheriff comprises occupied habitat for 10 PETS species, and contains suitable unoccupied habitat for 18 additional such species. This maintenance of the DFC as manifested in the proposed Duck/Sheriff Project can be termed without a hint of hyperbole to be a holocaust to the flora and fauna and ecological integrity of MA 3.0 and the Allegheny as a whole.

This comment is directed at the Duck/Sheriff project and is therefore beyond the scope of the East Side project. See Comments 129-29, 129-30 and 129-31 for information regarding the DFC. See Comment 129-24 for references to habitat for PETS species.

Comment 129-36

H. East Side Project –

The East Side Draft EIS uses the same type of analysis to draw its pro-logging conclusions (Figure 5):

FIGURE 5 did not reproduce. See letter #129 p. 22 in the project file. .

As you can see, there already exists a high percentage of 0 to 20 year age class within the East Side Project Area. But, due to the unsustainable Objectives outlined in the Forest Plan the EC for 0 to 20 year age class still falls far below the DFC. It should be noted at this point, that the 9% DFC for 0 to 10 and 11 to 20 year age classes is the maximum allowable acreage within those age classes. This is because the Objectives outlined in the Forest Plan are actually the amount of acreages that would need to be cut if the Forest Service were to achieve the Allowable Sale Quantity detailed in the Forest Plan. Therefore, it is not necessarily desirable to achieve that 9%.

See Comments 129-29, 129-30 and 129-31, for a discussion of the DFC as it relates to the Forest Plan.

Comment 129-37

Nevertheless, one can easily recognize that while the EC for 0 to 20 year age classes is high, the EC for the 111 + year age class is very low. Despite the fact that the EC falls far below the DFC for old growth, the Forest Service proposes no action to move towards this objective. In fact, the proposed action explicitly moves the East Side Project Area away from the DFC outlined in the Forest Plan for old growth. So does, in fact, Alternative 3 (which is rounded up in Figure 6 below).

FIGURE 6 did not reproduce. See letter #129 p. 23 in the project file..

Note in Figure 6 how the Proposed Action (Alternative 1) would move the East Side Project Area away from the DFC for old growth. The same is true for Alternative 3 which is barely over 4.5%. As it is, the Forest Service should be specifically designating areas to be conserved into old growth other than the 6% that would remain in the other alternatives. Through natural disturbance that 6% can easily be knocked below the Forest Plan required minimum of 5%. So, it is that once again, logging takes precedent over conservation.

The EC and DFC for the East side project area are described on pp. 3-5 and are identified in terms of percentages of the project area. Table 80, p. 184, displays the age class distribution that will be found across the project area for each alternative. See Chapter 3, pp. 100, 101, 146,147, 190, 191, 196, 212, and 218 for discussions concerning late successional habitat and old growth.

Comment 129-38

In addition to the above comments, the statement that under Alternatives 2, 4, and 5 no new 0 to 10 year age class would be generated is patently false. First of all, natural disturbance via large-scale windthrow is common on the Allegheny Plateau and would undoubtedly create additional 0 to 10 year age class. Secondly, the Forest Service is likely to propose other timber sales within the next decade that would fall within the East Side project area. In fact, they already have such timber sales planned. The Brookston Timber Sale, for example, falls within the East Side Project Area and would create additional 0 to 10 year age class. Yet, this table does not represent that proposed action and is therefore misleading.

The statement referenced means that if no regeneration harvesting is selected, then there would be no 0 to 10 year age class created as a result of this project proposal. See the cumulative effects sections for discussions of reasonable foreseeable activities. Also, see the effects of implementing Alternative 5 (No Action) discussion on p. 169 of the FEIS.

Comment 129-39

So, the Forest Service selectively follows the illegal 0 to 20 year age class DFC of 18% in advocating for more clearcut logging in the Allegheny. This kind of bias can not continue unchallenged. It is illegal and irresponsible management that should not and can not go forward.

Comment noted. See Comments 129-29, 129-30, and 129-31 for the discussion of the Forest Plan DFC and how it relates to the East Side project. Also, see the Purpose and Need discussion in Chapter 1.

Comment 129-40

Conclusion - In summary, the DFC as set forth in the Forest Plan is not in fact desirable at all for the continued maintenance of viable populations on the Allegheny. Despite this fact, a major effort to approve timber sales that pursue this DFC has been launched. All of these timber sales released since March, including the massive East Side Project, are designed to move toward that out-dated DFC.

Comment noted. Please Comments 129-29, 129-30, and 129-31 for the discussion of Forest Plan DFC and how it relates to the East Side project. Also, see Comment 129-24 for a discussion of the effects to PETS species.

Comment 129-41

In fact, to date, 40 timber sale projects have been released for public comment since the USF&WS released their BO in June of 1999. Twenty-eight of these timber sales have been released for public comment since March 1, 2000. To date no effort (since the original Forest Plan in 1986) has been made to analyze the impacts that continued pursuit of the DFC, as set forth in the Forest Plan, would have on the maintenance of viable populations of threatened and endangered species on the Allegheny. This is true despite major changes in the Allegheny National Forest's Threatened, Endangered, and Sensitive species lists. For the Forest Service to continue management in this direction surely constitutes a violation of the requirements of the National Forest Management Act (hereinafter, "NFMA") to maintain viable populations of all flora and fauna. To make matters worse, the Forest Service has failed to identify quantifiable objectives for PETS species.

It is important to realize that this is not simply an issue of semantics. The Forest Plan is supposed to document what types of direction will be pursued on the Allegheny. Before the East Side Project proceeds any further, the ongoing amendment of the outdated Forest Plan should be completed (and the recommendations outlined in our April 24 comment letter incorporated). The Forest Service has attempted to justify this project by simply pointing to the Forest Plan, which explicitly states that high quality wood production is a primary objective (page 3-5). The public no longer supports such emphasis on this single, narrow objective. The public wants to see such values as aesthetics, biodiversity, protection of endangered species, protection and restoration of soil and water, and restoration of climax forests given equal or greater weight in decision making. The Forest Plan highly compromises the status of threatened and endangered species in the name of commercial black cherry production. The DFC reflects this. The resulting large-scale clearcut management also reflects this.n analysis of the current planned activities by the Forest Service makes it clear that it is the DFC within the Forest Plan that they are pursuing on the programmatic level -- and not the cutting levels projected in the BO. In late September of 1999 the Forest Service approved 14 timber sales. These timber sales began implementation early in Fiscal Year 2000. In total, these 14 timber sales called for 2,169 acres of removal cutting -- more than 1 years allowable incidental take. If one includes the 28 Supplemental EAs released for comment since March 1, 2000, the Forest Service has moved to approve at least 4,797 acres of removal cuts. This is more than 2.5 years worth of incidental take allowed by the BO -- yet the Forest Service has moved to approve this much in a single year. This is a major problem especially considering that the Forest Service plans to release several additional Supplemental EAs.

See Comments 129-29, 129-30, and 129-31 for a discussion of the relationship between the Forest Plan and DFC. See Comment 129-24 for a discussion of the effects to PETS species. See Comment 129-28 for a discussion of the amendment to the BO regarding incidental take.

Comment 129-42

Due to this concern we did a quick analysis of the impacts of the EAs approved last fall, the proposed Supplemental EAs, the Duck/Sheriff Draft EIS, and the East Side Draft EIS, all of which have been recently released for comment. Table 5 illustrates the acreage proposed for logging activities, prescribed burning, and road building activities:

Table 5. Acreage Approved in Proposed actions

	Approved 9/99	Released 3/00	Duck-Sheriff	East Side		TOTALS-
TIMBER MANAGEMENT						
Clearcut	**0**	41	0	1 1		52
Shelterwood Seed/Prep	257	563	751	**2,075**		**3,646**
Shelterwood Removal	**2,169**	**2,628**	868	**3,046**		**8,711**
Thinning	**78**	791	**1,714**	**4,265**		**6,848**
Selection Cut	5	216	271	342		834
					Total Acres Logging	**20,091**
PRESCRIBED BURNING	0	122	0	0	**Total Acres Burning**	122
ROADS (in miles)						
Construction	0.2	0.3	1	17.2		18.7
Recontruction/B	0.8	1.9		19-5		33.4
	1.6	**0**	**23.1**	**53.8**		78.5
					Total Miles Road Activity	**130.6**

As Table 5 shows, there is already a significant amount of logging proposed for the Allegheny despite the fact that the Forest Service has not completed a final plan for conserving threatened and endangered species. Table 6 below shows how these proposals compare to the incidental take allowed under the USF&WS's BO.

Table 6. Proposed Logging v. BO Incidental Take

	Sub-Totals			Biological Opinion Allowable Take				
	Supplements	EIS Projects	TOTAL	FY 2000	FY 2001	FY 2002	FY 20003	TOTAL
TIMBER MANAGEMENT								
Clearcuts	41	11	5 2_	420	220	220	220	1 ,080
Shelterwood Seed/Prep Cuts	820	**2,826**	**3,646**	**4,000**	**2,000**	**2,000**	**2,000**	**10,000**
Removal Cuts	**4,797**	**3,914**	**8,711**	**1,864**	**1,864**	**1,864**	**1,864**	**7,456**
Thinning Cuts	869	**5,979**	**6,848**	**7,000**	**3,225**	**3,225**	**3,225**	**16,675**
Selection Cuts	221	613	834	700	800	800	800	**3,100**
PRESCRIBED BURNING	122	0	122	40	40	40	40	160
ROADS (in miles)								
New Construction	0.5	18.2	1 9	73	55	55	55	238
Re-Construction	2.7	30.7	33	55	55	55	55	220
Restoration	1.6	76.9	7 9	3	3	3	2	1 2
TOTAL	**4.8**	**125.8**	1 31	1 31	1 13	11 3	1 13	470

It can be seen that the proposals that are out there already exceed the incidental take for removal cuts throughout the entire period of the incidental take. This is a problem. Especially since removal cuts, which move canopy closure to less than 10%, are the most destructive (along with other forms of clearcuts) to the habitat of the endangered bat and mussels. This variety of proposed activity can not go on unsubstantiated.

See Comment 129-28 for a discussion of the amendment to the BO regarding incidental take.

Comment 129-43

Unfortunately this is not the limit to the proposed logging activity. Besides the Duck/Sheriff and East Side Draft EISs, the additional Supplemental EAs that the Forest Service has been releasing this spring, there are also plans to release draft environmental documents and decisions for a number of other planned timber sales. Some of these planned sales are detailed in Table 7 below.

Table 7. Additional Planned Timber Sales

	North Fork Chappel Timber Sale	Brookston Timber Sale	Big Run EIS Timber Sale	Brush Creek Timber Sale	Goose Pond Timber Sale	County Line/Four Mile Run Timber Sale	TOTAL
TIMBER MANAGEMENT							
Clearcuts	0	0	10	28	14	0	**52**
Shelterwood Seed/Prep Cuts	185	116	167	488	132	0	**1,088**
Removal Cuts	200	142	370	814	143	0	**1,669**
Thinning Cuts	161	315	476	405	781	0	**2,138**
Selection Cuts	40	0	0	0	0	0	**40**
PRESCRIBED BURNING	0	0	0	0	0	0	**0**
ROADS (in miles)							
New Construction	0	0.4	0.9	7.7	3.4	0	**12.4**
Re-Construction	2 1	2 14	12	2.4	2.6	2	**23.6**
Restoration	3.1		5.5	15.6	5.9	0	**31.3**

As can be seen, these other sales will contribute significantly more timbering towards the *already* illegal take levels. We have summarized the totals of all of these sales and compared them with the allowable incidental take set forth in the BO. The results are displayed in Table 8 below.

Table 8. Total Proposed Actions (excluding unreleased Supplemental EAs) v. Incidental Take

	Sub-Totals			Biological Opinion Allowable Take				
	Table 5 Totals-Table	6 Totals	TOTAL	FY 2000	FY 2001	FY 2002	FY 20003	TOTAL
TIMBER MANAGEMENT								
Clearcuts	52	52	104	420	220	220	220	1,080
Shelterwood Seed/Prep Cuts	3,646	1,088	4,734	4 000	2,000	2,000	2 000	10,000
Removal Cuts	8,711	1,669	10,380	1 864	1,864	1,864	1 864	7,456
Thinning Cuts	6,848	2,138	8.986	7 000	3,225	3,225	3 225	16,675
Selection Cuts		40	874	700	800	800	800	3.100
TOTAL	20,091	4,987	25,078	13,984	8,109	8,109	8,109	38.311
PRESCRIBED BURNING	122	0	122	40	40	40	40	160
ROADS (in miles)								
New Construction	19	12.4	3 1	73	55	55	55	238
C onst **u tion ric**	33	2 3.6	7	55	55	55	55	
Resto ti .	79	31.3	1 10	3	2	3	3	1
TOTAL	131	67.3	198	131	1 13	1 13	1 1 3	47

As one can see, the Forest Service intends on approving nearly 3,000 more acres than the 130 allows in terms of removal cuts -- all within the next year. And this does not include the County Line/Four Mile Watershed EIS or the additional Supplemental EAs yet to be released for comment. This also does not include any other timber sales that the Forest Service might attempt to implement in Fiscal Years 2001, 2002, or 2003. There is only one solution to this problem. The Forest Service needs to consult with the USF & WS on the programmatic level. The 1999 consultation attempted to avoid programmatic consultation by developing a four year plan that was detailed in the Forest Service's BA. The BA as an actual programmatic document is meaningless, however and can not substitute for the accepted programmatic planning detailed in the Forest Plan. The goals and objectives that are detailed in the Forest Plan, and which are the basis for approving a multitude of timber sales, were not evaluated within the BO. Instead, the Forest Service substituted numbers from their BA - an action that is both unlawful and inappropriate.

See Comment 129-28 for a discussion of the amendment to the BO regarding incidental take.

Comment 129-44

The Forest Service makes it very clear that they have no intention of fixing this problem:

> 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 2 of the Forest Plan, are not altered in any way. (Page 2 of the Shingle Mill Supplemental EA)

Comment 129-44 cont.

Ironically, the Forest Service recognizes that the BO was supposed to consider the direction declared in the Forest Plan:

> The first finding in the BO includes actions that are considered to be the minimum needed to ensure that projects carried out under the direction of the Forest Plan would not jeopardize the continued existence of the Northern riffleshell mussel. (Page7)

It should be noted that the Forest Plan on Page 4-1 clarifies what is meant by "the direction of the Forest Plan":

> Management directions contains both Forest Direction and Management Area Direction. Forest Direction consists of goals, objectives and standards and guidelines which are applicable to the entire Forest. Management Area Direction consists of the objectives, the associated management practices, and standards and guidelines to individual areas of the Forest. (Page 4-1)

Page 4-2 of the Forest Plan elaborates a little further:

> The goals and objectives provide the basis for overall direction regarding the type and amount of goods and services that the Forest will provide. The standards and guidelines contained in the Forest Direction prescribe the conditions that should be maintained on all acres of the Forest while achieving the goals and objectives [emphasis added].

Comment noted.

Comment 129-45

It should be noted that the amount of goods and services is the issue here. The USF&WS issued a BO only on the amount of goods and services detailed in the BA combined with the Standards and Guidelines detailed in the Forest Plan. Consultation, however, should have revolved around the amount of goods and services detailed in the Forest Plan. If the Forest Service wishes to propose a federal action on the programmatic level other than that detailed in the Forest Plan then they must amend the Forest Plan to make it compatible with the proposed action that is considered within the scope of the BO. The Forest Plan is supposed to be one integrated programmatic document that covers the programmatic planning for each national forest. If the Forest Service refuses to amend the Forest Plan to incorporate different levels of goods and services then they must re-enter consultation with the USF&WS.

Comment noted. This comment is beyond the scope of the East Side project.

Comment 129-46

. In the past round of "Supplemental EAs" the Forest Service dismissed comment on social and economic issues as irrelevant. This was shown to be hypocritical by the Forest Service's own words. In the July 9, 1999, "Supplemental EA Rationale and Process Description" for using the Supplementation process the Forest Service states that public "comments will be limited to the possible effects of the new information and new mitigation measures and new information on PETS species." Within the same document however, you cite social and economic reasons for pursuing new approval of previous decisions: "In addition, there are many varied economic, contractual, biological and sociopolitical reasons that support review, evaluation, and implementation (where appropriate) of previous decisions." *When analyzing any Allegheny timbering project, you can not both declare the scope so narrow so as to ignore the sociopolitical concerns that may be raised by the public while you secretly (this document was never released to the public - but instead turned up only after citizens litigated) turned to sociopolitical reasoning to justify implementing these timber sales.*

This comment is about the Supplemental EA process and is beyond the scope of the East Side project.

Comment 129-47

2. In fact, the Forest Service's July 9, 1999, rationalization of the Supplementation process shows that you made several decisions before ever conducting any environmental analysis:

> "Of the 36 sales under contract, over half are nearly completed such that the remaining activity is minor."

The Forest Service has only moved to implement some of these projects, yet the projects call for well in excess of 4,000 acres of cutting already. And most of these cuts are removal clearcuts (where canopy closure is reduced to less than 10%). The decision made here that the impacts are minor is arbitrary and capricious and a violation of federal law. Similar amounts of logging activity have been found to be "significant" requiring the

Comment 129-47 cont.

preparation of an EIS (see Curry v. US. Forest Service). What is most disconcerting is that you made the decision on the significance of these sales far prior to ever drafting a Finding of No Significant Impact (hereinafter, "FONSI"). This demonstrates that the Forest Service does not, and never did, have the intent of objectively considering impacts from the East Side Project. The basis for most of your decisions to approve these sales, as detailed on July 9, 1999, is purely economic:

> "many contract units contain dead and dying trees which lose value the longer we delay opening the sales."
>
> "Many activities are currently under contract and have been suspended since April 1, 1999."
>
> "The economic value to contractors, local community and industry is over 8 million dollars."
>
> "Continued loss of community employment is a likely result of continued shut down." [NOTE: No loss of employment was ever recorded due to the shutdown. in fact, employment figures improved during the shutdown.]
>
> "The cost to government on settling contract claims could be significant."

Only two reasons for moving ahead with these timber sales are even associated with the environment. One of these is purely silvicultural (and therefore focused on commodity production):

> "Opportunities for successfully regenerating stands may be lost if regeneration harvests and subsequent reforestation activities are delayed."

The only justification that even relates to the ecological concerns at hand was that:

> "The BO concluded that Forest Plan implementation is not likely to jeopardize the continued existence of threatened and endangered species. And the 130 provides an incidental take authorization for the Indiana bat, bald eagle, clubshell and northern riffleshell mussels."

This justification gives no consideration to these species. First of all, the BO did not consider implementation of the Forest Plan but instead was based on a different implementation program included as part of the BA. As detailed elsewhere in these comments, implementation of the Forest Plan is an entirely different animal than that proposed in the BA. Secondly, the mere fact that the BO gives an incidental take authorization for these threatened and endangered species is NOT a reason to move forward. The whole purpose of the NEPA and the ongoing EIS for threatened and endangered species is to make the determination on whether or not to move forward. Moving forward without first completing a final EIS is yet another representation of how the Forest Service has no intention of doing anything different despite the potential effects to threatened and endangered species.

Finally, it should be noted that the justifications related to the existence of outstanding contracts ignores the substantial amount of logging to be approved that is in fact not under contract. Reading the Forest Service's arguments for logging, one would think that most of these timber sales were under contract, when this in fact is not the case.

This comment is about the Supplemental EA process and is beyond the scope of the East Side project. However, it should be noted that all of the projects that were reviewed under the Supplemental EA process and are within the zone of mortality for the East Side project were considered (Chapter 3, p. 56) in the cumulative effects analysis.

Comment 129-48

3. In 1891 Congress gave the President of the United States authority to set aside portions of the federal government's vast landholdings as "forest reserves". These later came to become our "national forests." Under these initial regulations adopted by the President to protect and conserve our national forests, no one was to "cut, remove, or use any of the timber, grass or other natural products." It was the "Organic Act", an 1897 Appropriations Bill rider, that first authorized logging on our national forests. Therefore cutting trees was most certainly not part of the original mission of our national forests. The Forest Service should return to the original 1891 mission of our national forests and select the No Action alternative for the East Side Project. This demand does not fall "beyond the scope" of the East Side Project.

All applicable laws and regulations have been followed in the development of the East Side project.

Comment 129-49

4. The Pennsylvania Constitution is very clear that "The people [of Pennsylvania] have a fight to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment" (Article I Section 27). For the benefit of the people of Pennsylvania, and to comply with our Commonwealth's Constitution, the Forest Service should select Alternative 1, the No Action alternative, for the East Side Project. This demand does not fall "beyond the scope" of the East Side Project.

Comment noted. See the ROD for the rationale for the selected alternative.

Comment 129-50

The following comments on public opinion are not "beyond the scope" of the East Side Project.

Comment noted.

Comment 129-51

2. The American people have declared their desire to end the commercial logging program on our national forests, including the Allegheny. A number of polls, including one conducted by the Forest Service in 1994, have shown again and again that the majority of Americans support an end to commercial logging in our national forests (which includes the East Side Project Area). The Forest Service's 1994 nationwide poll found that 58% of Americans opposed ALL extraction for commodities on our national forests - including timbering (USFS 1994)!

As noted in Comment 129-48, all applicable laws and regulations have been followed in the development of the East Side project. This comment is beyond the scope of the East Side project.

Comment 129-52

3. A 1998 poll conducted jointly by prominent Republican and Democrat pollsters found that 69% of Americans now oppose continuing to allow logging on our national forests! (Market Strategies, Inc. and Lake, Snell. Sosin, Perry, and Associates, Inc., June 1998) 4. Citing the above poll results does not fall "beyond the scope" of the East Side Project. Rather, these poll results are directly relevant, and the East Side Project falls within their scope.

This comment is beyond the scope of the East side project. See response to Comment 129-51.

Comment 129-53

1. According to independent surveys, non-timber uses such as recreation (57%), peace of mind (73%), scenic beauty (74%), wildlife habitat (82%), soil protection (85%), clean water (96%), and clean air (96%) were characterized by the general public as "very important" more often (percentages in parenthesis above) than timber (only 27%) (Jones 1993). Accordingly, these uses should receive priority with the East Side Project.

2. Furthermore, non-timber uses such as recreation (57%), peace of mind (76%), scenic beauty (79%), wildlife habitat (85%), soil protection (85%), clean water (94%), and clean air (94%) were characterized by nonindustrial private forestland owners as "very important" more often (percentages in parenthesis above) than timber (only 20%) (Jones 1993). Accordingly these uses should receive priority with the East Side Project.

Please see the Purpose and Need section of Chapter 1.

Comment 129-54

3. Another study found that 78% of the public and 78% of timberland owners in Pennsylvania oppose the general practice of clearcutting while 67% of the public and 66% of private timberland owners disagree with the statement that forests should be used primarily for timber and wood products (Schwartz 1992). Accordingly non-timber uses should receive priority with the East Side Project.

Please see the Purpose and Need section of Chapter 1.

Comment 129-55

4. In another study, a majority (54% of respondents) of citizens preferred preservation of forests over other market driven uses (such as job production), 84% expressed concern that forests would not be "harvested" wisely, and 76% were concerned that "developing our forest resources" will result in logging and exporting of timber (Singletary 1994). These numbers are especially enlightening since the targeted counties were predominantly rural and excluded most suburban and urban communities that tend to favor preservation of forests to an even greater extent. Accordingly, non-timber uses should receive priority with the East Side Project.

5. Additionally, the Singletary poll found that the top 3 priorities of Pennsylvanians included "Protect and conserve land resource," "Protect and conserve water resources," and "Protect and conserve wildlife."

Comment 129-55 cont.

Pennsylvania citizens overwhelmingly demand protection of the natural environment. The East Side Project is NOT consistent with these priorities.

6. Singletary further notes that "Many respondents [in Cameron, Forest, and Elk Counties] commented that ... too much logging' was already affecting rivers and streams as well as wildlife in their local area and that the wages for such work were low." Attitudes in those counties also reflected that "The types of forest-based jobs preferred were recreation and tourism, small scale wood industry, and conservation and management." The East Side Project, which caters primarily to the interests of large-scale timber interests, is completely inconsistent with the ecological and economic views of our region.

7. Citizens overwhelmingly prefer jobs in the recreation and tourism industry over logging/timbering in ALL regions of the state according to Singletary (1994). The East Side Project should not be encouraging industry contrary to the public's will. The East Side Project should NOT be implemented as proposed.8. Citing the above poll results does not fall "outside the scope" of the East Side Project. Rather, these poll results are directly relevant, and the East Side Project falls within their scope.

See the Purpose and Need section of Chapter 1. These issues were analyzed in the Forest plan and are issues that will be dealt within the upcoming Forest Plan revision. The purpose of the East Side project is to move towards the Desired Future Condition as described in the Forest Plan.

Comment 129-56

The Draft EIS needs to address the need for the East Side Project. Just because the Forest Plan allows timber sales, one can not conclude there is a need for the project, especially one the magnitude of East Side. The Forest Service must disclose site-specific monitoring data which demonstrates that there is a need for the sale. For example, the need analysis must also address why natural processes will not create enough early successional habitat. If the analysis claims a need for early successional habitat, the Draft EIS must demonstrate that there is a need for the type of habitat that the Forest Service creates as opposed to the type of early successional habitat that is created naturally.\

See the Purpose and Need section of Chapter 1. Field data collected since the onset of the on-going mortality and decline is available at various offices of the Allegheny National Forest. Please see the effects of implementing Alternative 5 (No Action) on p. 169, however the effects of implementing Alternative 5 can be found throughout the various resource sections of Chapter 3. Site-specific effects of implementing Alternative 5 can be found in Appendix B.

Comment 129-57

1. Many of the PETS species to be affected by the East Side Project are sensitive to fragmentation. From the endangered Indiana bat to the sensitive (and state threatened) yellow-bellied flycatcher (Empidonax flaviventris), PETS species require or at least prefer substantial amounts of unfragmented forests. The East Side Project analysis needs to consider the effects of fragmentation on these species. Also, biodiversity and forest fragmentation must be addressed in regard to all species, not just birds. This includes, but is not limited to: mammals, invertebrates, plants, insects, micro-organisms, reptiles, and amphibians. Sampling effects and minimum area requirements of all species should be assessed. The impact of cowbird parasitism and predation to forest interior birds should be considered. The analysis of impacts to forest interior birds needs to address nesting success. Some studies have documented forest interior birds in recently logged areas. The presence of these species in these areas normally indicate that the species are being harmed. Forest interior birds normally do not successfully reproduce in recently logged areas. These areas, in essence, have become ecological traps. The need for large tracts of forest must be considered in the East Side analysis. According to a recent study published in Science: "Nest predation and parasitism by cowbirds increased with forest fragmentation in nine midwestern landscapes that varied from 6 to 95 percent forest cover within a l 0-kilometer radius of the study areas. Observed reproductive rates were low enough for some species in the most fragmented landscapes to suggest that their populations are sinks that depend for perpetuation on immigration from reproductive source populations in landscapes with more extensive cover" (Robinson et al. 1995). These findings must be weighed heavily in the East Side project.

Anticipated effects related to fragmentation were evaluated at the landscape and sub-watershed scales (p. 205) and effects are discussed on pages 221-223. As described, and based upon on-Forest monitoring, effects of forest fragmentation are expected to be less than those documented in more fragmented landscapes. Although wildlife distribution and use may shift as preferred habitats

Comment 129-57

become available or are lost, based on the analysis provided, effects to the wildlife resource will not be significant under any alternative (pp. 221-223), nor will there be any effects to any threatened or endangered species that were not considered in the BO (Appendix C, pp. C-42 and C-43).

Comment 129-58

2. Fragmentation is an important issue in terms of species viability, and especially within the East Side Project Area. The Draft EA for the Thomas Rock Project was completed in 1997. The Thomas Rock Draft EA incorporated a coarse filter strategy to look at the effects of fragmentation on the viability of interior forest species. The results were alarming. The coarse filter approach found that Alternative 3 of the Thomas Rock Project, which has been incorporated in its entirety into Alternative I of the East Side Draft EIS, would result in an interior forest to edge forest ratio of 0.9: 1. The Thomas Rock Draft EA explained:

> Edge width effects cannot be defined simply, because they vary depending on the parameter you want to measure and the specific habitat need of each species. The interior to edge ration is the key number to focus on. High interior edge ratios mean larger amounts of interior habitat will be available for area sensitive species. When the interior/edge ratio reaches 1: 1, the amount of interior is the same as the amount of edge. **The remaining patches are small, isolated, and unlikely to support viable populations of interior wildlife over time.** –
> Pam Thurston, Wildlife Biologist, U.S. Forest Service (emphasis added)

So, following the Forest Service's own expertise, you can find that the Thomas Rock portion of the East Side project area will no longer maintain habitat for viable populations of interior wildlife over time. This, of course, threatens a violation of the NFMA which requires that viability of these species be maintained. Concerned about what this means for wildlife on the Allegheny we requested that the Draft EIS include edge to interior forest comparisons:

> 32. The analysis needs to consider these findings.
> B) The analysis needs to consider the degree to which the alternatives would impede the movement and dispersal of closed-canopy forest wildlife species between stands and larger regions. The analysis should present and quantify the degree of fragmentation within the project area that has already taken place and those that will occur as a result of the various alternatives. These patterns need to be compared to the historical patterns that existed prior to human disturbance.
> (p. 8 of our comments on the Notice of Intent)
>
> 248. What is the edge to interior forest ratio for this project area?
> (p. 40 of our comments on the Notice of Intent)
> 33. Analysis needs to be conducted and presented to show the range of potential impacts for the following variables:
>
> E) forest patch perimeter to edge ratios.
>
> G) degree of connectivity between both individual forest stands and larger habitat blocks.
>
> H) degree of structural contrast between habitat patches.
>
> I) population viability analysis for species or feeding guilds most prone to fragmentation effects (e.g., area sensitive mammals, forest-dwelling songbirds).
> (p. 8-9 of our comments on the Notice of Intent)

The Forest Service gave the coded responses of "EF" and BA" to these comments. These codes are supposed to indicate that the responses to these comments can be found in the Vegetation Report ("EF") and the Biological Assessment ("BA"). Neither the vegetation report or the Biological Assessment, however, address these issues. Nowhere is an analysis of interior to edge forest ratios conducted. The Vegetation Report is 76 pages long and the Biological Assessment is 51 pages long. We have combed through both and could not find our comments addressed. This is absurd and misses the point and the purpose of Scoping. We brought your attention to a specific and vital issue. You dismissed it with broad "coded" references to large documents. You didn't tell us where in those documents we could find our issues addressed and our careful review of those documents shows that this is probably so because you never planned on addressing these issues.

Therefore we demand that the Draft EIS be re-issued and that the new Draft EIS include a coarse filter analysis comparing interior forest to edge forest within the East Side Project Area. We demand that this analysis be conducted on three levels: 1) by small watershed, 2) by large watershed, and 3)for the entire project area. The Forest Service is required by the NEPA to use the best available scientific information. There is no excuse for not addressing these fragmentation and viability issues.

Comment 129-58 cont.

The edge to interior forest ratio for this project area was not calculated. The best and most recent scientific information available for measuring the affects of fragmentation suggests that there is no single measure that captures all aspects of fragmentation. It is recommended that the aspects selected to analyze fragmentation are those that are of most concern to the question of interest. The aspects that are of most concern for the East Side project are; connectivity of communities, retention of large forested patches, and preventing patch isolation.

The project area is 139,990 acres, of this approximately 2% is proposed for overstory removal, thus retaining a large percentage of mature forest (see Table 51). Given the minimal amount of temporary edge that will be created, the interior to edge number would be diluted within each sub-watershed and more so across the project area.

Landscape patterns were also used in the East Side project to analyze the affects of fragmentation. See pp. 202-204, Landscape Patterns

Comment 129-59

1. The Forest Service completed an EIS for the use of herbicides Roundup (glyphosate) and Oust (sulfometuron methyl) on the Allegheny in 1991. That EIS was prepared without the knowledge that the Indiana bat and northern long-eared bat were using the Allegheny. Furthermore, a wealth of new information has come to light concerning these herbicides. A recent paper covering the impact of glyphosate cites 183 sources, 115 of which were published after the EIS for the Allegheny (Cox 1998). In addition to the new analysis on the impacts of timber cutting, the Forest Service must conduct analysis on the impacts of herbicides before proceeding with the East Side Project. A new Forest-wide analysis is required to reanalyze these impacts. After the new Forest-wide analysis is complete and the Forest Plan has been amended as appropriate, then a site specific analysis relating to herbicides must be done for the East Side Project.

The Allegheny National Forest follows Forest Service national guidance for evaluating new credible scientific information submitted by the public (USDA-Forest Service WO March 1999). Commentors are asked to provide a detailed explanation of why selected studies would significantly change or alter any of the consequences that the Forest Service has disclosed or will disclose. The significance of new information and the rationale as to why the information is important must be explained for selected studies.

Comments should also tie closely to the purpose and need for the project/program under review. In this instance, we are evaluating potential impacts to specific sites. A broader, more programmatic evaluation has already occurred in the FEIS for Threatened and Endangered Species on the Allegheny National Forest (ANF 2000) and in the documents mentioned in the discussion which follows. Your comment does not point out specific concerns for specific sites. Therefore, most herbicide related comment responses in this Appendix provide you with information commensurate with the general nature of your comments.

The reference you provided dealt only with glyphosate, so for the most part the responses will focus only on that herbicide.

The ANF FEIS for Vegetation Management on Electric Utility Rights-of-Way (USDA-FS 1997b) included an updated review of available literature covering the behavior and toxicology of glyphosate (USDA-FS 1997b, pp. A-15 to A-22, A-53 to A-57, A-59, and A-65). That review did not result in any substantive changes to the toxicology discussion for glyphosate documented in the ANF FEIS for Understory Vegetation Management (USDA-FS 1991, Appendix A pp 3-7 to 3-14).

Since 1991, the USDA has completed an updated literature review and risk analysis for both glyphosate (SERA et al 1996) and sulfometuron methyl (SERA et al 1998). These documents include both a human health risk assessment and an ecological risk assessment. The reference section of each contains a partial list of documents reviewed. USDA-Forest Service Washington Office (March 1999) describes the process SERA follows for reviewing the literature available when they undertake a new risk assessment.

Comment 129-59

The Cox 1998 paper you cited is essentially the same [with a few additions and deletions (Dost 1999, p. 1)] as the Cox 1995 and 1995a publications evaluated previously (USDA-FS 1997b). A detailed response to a number of the statements made in those articles can be found in Appendix G, pages 48 through 60 and in the project file (Dost 1999; Dost 1997).

Many of the 115 potentially "new" citations you mentioned are listed in the bibliography of the Risk Assessment for Glyphosate (SERA 1996), indicating they were considered in that analysis. A number have been reviewed in USDA-FS 1997b (Appendix G, pp. 48-60).

Site-specific analysis has been completed for the East Side Project. Stands proposed for herbicide treatment in each alternative are listed in the Vegetation Report (Appendix B Table 23, p B-40 to B-50). No herbicide treatment is proposed for either Alternative 2 or Alternative 5. Alternative 5 is not shown in Table 23 because there are no harvest activities or reforestation treatments proposed (see East Side Project EIS, Table 19, pp. 42 and 43). Outcomes by alternative for each stand are shown in Appendix B Table 24 (pp. B-54 to B-75). Alternative 5 outcomes are the same as those for Alternative 2. Based on site-specific conditions, mitigation measures are listed in Appendix D for each stand.

A discussion of the effects of herbicide treatments can be found in the environmental consequences discussion in Chapter 3: soils are discussed on pp. 66-67. Effects on water are discussed in the FEIS on pp. 83 and 263-265. Effects on midstory/understory vegetation are discussed in the FEIS on pp. 144-146 and 185. A general discussion of effects is in the FEIS on pp. 164-165, direct /indirect effects discussion (p. 149-180), wildlife (p. 210), recreation (pp. 246 and 263-265), visual (p. 251-254, and human health and safety (pp. 263-265).

Comment 129-60

2. The Forest Service has been implementing herbicide projects on the Allegheny. This is illegal. Despite the fact that the Forest Service did not approve activities associated with the Minister Watershed Project until September 30, 1999, the herbicide Oust was used "on 9/13/99 or shortly thereafter," as illustrated in Figure 7:

FIGURE 7 did not reproduce. See letter #129 p. 33 in the project file.

The action illustrated in Figure 7 is entirely illegal. It clearly represents how the Forest Service never intended to do anything other than approve the Minister Valley timber sale. Likewise, the Forest Service applied herbicides as part of the Greely Farm timber sale.

Comment noted. This comment is not germane to the East Side project as the Minister and Greely Farm projects are not part of the East Side project. The Greely Farm project falls within the zone of mortality, but no herbicide application has taken place since 1998. The East Side project is not being implemented and will not be implemented until the appeal period has been completed.

Comment 129-61

It can not be said that the Forest Service can objectively consider the appropriate range of alternatives for the East Side Project when they are already implementing the proposed action. This decision is clearly arbitrary and capricious and a violation of federal law. In fact, this violates the very heart and soul of NEPA - think before you act! This action was especially egregious as ADP organizers Tim Doody and Jim Kleissler (unaware that any activity would be occurring since all projects were to yet to be re-analyzed) were seriously harmed during the summer of 1999 when they accidentally found themselves in an herbicide area shortly after application. The area was not posted, and both organizers became ill - forcing them to return home earlier than planned. Both organizers experienced physical and emotional harm from the event. It can be conservatively estimated that this was not an isolated incident, that other members of the public have likely been similarly unwittingly exposed and adversely affected.

As stated in Comment 129-60, no herbicide application has taken place in the Greely Farm area since 1998.

Comment 129-62

The Forest Service has already announced the intent to reanalyze the impacts of the East Side Project (SIC) on the Allegheny. Implementation of herbicide projects prior to completing the necessary analysis and exhausting the necessary appeals is a violation of the NEPA, it violates the very heart and purpose of the NEPA, and the NFMA, for implementing projects that may not be consistent with the Forest Plan after it is amended (this clarifies why it is important for the Forest Service to amend the Forest Plan before continuing with ANY action).

No activities proposed in the East Side EIS will be implemented until the NEPA process, including the appeals process, has been completed. The Forest Plan was amended on July 28, 2000. See Comments 129-60 and 129-61.

Comment 129-63

3. A 1993 report from the United States Environmental Protection Agency (hereinafter, "EPA") found that glyphosate (Roundup) persists in the soils of Pennsylvania for 128 days - a period much longer than previously thought in the Allegheny's Understory Vegetation Management EIS. This new information must be incorporated into any new environmental analysis, such as the East Side Project Draft EIS.

USDA-FS 1991 indicates that the estimated half-life of glyphosate is less than 60 days for the ANF forest soil conditions (USDA-FS 1991, Chapter 2, p 7 and Chapter 4, pp 1 and 2). Though not specifically cited in your comment, we believe the 1993 U.S. EPA document you mentioned is the one cited by Cox (1998, p. 10) in Figure 6 of her article. The source of the data in Figure 6 (the EPA document referenced thereon) is a glyphosate terrestrial field dissipation study conducted by applying Roundup herbicide as a broadcast application at the maximum use rate (10.7 lb a.i./acre) to eight separate bare ground test plots, one in each of eight representative states across the United States. Contrary to the display in Figure 6, none of the eight sites were in Pennsylvania. These sites were chosen because they represented a wide range of climatological conditions, soil types, and geographic conditions under which glyphosate would be used under normal agricultural practices. They were not selected to represent typical forest conditions, including those found on the ANF. One site located in Ontario County, New York, reflected a glyphosate half-life of 128 days. It is interesting to note that the test site in Ohio reflected a glyphosate half-life of 8 days. (Adams 2000, personal communication) It would be difficult to extrapolate this information to forest conditions.

The predominant route by which glyphosate is metabolized in the environment is through the activity of soil micro flora (Franz et al 1997, pp. 72 and 73 and USDA-FS 1991, Chapter 2, p. 6 and Chapter 4, p. 2). Soil microbiological activity can differ widely between forest soils and agricultural soils. The results of other studies (Franz et al 1997, pp. 78 and 125) indicate glyphosate soil half-lives in forest soils ranging from 3 days to 200 days, with the majority of half-lives well below 70 days. Please note that USDA-FS 1997b Appendix A, p. 19, is a document completed more recently, and that it affirms the half-life of 30 days in soils found on the ANF. We expect this to apply to the East Side Project area.

In summary, the information you provided in your comment does not present any new information beyond that already considered which would prompt the need for additional analysis, review, or changes to impacts discussed.

Comment 129-64

4. An updated version of the 1987 thesis by D.J. Santillo that was cited in the Understory Vegetation Management EIS found that the application of glyphosate was harmful to the abundance of invertebrates and the number of mammals (Cox 1998). This is extremely important because the state of Pennsylvania DCNR classifies invertebrates as important species that are generally at risk. The Allegheny includes many PETS invertebrates. The East Side Project analysis must consider this information.

Analysis documented in USDA-FS 1991 indicates there are no significant toxicity risks to wildlife species or insects from the planned use of glyphosate on the ANF (USDA-FS 1991, Chapter 4 p 16 and Appendix C pp 1, 3, 7, and 8). Updated glyphosate toxicity information and updated information regarding its effects on wildlife habitat in the ANF FEIS for Vegetation Management on Electric Utility Rights-of-Way (USDA-FS 1997b, Appendix C pp 3 and 4) supports this earlier conclusion.

Glyphosate affects animals (and invertebrates) primarily by altering their habitat. As habitat changes, so does the variety and abundance of wildlife species. Research on the effects of herbicides on small mammal habitats and the associated changes in wildlife species composition has reported mixed results most likely because of the variety of habitats within and treatment

Comment 129-64. cont.

methods for the areas treated (USDA-FS 1991, Chapter 4, pp. 16-17). The results of additional studies were summarized and reported in the Final EIS for Vegetation Management on Electric Utility Rights-of-Way (USDA-FS 1997a, Chapter 4, p. 110) and include some of the studies you referenced.

In summary, the information you cited is well within the range of information already considered in the ANF FEIS for Understory Vegetation Management (USDA-FS 1991). It does not prompt the need to change any of the conclusions reached therein, nor does it prompt a need for additional detailed analysis in this EIS.

Comment 129-65

5. A 1992 paper found that the application of glyphosate causes major reductions in the abundance of earthworms (more than 50% even in small applications) (Cox 1998). Earthworms (Lumbricus spp.) perform a vital ecological function by continually mixing and aerating, as well as fertilizing with their castings, soils vital to a healthy forested ecosystem. "In the opinion of Charles Darwin, earthworms may have played a more important role on this planet than any other animal" (Wemert 1989). The ecological role of earthworms and their severe reduction of their numbers through herbicide application needs to be thoroughly considered in the East Side Project analysis.

The Springett et al (1992) study you referenced from Cox 1998 (p 11) is the same study referenced in Cox 1995 (p. 18). The Cox 1995 article was evaluated in detail as part of the analysis conducted for the ANF EIS for Vegetation Management on Electric Utility Rights-of-Way (USDA-FS 1997b, Appendix G, p 54). The Springett et al (1992) study was also evaluated in SERA et al (1996, p 4-3). The project file contains other recent additional information (Monsanto 1997), indicating the low toxicity of glyphosate to earthworms. We again affirm the World Health Organization Environmental Health Criteria 159 conclusion that states, "Glyphosate has low toxicity for bees and earthworms" (USDA-FS 1997a, Appendix G, p. 54).

In summary, the information you provided in your comment does not present any new information beyond that already considered which would prompt the need for additional analysis, review, or changes to impacts already discussed.

Comment 129-66

6. A 1998 paper found that the application of glyphosate causes major reductions in the populations of various insects (greater than 50% reductions for some populations). Various other reports show reductions in populations of woodlice and other beneficial species. These analyses must consider these impacts (Cox 1998).

7. According to Cox (1998), glyphosate has been found to be acutely toxic to fish (many Allegheny PETS species are fish, as are many state threatened and endangered species). The East Side Project must consider this new information.

8. Two Maine studies have found that Roundup can harm the survival rates of small mammals including shrews and voles. Additionally, studies in British Columbia found that both deer mice and chipmunk populations decline after Roundup applications (Cox 1998).

6) The 1988 study you referenced (Hassan et al 1988) from Cox 1998 (p. 11) is the same study referenced in Cox 1995 (p. 16). The Cox 1995 article, including the papers you have indirectly referenced in the subsections on page 16 of the Cox paper titled "Beneficial insects", "Other insects", and "Other arthropods", were evaluated in detail as part of the analysis conducted for the ANF EIS for Vegetation Management on Electric Utility Rights-of-Way (USDA-FS 1997b, Appendix G, p. 50 "Terrestrial Insects"). The discussion related to these topics is essentially identical in both the 1995 and the 1998 papers. That evaluation indicated the Cox articles provided no new information not already considered, and in many cases the Cox discussions of the results of the studies were either incomplete or misleading.

Glyphosate is considered practically non-toxic to insects (USDA-FS 1991, Chapter 4, p. 16 and Appendix C. This low order of toxicity is affirmed in SERA et al 1996 (pp. 4-1 to 4-3 and 4-15 to 4-18) and in USDA-FS 1997b (Appendix C, pp. 1 and 4).

Comment 129-66 cont.

7) A comment very similar to this was considered as part of the FEIS for Threatened and Endangered Species on the Allegheny National Forest (ANF 2000, p F-35)) and the FEIS for the Duck/Sheriff Project (ANF 2000a p E-32). The following discussion is pertinent to the East Side project. In summary, the information you provided in your comment does not present any new information beyond that already considered which would prompt the need for additional analysis, review, or changes to impacts already discussed.

The acute toxicity of glyphosate (formulated as Roundup) to fish is discussed in USDA-FS 1991 (Appendix C, p. 2). The potential for adverse effects on fish depends on exposure, and buffer strips limit this exposure. The overall risk to fish is negligible from typical or maximum exposures, but significant adverse acute effects could occur from an accidental spill or direct application of glyphosate into a pond (USDA-FS 1991, Chapter 4, pp. 16-17, Appendix C, p. 1 & 8). USDA-FS 1997b (Appendix C, pp. 20 -21), based on the latest information available, affirms the negligible risk of acute effects on fish from glyphosate, as does analysis documented by SERA et al (1996, Chapter 4, p. 28). Keep in mind that the glyphosate formulation currently used on the ANF is Accord.

The Cox 1998 paper (p. 12) you referenced is almost identical to the Cox 1995 (p. 17) discussion on the acute toxicity of glyphosate to fish. The Cox 1995 articles, including the papers referenced therein, were evaluated in detail as part of the analysis conducted for the ANF EIS for Vegetation Management on Electric Utility Rights-of-Way (USDA-FS 1997b, Appendix G, pp 53 & 54 "Fish"). That review indicated the Cox articles provided no new information not already considered, and in many cases the Cox discussions of the results of the studies were either incomplete or misleading. The articles quoted actually show that normal operations will not result in unacceptable adverse effects to fish. Water quality monitoring has shown ANF buffer strips to be effective at limiting herbicide movement into streams (USDA-FS1991, Chapter 4, p. 18).

8) See Comment 129-64.

In summary, the information you provided in your comment does not present any new information beyond that already considered which would prompt the need for additional analysis, review, or changes to impacts already discussed.

Comment 129-67

9. Glyphosate and sulfometuron methyl have broad applications and cause mortality in a wide range of plant species. The result is that all PETS plant species, including the federally threatened small whorled pogonia (Isotria medeoloides), are likely to be harmed by the application of these herbicides. The herbicide applications proposed as part of the East Side Project should not be applied. They are contrary to the goal of protecting and preserving wildlife.

At the time the ANF Understory Vegetative Management (UVM) FEIS was prepared, both glyphosate and sulfometuron methyl were known to be broad spectrum herbicides (ANF, 1991; pp. 2-6 and 2-7) that potentially could affect a wide variety of plant species. Analysis documented in this EIS considers those potential effects. Mitigation measures (buffers or no treatment zones) are designed to protect small whorled pogonia and other unique plant communities (USDA-FS 1991, Ch 5, p. 2), including sensitive species. No adverse impacts are anticipated (Appendix D, Plan Amendment EIS).

The BO for the threatened and endangered species amendment indicates Bald eagles, Indiana bats, and Clubshell/Northern riffleshell are not likely to be affected due to low toxicity from and low exposures to herbicides (US F&WS 1999, pp. 10, 11, and 51). This is consistent with the wildlife risk assessment completed for the ANF UVM EIS that concluded there would be no significant risk to any terrestrial wildlife species from the proposed herbicide use (USDA-FS 1991, Appendix C, p. 1), nor would there be any effects on any threatened or endangered species (USDA-FS 1991, Chapter 4, p. 12).

Analysis documented in the Forest Plan FEIS (Ch 4, p. 38, Appendix C, pp. 42-44) looked at the effects from implementing an alternative where herbicides are not used, as did the ANF UVM EIS (USDA-FS 1991, Chapter 2, p. 5). Potential effects on wildlife, including threatened and endangered species, have been evaluated as part of the East Side Project

Comment 129-67 cont.

analysis (see DEIS pp 161, 118, 179, and Appendix C p35). You have not provided new information that has not already been considered in these analyses. There is no indication that there is a need to reconsider or drop herbicide treatments proposed in this EIS.

Comment 129-68

10. According to research conducted by the Forest Service, the application of herbicide in fact increases the composition of interfering vegetation (Horsley). This is contradictory to the stated purpose of herbicide application as part of the East Side Project.

This phenomenon is one of the main reasons ANF personnel conducted the analysis documented in the ANF EIS for Understory Vegetation Management… to evaluate methods for achieving more complete control of grasses and ferns (ANF, 1991; pp. 1-1 to 1-4 and 4-13 to 4-14 and ROD-1). Achieving more effective control of both ferns and grasses was one reason the decision maker chose Alternative 2, which permits ANF personnel to consider using sulfometuron methyl when conditions are appropriate (USDA-FS 1991; ROD-3 and ROD-5 and ROD-7). Site-specific conditions in the East Side project (DEIS Appendix B, Table 22) dictate the type of herbicide treatment proposed.

The reference you cited was based on the first semi-commercial applications of glyphosate on the Allegheny Plateau in 1979. Glyphosate was sprayed from a crawler tractor-mounted sprayer that had a swath width of about 35 feet. As explained in the published report (p. 112), "fern… regrowth was caused by the additional light from the shelterwood cut and an artifact of the application method. The metal cleats on the tracks of the crawler tractor pinched off small segments of the fern rhizome so that Roundup could not be translocated into them." Grass and sedge also increased on herbicide-treated areas after a subsequent shelterwood seed cut. Changes in the equipment used to move the sprayer through the woods and the addition of sulfometuron methyl to the herbicide prescription where ferns and grass are being treated have eliminated these problems.

Comment 129-69

1. The ADP believes that the following comments on wilderness designation within the Allegheny do not fall "outside the scope" of the East Side Project. In fact, the fragmentation that is likely to result from the proposed East Side Project, is the very reason as to why this needs to be addressed.

2. The 8,663 acre Hickory Creek Wilderness Area was designated on the Allegheny in 1984 along with seven islands in the Allegheny River, ranging in size from 10 to 96 acres, totaling approximately 3 68 acres. These are some of the smallest designated wilderness in the entire federal system. At under 9,000 acres, only 1.74% of the Allegheny is federally designated as wilderness (Gorte 1994). This, despite the fact that the Allegheny is over 513,000 acres in size, with opportunities for additional wilderness throughout. In the western United States, for example, 21.52% of California's Forest Service land is designated wilderness. In Washington, the figure is 28.06%, and in Montana the figure is 20.01 % (Gorte 1994). Most eastern states also have a significantly greater area of Forest Service land federally designated as wilderness (Table 9). It is apparent that Pennsylvania, with the Allegheny as its only federal land capable of designating wilderness, has much room for improvement in this regard. Minnesota has 28.63% of its Forest Service land designated wilderness, and like the Allegheny, this land is ministered within the Eastern Region of the U.S.D.A. Forest Service. The ADP believes that a goal of 25-30% of the Allegheny's landbase designated as wilderness should be made a priority pursuit by the Forest Service. The precedent for this has been set in Minnesota

TABLE 9 did not reproduce. See letter #129 p. 115 in the project file.

3. In comparison to western states, many eastern states - particularly Pennsylvania - are lacking with regard to wilderness designation. As stated in the Wilderness Society's Wilderness Handbook:

> Less than 5 percent [of land in the national forest Wilderness Preservation System] lies east of the 100" meridian, and almost half of that is in just two areas - Everglades National Park in Florida and the Boundary Waters Canoe Area in Minnesota. In eleven eastern states from Maine to Maryland, where nearly one-quarter of the nation's population resides, there are less than 200,000 acres of wilderness
> (Watson 1998).

This proposal is beyond the scope of the East Side project. Wilderness needs were considered in the development of the Forest Plan. Wilderness needs will be addressed during the Forest Plan revision process.

Comment 129-70

4. What will the Allegheny look like in 200 years? What will it be like in 500? The Forest Service must consider management strategies which plan at least this far into the future. Creation of more federally designated wilderness within the boundaries of the Allegheny for the purpose of preservation of PETS species, biodiversity in general, and watershed health should be made a priority to ensure future undisturbed old-growth forest in the Allegheny that is free even from the ravages of oil and gas development operations. Even if a bill such as HR 1396, which would end all commercial logging on federal public lands, were to pass, that would not necessarily end drilling for oil and gas which are still prominent on the Allegheny and within the Tionesta Scenic and Research Natural Areas (USFS 1980). Such wilderness designation will also make the Allegheny more attractive to recreationists wanting to see eastern forests in a relatively pristine state. Wilderness areas are of significant value to the American public. As Forest Service Chief Michael Dombeck has said "Representing nearly 20% of the National Forest System and over 60% of the entire Wilderness Preservation system in the lower 48 states, the Forest Service's wilderness legacy is a crown jewel" (Dombeck 1999).

5. The ADP believes that the region of the Allegheny encompassed by U.S. highway 6, state highways 66 and 948, and the communities of Kane, Ludlow, and Sheffield, with the Tionesta Scenic and Research Natural Areas as its core should be strongly considered as a candidate for wilderness designation. Surrounding Forest Service roads should be closed and rehabilitated and private land should be purchased from those willing to sell in the surrounding area. The goal would be a total area of at least 10,000 to 15,000 acres or more designated as wilderness. A priority would be to completely surround the existing Tionesta Areas with wilderness to act as a buffer for the current old-growth conditions therein, which the Forest Service has characterized as "one of the most valuable old-growth remnants in the eastern U.S.... evidenced by the I 0-fold increase in research activity on the Area over the past decade" (Nowak and Nelson 1997). Eventually, the entire Tionesta Wilderness would come to closely resemble its native old-growth forest core, as described by Lutz (193 0) and Bjorkbom and Larson (1977):

> Most of the Allegheny Plateau outside the Tionesta Scenic and Natural Areas is now dominated by second-growth stands of intolerant species resulting from the commercial logging operations of the 1890-1930 era. These secondgrowth stands will eventually revert to hemlock/beech/sugar maple types like those in the Tionesta tract if left undisturbed long enough (13jorkbom and Larson 1977).

6. The privately-held land to the immediate east and southeast of the Tionesta Scenic and Research Natural Areas would be priority acquisitions to such a wilderness area as they lie directly adjacent to the Tionesta Areas and contain the headwaters of significant tributaries to Tionesta Creek.7. Taking the steps towards a Wilderness Area in this location with the Tionesta old-growth as its core would be an outstanding addition to wildlife habitat and the national Wilderness Preservation system as a whole, some of the last true old-growth in the eastern United States, in the range of 10,000 to 15,000 acres or more. If it is made a true priority, this can happen over time (the present-day 8,663 acre Hickory Creek Wilderness was once clearcut and criss-crossed by logging railroads). This wilderness designation would increase the Allegheny (and therefore Pennsylvania) total to approximately 19,000-24,000 acres of wilderness for the Allegheny, or 3.70 to 4.68% of the total landbase of the Allegheny. Furthermore, wilderness is defined by the Wilderness Act as "an area of undeveloped federal land retaining its primeval character and influence ... which generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable." [emphasis added] This definition ensures that wilderness designation under the Wilderness Act does not require completely pristine conditions, but simply predominantly natural conditions (Watson 1998). Therefore, the ADP believes that all cutting units and all other resource extraction activities associated with the East Side Project within the following grid units from the East Side EIS Index Map should be immediately and wholly withdrawn from consideration: H9, H10, H11, H12, I9, I10, I11, I12, J9, JI0, J11, J12, K9, K10, K11, K12.

8. There is also precedent under the NEPA for the creation of wilderness whenever possible. The NEPA requires the federal government, in this case the Forest Service, to "fulfill the responsibilities of each generation as trustee of the environment for succeeding generations," to "assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings," and to "preserve important ...natural aspects of our national heritage..." (§ 101(b)). The Tionesta Areas need to be protected as wilderness to prevent any future encroachment or degradation of their old growth conditions. This fits the criteria outlined under NEPA.

9. Designation of such a Tionesta Wilderness Area would also help alleviate any boundary disputes or boundary recognition problems for the Tionesta Areas. A 1997 Forest Service report recognizes that there are serious problems with accurately determining the boundary for the Tionesta Areas, which has resulted in at least one known instance of timber cutting within the Tionesta old growth (Nowak and Nelson 1997), an utterly and completely unacceptable situation. Although the known result was just two trees cut within the old growth area, it certainly cannot be assumed that this was the only instance of accidental or deliberate timber cutting that has occurred within the Tionesta Areas since their purchase from the Central Pennsylvania Lumber Company in 1936. In fact, the opposite must be assumed to be the null hypothesis. Over time such violations of the Tionesta Areas, be they deliberate or accidental, can only be inevitable under the status quo and the cumulative effect over the decades will most certainly not be "negligible." The ADP believes that as the present situation exists, with logging

Comment 129-70 cont.

on private and public land occurring right up to the boundaries of the Tionesta Areas, a serious threat is posed to the long-term ecological integrity of this irreplaceable remnant of the great eastern old-growth forests that once existed throughout the Allegheny Plateau bioregion before the period of massive clearcutting from approximately 1880-1920.

This comment is beyond the scope of the East Side project. See Comment 129-69.

Comment 129-71

10. At the very least, compartment-stands 831-37 and 831-51 should be immediately, completely, and wholly withdrawn from the East Side Project out of concern for the ecological integrity and border integrity of the Tionesta Natural Area. The fact that these proposed cutting units lie directly adjacent to (83 1 -3 7), or in very close proximity to (83 1-5 1) the Tionesta Research area is patently inappropriate. The Forest Service can not log right up to the boundary of the Tionesta Areas under any circumstances! This is especially true as the Forest Service themselves has recognized serious deficiencies with regard to where the boundary of these National Natural Landmarks in fact lie! The incredibly irresponsible existence of these two cutting units is highly illustrative of the single-mindedness of the Forest Service for timber cutting over ALL OTHER VALUES associated with the Allegheny such as recreation, ecosystem services, and wildlife habitat. Immediately withdraw compartment-stands 831-37 and 831-51.

Stands 831-37 and 831-51 are outside the boundaries of the Tionesta Scenic and Natural Area. The prescriptions call for salvage thinning in alternatives 1,2, and 3, and Individual tree selection in Alternative 4.. See pp. 154-155 of the FEIS for the effects of salvage thinning and pp. 160-161 for individual tree selection. The integrity of the boundary will be maintained.

Comment 129-72

11. The ADP believes that, out of concern for the future designation of a Tionesta Wilderness area, all cutting units and all other resource extraction activities associated with the East Side Project within the following grid units from the East Side EIS Index Map should be immediately and wholly withdrawn from consideration: H9, H10, H11, H12, I9, I10, I11, I12, J9, J1O, J11, J12, K9, K1O, K11, K12. The only resource management activities that should go forward under the East Side Project within this area bounded by highways 6, 66, and 948, and the communities of Kane, Ludlow, and Sheffield, with the Tionesta Scenic and Research Natural Areas as its core, are the permanent closure and obliteration of existing forest roads. The visionary management strategy outlined above does not fall "outside the scope" of the East Side Project.

Please see the Purpose and Need section of Chapter 1. Also, see Comment 129-69.

Comment 129-73

1. Forest Service research indicates dead and decaying wood accounts for about 25% of a forest's biodiversity (Maser and Trappe). The impact of removing trees on this component of the forest ecosystem needs to be considered. The Forest Service generally contends that trees are somehow wasted when they die. If the trees die, they need to be allowed to fulfill their function and be recycled back into the ecosystem. Past timber harvesting activity in the East Side Project Area has removed much potential for large woody debris (hereinafter, "LWD") contribution to the forest floor. This LWD (commonly defined as woody material at least 10 cm in diameter and two meters in length), or "nurse logs" would reduce erosion, positively effect soil development, store essential nutrients as well as water which is valuable to the ecosystem in times of drought, provide a source of energy flow, serve as seed beds, and provide habitat for decomposers. The Zero-cut alternative for the East Side Project should be selected out of concern for these values.

Effects of timber harvest on nutrient cycling, soil fertility, dead wood recruitment and the availability of dead wood for wildlife are discussed on pp. 48, 63-64, and 66 of the East Side EIS, and 107-108 of the Forest Plan FEIS. Based on the analysis provided, there are no significant effects anticipated. The commentor's preference for the no action alternative is noted.

Comment 129-74

2. Please explain how removing ecological stages of trees, which would be better for the health of the system if left to follow their natural cycle as living contributors to forest health, planting non-native grasses, using herbicides that are toxic to non-target organisms, building roads and disrupting soil chemistry is restoring native understory conditions.

"Leaving all ecological stages of trees" and "following their natural cycle" is analyzed in the no action alternative (Alternative 1). While dead and decomposing trees do contribute to the cycling of nutrients, they will not substantially change the conditions of the understory or "restore native

Comment 129-74 cont.

understory conditions". Where interfering vegetation exists, and deer browsing has eliminated most of the understory vegetation, experience has shown that herbicide application to treat interfering vegetation and exclosure fences for deer are necessary to affect a change in understory conditions.

Comment 129-75

3. LWD contributions to streams and rivers has been shown to be highly beneficial to the health and diversity of forest ecosystems in many regions. A recent study on the Allegheny demonstrated that brook trout populations are healthier and more diverse in a stream with high LWD content which runs through old growth forest than in a section of the same stream which has been logged over and which has little to no LWD (Terrick 1996). The Zero-cut alternative for the East Side Project should be selected out of concern for LWD contribution to stream health. At the very least, stream buffers could be left throughout the East Side Project Area according to the site potential tree height along the stream (certainly at least 100' buffers would be necessary). This would ensure future I" contributions to streams in the East Side Project Area.

Page 4-19a of the Forest Plan recognizes the importance that in stream large woody debris has on stream systems by providing two standard and guidelines. One standard states managing streamside areas for the recruitment and long-term maintenance of 75-380 pcs. of in stream large woody debris per stream mile in cold-water streams, and 75-200 pcs. per stream mile in cool- and warm-water streams. The second standard states to "provide a sufficient number of biological mature trees growing along streams to provide for long-term input of large woody debris." On page 19, there is also a standard that states " Preferential consideration will be given to riparian dependant resources in riparian areas and in the area 100 feet from either edge of perennial streams and other water bodies." The ANF provides for buffer strips to prevent the warming of stream water (pp. 4-19 and 4-25), which also provides potential large woody debris to streams. In summary, the Forest Plan recognizes the importance that large wood has to stream systems, and has set standards for accomplishing this within 100' of streams.

Please see Mitigation Measures WA1 and WA2 in Appendix D of the East Side EIS.

Comment 129-76

4. The Forest Service has absurdly conflicting agendas for the East Side Project when it comes to white-tailed deer (Odocoileus virginianus). The Forest Service on one hand decries an overpopulation of deer that overbrowses the forest understory in many places of the Allegheny. However the Forest Service also emphasizes the need to produce deer for hunting in MA 3.0. Approximately 82% of the East Side Project is made up of MA 3.0. The Forest Service should select the Zero-cut alternative to prevent eating clearcut conditions which deer show an affinity for browsing in, and which would only further inflate deer populations on the Allegheny. The relationship between even-aged management and increased deer populations has been very well documented. Even a recent research project conducted by the Forest Service supports this fact:

> The second round of cutting within the Porter's Prize Project Area was completed in 1997. Two pellet group surveys of this area during the spring of 1998 suggested a mean overwintering deer density in the area of 31.2 deer per square mile, up from the 1997 estimate of 23.3 deer per square mile.

As a result of intensive even-aged forestry, very similar to many of the proposed cuts in the East Side Project Area, deer populations increased by 34% in one year. This indicates a major conflict between the use of even-aged management and the emphasis on deer that are both major objectives for MA 3.0. In fact, the issue of rising deer populations has become so contentious in the region that nearly any conference on wildlife becomes a conference on deer. Even the PA Game Commission is saying that there is a major problem that needs to be addressed through new methods. To make matters worse, the use of even-aged management is creating a deer density on the Allegheny that is prejudicing against opportunities to pursue uneven-aged cutting in the future in these areas. The East Side EIS needs to take a detailed look at this conflict. The Forest Service needs to revisit the user conflict created by the two major conflicting goals of MA 3.0 which emphasize both even-aged cutting and deer populations - two goals that have become increasingly incompatible.

The white-tailed deer have been influential in shaping the pattern of vegetation that presently occurs on the forest. Deer pressure is still a factor considered when silvicultural treatments are implemented and methods are used to reduce this occurrence to ensure regeneration of forested stands. However, the direct reduction of deer populations occurs from hunting pressure and providing the habitat needed to maintain viable populations for each indicator species, game and non-game, is a Forest Plan direction. See page 4-29 Forest Plan and 195 FEIS.

Comment 129-76 cont.

White-tailed deer and turkey are emphases species in management area 3.0, however, the maintenance of habitat to support viable populations is not mutually exclusive from the regeneration of forested stands. The acres of openings, temporary openings and 0-10 year vegetation was determined for the Forest Plan in order to successfully meet all objectives in each management area.

Also, see Comment 141-4.

Comment 129-77

5. The Forest Service must maintain 10% of MA 6.1 as old-growth conditions. This does not mean 10% in total across the Allegheny, but a homogenous 10% old growth composition across MA 6.1 in the Allegheny at a minimum. Every 100 acres of MA 6.1 must have a minimum of 10 acres of designated old-growth. All East Side timber extraction activities that fall within MA 6.1 must be wholly withdrawn from consideration in order to maintain viable levels of old-growth in these areas. The East Side EIS must contain an analysis to see how each alternative impacts achievement of this Desired Future Condition.

There is no timber harvest proposed in MA 6.1 in any alternative. The only management activities proposed in MA 6.1 are reforestation treatments designed to restore forest cover in areas severely impacted by mortality and decline, where seedling regeneration does not currently exist.

Approximately 16% of the project area is being managed exclusively to provide mature and late successional forest and 10% of this is MA 6.1 (pp. 190-191). Additionally, there are presently 4,189 acres of 111 year old forest and an additional 22% of the project area in the 91-110 year-old age class that will be available to provide future late-successional/old growth habitat. As a result, the amount and distribution of old-growth habitat identified in the Forest Plan will be achieved under all alternatives.

Comment 129-78

Just as the pro-logging Forest Service believes that "there are many varied economic, contractual, biological and sociopolitical reasons that support ... implementation ... of previous decisions," we believe, and there is a large consensus of agreement from the scientific sector, that there are many varied economic, contractual, ecological, and sociopolitical reasons not to implement these previous decisions including the East Side Project.

Comment noted.

Comment 129-79

These reasons are partially detailed in this letter. The Forest Service should note, however, that given the time constraints it was impossible for us to include all of the reasons here. For that reason, the Forest Service should try doing a literature search within economics journals. It would be enlightening. Probably the best way for the Forest Service to learn about economics would be to begin with "Assessing Economic Tradeoffs in Forest Management" (PNW-GTR-403) which was specifically prepared to assist the Forest Service in making these types of decisions. The ADP also believes that the Forest Service should review the 1998 International Journal of Social Economics article "Markets and Biodiversity Loss: Some Case Studies and Policy Considerations" by Carl McDaniel and John M. Gowdy. Copies of this article can be provided to Forest Service personnel free of charge upon request. The fact of the matter is that the logging of our national forests is explicitly costly to taxpayers, national forest communities, and to the development of local, regional, and global economies that are sustainable.

Comment noted.

Comment 129-80

Few come to the woods to see how the pine lives and grows and spires, lifting its evergreen arms to the light, to see its perfect success. Most are content to behold it in the shape of many broad boards brought to market, and deem that its true success. The pine is no more lumber than man is, and to be made into boards and houses is no more its true and highest use then the truest use of man is to be cut down and made into manure. A pine cut down, a dead pine, is no more a pine than a dead human carcass is a man.

Is it the lumber man who is the friend and lover of the pine, stands nearest to it, and understands its nature best? Is it tanner or turpentine distiller who posterity will fable was changed into a pine at last? No, no, it is the poet who makes the truest use of the pine, who does not fondle it with an axe, or tickles it with a saw, or stroke it with a plane. It is the poet who loves it as his own shadow in the air, and lets it stand. It is as immortal as I am, and will go as high a heaven, there to tower above me still. Can he who has only discovered the value of whale-bone and whole-oil be said to have discovered the true uses of the whale? Can he who slays the elephant for his ivory be

Comment 129-80 cont.

said to have seen the elephant? No, these are petty and accidental uses. Just as if a stronger race were to kill us in order to make buttons and flageolets of our bones, and then prate of usefulness of man. Every creature is better alive than dead, both men and moose and pine-tress, as life is more beautiful than death.

H. 0. Thoreau

This is a quote.

Comment 129-81

1. In particular, the economic analysis for the East Side Project must follow an analysis strategy such as that described in the Forest Service report "Assessing Economic Tradeoffs in Forest Management" (PNW-GTR-403). This report is the first one from the Forest Service to truly attempt to incorporate current economic thought into the Forest Service's economic analyses. It is truly a good starting point. The economic analysis should consider the most recent information (the best available information) published by professional economists. An example of how different economic sectors influence each other is the Flathead National Forest. The following chart displays the relationship between timber sales and employment on the Flathead National Forest. As you can see, like the Allegheny National Forest area, demand for non-timber resources is rapidly increasing. Unfortunately, high levels of timber cutting could hurt our economy by harming these trade-offs. In order to see our full economic potential it is essential that we stop commercial logging on the Allegheny.

Figure 7-3 did not reproduce. See letter 129 p. 42 in the project file.

The information related to economic analysis contained in the PNW-GTR-403 publication titled "Assessing Economic Tradeoffs in Forest Management" is directed at the scope of a Forest Plan and evaluating tradeoffs of Forest management alternatives. The abstract reads:

> **"Method is described for assessing the competing demands for forest resources in a forest management plan by addressing economic values, economic impacts, and perceptions of fairness around each demand. Economic trends and forces that shape the dynamic ecosystem-economy relation are developed. The method s analysis of a forest management decision in the southern Appalachian Mountains."**

The scope of this decision to be made for the East Side project, Chapter 1, Purpose and Need and Chapter 2, Alternatives and the subsequent economic analysis, Chapter 3, Economics, do not look at Forest Plan level alternatives, but at the economic effects of implementing site specific activities to meet Forest Plan DFCs. The purpose of the economic analysis in the East Side FEIS is to compare the relative cost/benefits of all the alternatives considered in detail. See Chapter 3, p. 255.

The figure submitted with this comment comparing the timber sale program on the Flathead National Forest and jobs is noted. The economies on Montana and northwestern Pennsylvania are not necessarily the same.

Comment 129-82

1. The trees purchased off of the Allegheny are subsidized, and are therefore more economical for harvest than regular market prices. The result is that when logging levels are high on the Allegheny, payments to private land owners for their timber is low, and when logging levels are low or zero on the Allegheny, private land owners' prices are high. Decisions to log our national forest costs local private land holders. The economic analysis for East Side Project must consider impacts to the revenue received by private land holders for their timber. Considering only the revenue received by the Forest Service from East Side Project, and not the effects on private woodlot owners creates an arbitrary analysis (one that concludes without analysis that a timber sale is good for the American public by virtue of simply ignoring all negative aspects of the decision to sell public trees). When all publicly subsidized timber harvesting on the Allegheny was halted for six months during 1999, timber from private land became significantly more valuable such that "...the usual $2,505 the forest fetches per thousand board feet of [black cherry] wood established a record - $4,056 per thousand board feet" (Prize Hardwoods Fetch a High Price 2000).

The timber sale program on the Allegheny National Forest is not subsidized. Timber sales are sold to the highest bidder and subject to the same free market conditions as timber harvested from private lands. It is possible that the commentor could be mistaken as to the source of the bid of $4,056 per thousand board feet. Kathe Frank, Public Information Offer on the Allegheny National

Comment 129-82 cont.

Forest was quoted in a local newspaper (Prize Hardwoods Fetch a High Price 2000) when a bid of $4,056 per thousand board feet for black cherry timber was received by the Allegheny National Forest.

Comment 129-83

1. According to a report published by Chad Hanson, Executive Director of the John Muir Project and a Sierra Club Board Member, there is no return to the U.S. General Treasury from the national forest timber harvesting program. Hanson quotes the Congressional Research Service: "essentially NO timber sales receipts were deposited in the General Treasury in FYI 996 to offset timber program expenditures" [emphasis in original] (Hanson 1998). The economic analysis should acknowledge that while money goes into the Allegheny timber program from the General Treasury, none or little of it is returned to the General Treasury. This equates to a loss to taxpayers equal to that budgeted from the General Treasury. The analysis for the East Side Project should consider taxpayer interests by calculating the cost to U.S. taxpayers of implementing each alternative of the East Side Project.

The Allegheny National Forest does return timber sale receipts to the treasury. For example in 1996, the ANF returned $25,000,000 to the treasury. Expenses for the timber program were 11.5 million dollars, which included 25% payments to counties. The net return to the treasury was 13.5 million dollars. This is representative of recent years and indicates that the ANF timber program returns to the treasury are very large and far exceed the associated costs.

The cash flow analysis on p. 259 uses average planning costs and revenues and is designed to show the relative difference between alternatives.

Comment 129-84

2. Total expense for appeals/litigation for the Forest Service timber program for FY 1997 was $2,573,000, or just less than one half of one percent of the overall timber program budget according to the National Summary, "Forest Management Program Annual Report" for FY 1997. In other words, the costs of implementing the NEPA process are minimal at best. Therefore it makes no sense for the Forest Service to deny public participants good legible maps because of "costs." Therefore all timber sale maps should be produced at legible and usable scales allowing for the best participation of the public.

The East Side FEIS includes a set of maps that are adequate to locate site-specific stands and other project proposals. See East Side Map Set. Timber sale maps are not produced until the NEPA process is completed for a project area.

Comment 129-85

3. The logging program on our national forests is costly to taxpayers. The costs of restoration from flood damage caused in part by excessive sediment movement from logged areas is incurred either by local citizens or local, state, and federal taxpayers. In addition, American taxpayers paid $1.2 billion in fiscal year 1997 that they never saw again to help subsidize the logging program on our national forests, including the Allegheny. These monies were administered from the General Treasury while virtually no monies were returned (Hanson 1998). The No Action alternative for the East Side Project should be selected because it is not in the best interest of American taxpayers to liquidate their trees (ecological inventory) for short term monies for private industry that taxpayers will never see.

No flood damage has occurred as a result of logging on the Allegheny National Forest. As stated in Comment 129-82, timber sale activity is not subsidized on the Allegheny National Forest. See the Record of Decision for the rationale for the selection of the preferred alternative.

Comment 129-86

4. According to the *1997 Annual Report for the Allegheny National Forest*, approximately $4 million was spent on the timber program from the General Treasury. This is essentially lost money for the U.S. taxpayer because none of these funds are returned to the General Treasury. How much of the General Treasury will be spent on the East Side Project? This should be marked as a loss to the U.S. Taxpayer in your economic analysis. The *1998 Annual Report for the Allegheny National Forest* shows that the Forest Service lost money implementing timber sales in Fiscal Year 1998.

Comment 129-86 cont.

Comment noted. See Comment 129-83. As explained on p. 71 of the 1998 Monitoring and Evaluation Report, timber offer dropped from 52.6 MMBF to 8.6 MMBF from 1997 to 1998.

Comment 129-87

1. Our publicly owned forests make up less than 20% of Pennsylvania's forestland. However, these lands shoulder a disproportionately large portion of the burden of protecting native wildlife, biological diversity, recreation, scenery, non-timber forest products, and a host of other values associated with unmanaged ecosystems. There are significant economic and ecological tradeoffs made when non-timber values are foregone for decisions that promote timber extraction.

Comment noted. See the Purpose and Need section of Chapter 1. Please refer to the Forest Plan and the accompanying FEIS for discussions regarding the economic and ecological tradeoffs between varying levels of timber harvest.

Comment 129-88

2. It is not clear how the Forest Service intends to promote timber as the salvation to our local economic woes. To the contrary, timber and other resource extraction techniques are the woes of our local and regional economies. They create a dependency on corporate bosses while destroying our greatest economic resources, which, used in a more ecologically respectful manner (such as is done through preservation techniques) would promote a more autonomous and self-sufficient economy. Autonomy and self-sufficiency are vital to a healthy, sustainable local economy. The implementation of the proposed stone pit extractions, road work, timber cutting, and herbicide spraying as part of the East Side Project is a means of destroying autonomy and self-sufficiency, and therefore our local economy.

Comment noted. Please see the Social and Economic sections of the Forest Plan FEIS.

Comment 129-89

3. The ADP is based in Clarion, Pennsylvania, a community which is widely known as the "Autumn Leaf Capital of the World." Timber extraction on the Allegheny is harmful to our economic base which is primarily one of scenic recreation and tourism. As a community that closely outlies the Allegheny we are harmed by timber cutting actions such as the massive East Side clearcut logging project.

Comment noted. The Clarion Autumn Leaf Committee has not commented on the East Side project.

Comment 129-90

We have been aware of our negative impact on biodiversity for many years, but our attempts at regulation have been based OD the assumption that markets, or enlightened intervention using market incentives, can sustainably allocate biological resources. Historical data, however, lead to the conclusion that private economic exploitation is incompatible with the sustainable use of biodiversity. ... Until we move from econocentric resource management to a policy whose goal is the preservation of the ecosystem integrity, biological resources will continue to be degraded,

.. A requirement for viable policies that protects biodiversity is the explicit recognition of the incompatibility between markets and ecological sustainability. In the long term we must manage biological species, and the ecosystems they inhabit, as elements of a biological system, not as abstract economic entities devoid of scale and reduced to the common denominator of money. –

Carl McDaniel and John M. Gowdy (1998)

This is a quote.

Comment 129-91

1. The economic analysis for the East Side Project is lacking in many areas. The analysis concerning the economic benefits of the natural forest, in particular, are wanting. For the East Side Project the Forest Service needs to abandon their use of dark age economic analyses to consider and incorporate the work of current economists. For example, modem economists have estimated that natural forests provide $4.7 trillion every year in "ecosystem services" (Talberth and Moscowitz 1999). Ecosystem services include flood control, regulation of agricultural and forest pathogens, mitigation of wildfire (this is especially true of the moist native Allegheny forests), pollination, and carbon sequestering (Talberth and Moskowitz 1999). These "ecosystem services" must be incorporated into the analysis.

The Forest Plan allocated management areas (MAs) and the primary purposes for each management area (see the Allegheny National Forest Land and Resource Management Plan, 1986 and the Purpose and Need section of Chapter 1 of the East Side FEIS). The economic effects of implementing the

Comment 129-91 cont.

Forest Plan (management direction for each MA) can be found in the FEIS for the Forest Plan. The East Side project proposes activities that are compatible with Forest Plan objectives for the MAs that make up the project area. The purpose of the economic analysis in the East Side FEIS is to compare the relative difference of the costs/benefits of all the alternatives considered in detail (See Chapter 3, pp. 255-261).

Comment 129-92

2. By law, the East Side Project must be shown to "best meet the needs of the American people... with consideration given to the relative values of the various resources" (16 U.S.C. 53 1), "to maximize their net social and economic contributions to the nation's well being" (16 U.S.C. 1606 (a), Statement of Policy), and to "maximize net public benefits" (36 C.F.R. 219.1 (a)). The Forest Service must meet these criteria in their analysis of the East Side Project.

The East side project complies with all laws and regulations. It is a project that implements the Forest Plan. Also, see Comments 129-88 and 129-91.

Comment 129-93

1. The economic analysis for the East Side Project must consider the economic value of the ecosystem services provided by the standing trees in the East Side Project Area. The East Side Project proposal intends to take an inventory (our trees) and deplete it. The lost inventory values need to be thoroughly incorporated into the economic analysis.

See Comments 129-88 and 129-91.

Comment 129-94

1. Historical accounts of the impacts of logging reductions on national forests support the fact that when we preserve our national forests we create more jobs. The timber industry has seen employment declines throughout the century. The slowest declines in employment actually occurred shortly after the Wilderness Act of 1964 was passed (Freudenburg 1998).

Comment noted. This is not a comment that is site-specific to the East Side project.

Comment 129-95

2. In fact, between 1979 and 1988, logging in terms of board-feet harvested in the United States increased dramatically, however employment in the wood products industry declined by 26,000 jobs. The trend in the timber industry has been towards automation.

Comment noted. This is not a comment that is site- specific to the East Side project.

Comment 129-96

3. A consensus report published by 30 economists in the Pacific Northwest found that when those national forests ended their logging programs to protect the endangered spotted owl (Strix occidentalis), employment rose by 18%. The economists specifically analyzed the time period from 1988 to 1994 (the logging moratorium was established in 1991) and found that not only did employment drastically rise but average income significantly rose as well.

Comment noted. This is not a comment that is site-specific to the East Side project.

Comment 129-97

4. More recently, ECONorthwest published a report entitled "The Sky Did NOT Fall: The Pacific Northwests' Response to Logging Reductions." This report specifically finds that "logging reductions on federal lands in the Pacific Northwest are an integral part of, and not an impediment to, the region's economic evolution" (Niemi et al. 1999).

Comment noted. This is not a comment that is site-specific to the East side project.

Comment 129-98

5. Reductions in timber sales on public lands have traditionally resulted in economic diversification of regions - a beneficial thing. The Bitterroot Valley in Montana experienced such a change. During the period of 1969 to 1989 timber sales declined by at least 50%. During the same period income in economic areas outside of the wood products industry significantly increased, nearly tripling (Powers 1996).

6. When timber sales on Montana's Flathead National Forest decreased by 98%, employment in that region increased by a stark 133% (Powers 1996).

Comment noted. This is not a comment that is site-specific to the East side project.

Comment 129-99

7. Early employment figures for the region show that while timber sales dropped to zero on the Allegheny in April of 1999, the following three months saw stabilized employment levels. In fact, employment figures for Forest County rose over those 3 months.

Comment noted. This is not a comment that is site-specific to the East side project.

Comment 129-100

8. The East Side Project analysis must consider the reduction in logging as it truly reflects on society - as a positive function. All of the relevant research must be given full consideration. For an example of how logging causes economic losses in other sectors of the economy, see the Forest Service report entitled "Assessing Economic Tradeoffs in Forest Management" (PNW-GTR-403).

This comment is beyond the scope of the East Side project. Also, see response to Comment 129-81.

Comment 129-101

1. In Fiscal Year 1997, the Allegheny Forest Service illegally appropriated 27% ($634,192) of its KnutsonVandenberg (hereinafter, "KV") funds into its own coffers. The result is that the Deciding Officer who has reviewed timber sales and will review whether or not to implement the East Side Project automatically has a tendency to select the pro-logging alternative simply because of the economic incentives created by this misappropriation of federal funds. Instead of these monies going into reforestation, they are being used to pay staff salaries. This is a violation of federal law on two counts: one for constituting an abuse of federal funds and second for creating an arbitrary and capricious bias towards the pro-logging alternatives (FSEEE 1997).

See the Record of Decision for the rationale for the selection of the preferred alternative. All laws and regulation regarding the use of Knutson Vandenburg "KV" funds will be followed.

Comment 129-102

2. The Association of Forest Service Employees for Environmental Ethics (hereinafter, "FSEEE") found that the Allegheny has a $600,000 annual bias towards cutting timber in the use of KV funds, which are illegally diverted into overhead (FSEEE 1997). Also, Sierra Club v. Thomas (105 F.3d 248 (6th Cir. January 21, 1997)) ruled that internal Forest Service budgeting prejudices the agency towards clearcutting. Any biases or conflicts that the Deciding Officer might have (in this case either Forest Supervisor John Palmer or District Ranger John Shultz) must be disclosed in their environmental analysis and decision regarding the East Side logging project. Please disclose this information as appropriate.

See the Record of Decision for the rationale for the selection of the preferred alternative.

Comment 129-103

3. How much in KV funds will be generated from the revenue received in implementing the East Side Project? How much of this will be used for overhead?

KV funds are not generated until a timber sale is sold. This information will not be available until individual timber sales are sold as the East Side project is implemented.

Comment 129-104

1.THE EAST SIDE PROJECT CANNOT PROCEED UNTIL THE FOREST SERVICE COMPLETES AN ENVIRONMENTAL IMPACT STATEMENT ON THE NATIONAL FOREST SYSTEM LOGGING PROGRAM AS A WHOLE. The NEPA clearly envisions a multi-layered assessment of all agency policies and programs that have a significant effect on the environment. It is beyond dispute that the national forest system logging program meets the test for significance (40 CFR 1508.27). The required assessment of the program should be accomplished through tiering environmental analyses at the local, or project level with EISs on broad, national level policies and programs (40 CFR 1502.20; 1508.28). It does not matter that the national forest system logging program is currently being implemented, because NEPA must be "infused into the ongoing programs and actions" of the Forest Service, as well as new regulations, plans, or project proposals (40 CFR 1502.1).

a. This assertion does not fall "beyond the scope" of the East Side Project.

2. To date, the Forest Service has escaped review of many significant decisions related to the national forest system logging program by breaking up the program into small pieces and completing EAs or EISs on individual sales or forest plans. The national level policies, procedures, and actions omitted from NEPA assessment have significant environmental consequences because they guide the analysis of all individual timber sales, provide the rationale and justification for all individual timber sales, and establish administrative incentives to make the timber sale program as large as possible. They include:

a) budgetary decisions and policies including the appropriation of funds for regional timber sales and the decisions regarding use of KV funds for administrative costs;

b) timber sale accounting procedures;

c) standard models used to complete economic and environmental analysis of forest plans and timber sales; d) national timber sales targets and national assessments of supply and demand for timber as well as other forest resources, and;

e) internal reward and promotion guidelines that provide incentives to meet timber targets.

3. To properly follow NEPA, the Forest Service must disclose how these and other national level policies, procedures, and actions are related to implementation of the East Side Project, and tier the decision to implement the East Side Project to an EIS addressing the national forest system logging program as a whole. In the absence of the national level EIS, the Forest Service must suspend implementation of individual timber sales, including the East Side Project, to prevent the commitment of "resources prejudicing selection of alternatives" for managing the national forest system logging program, including an alternative that considers no logging program at all [40 CFR 1502.2(f)].

4. The decision to avoid preparation of a program-wide EIS violates NEPA as well because there are significant cumulative effects of the program which are hidden at the scale of an individual timber sale or national forest, but visible only at the scale of an entire region, or, nationally. These include many of the economic effects identified above, especially those related to the market barriers erected against alternative fiber businesses and small scale foresters using ecological forestry methods, and those related to increased wildfire. Effects on global climate are similarly invisible at the scale of a project, but extremely important when the program as a whole is considered, and must be considered by the Forest Service.

5. Also, the effects of the national forest system logging program on private timberland management must be considered at a national scale as previously mentioned in these comments. In many regions of the country, the Forest Service's supply of high value sawtimber provides a disincentive for managing private lands under long rotations and selective harvest methods. By filling the market niche for large diameter trees, the Forest Service is a contributing factor in the rapidly escalating use of short rotation clearcutting on private lands. A prohibition on selling national forest timber coupled with a vastly expanded cooperative forestry program that provides financial incentives for long rotation, large diameter management on private lands is one of the policy alternatives that must be studied by the Forest Service in the nationwide EIS.

6. Each of the effects noted above requires analysis by the Forest Service because they fall squarely within the definition of direct, indirect, and cumulative effects as well as connected actions described by NEPA (40 CFR 1508.7, 1508.8,1508.25), and are significant at a broad national or regional scale.7. Case law supports the need for economic analyses to consider "non?use" values. (See, e.g., Ohio v. United States Department of Interior, (880 F.2d 432, D.C. Cir. 1989)). Therefore the East Side Project

Comment noted. However, it is beyond the scope of the East Side project. This project implements the Forest Plan, which was created by the direction of the National Forest Management Act.

Comment 129-105

1. THE EAST SIDE PROJECT FAILS TO MEET NFMA REQUIREMENTS REGARDING MANAGEMENT OF NATIONAL FOREST SYSTEM LANDS FOR THE HIGHEST NET PUBLIC BENEFITS. The NFMA requires management of national forest system lands in a manner that "maximizes long term net public benefits" [36 CFR 219. 1 (a)]. The Forest Service's planning regulations have defined the term "net public benefits" as the "overall value of positive effects (benefits) less all associated inputs and negative effects (costs)." The NFMA requires a sophisticated consideration of benefits and costs, including use of both market and non-market methods of determining existing and future resource values, methods to determine opportunity costs, and use of best available quantitative and qualitative techniques [(36 CFR 219.12(c);219.12(f)2;219.1(b)12]. Costs and benefits must be assessed not only from the perspective of the Forest Service, but from the perspective of "all other private and public" interests (36 CFR 219.12(g)3i). Economic considerations relevant to forest planning apply equally to the national forest system logging program as a whole, individual forest plans, and individual timber sales (36 CFR 219.27(b)l).

2. In preparing the East Side Project, the Forest Service failed to meet the substantive requirements regarding economic analysis set forth in the NFMA. Specifically, the Forest Service failed to incorporate a wide range of external economic costs that will be passed on to public agencies, private landowners, business owners, and others adversely affected by proposed logging in the East Side Project Area in combination with other timber sales ongoing and planned across the Allegheny, Region 9, and the national forest system as a whole. These include:

a) costs associated with wildfires that originate in national forest timber sale areas and are primarily caused by logging or the slash left over by logging operations. Historical data are available that can relate past timber sales on national forest lands with wildfires, and economic models are available to assign individual timber sales a risk or cost factor associated with potential future fires;

b) decreased private property values in the Allegheny River, Clarion River, and Tionesta Creek watersheds attributable to lost scenic, aesthetic, and recreational values on the lands affected by the East Side Project and other timber sales in the Allegheny, Clarion, and Tionesta watersheds;

c) lost business and revenue incurred by those engaged in the manufacturing, distribution, and sale of alternative fiber products who face competition from subsidized public timber sales;

d) lost business and revenue incurred by those engaged in ecologically sensitive timber harvest on private lands who face unfair competition from subsidized public timber sales implemented under less costly, less ecologically sensitive practices such as those proposed for the East Side Project;

e) costs incurred by county and state governments related to repair and maintenance of roads damaged by log trucks;

f) costs incurred by county and state governments as well as private individuals related to loss of life or personal injury from collisions with or accidents caused by logging trucks transporting logs from national forest system lands;

g) lost revenue and jobs incurred by those engaged in businesses related to recreation, fisheries, tourism, and other non-timber forest uses that will be precluded by the East Side Project. Even if the site specific effects of the East Side Project on these uses are small, the cumulative effects of this sale in combination with all others in the Allegheny, Clarion, and Tionesta watersheds may significantly alter the aesthetic attraction of the entire watershed to the point where business related to non-timber uses are no longer viable;

h) lost long term hydro-electric generating capacity in all downstream facilities (including the Clarion

i) increased filtration costs incurred by the local comunities' water purification plants attributable to the increased sediment load created by the East Side Project and all others in the Allegheny and Clarion River and Tionesta Creek watersheds.

3. If these costs are to be analyzed in the context of the East Side Project, it would likely fail to meet the test of "cost practicability" required by the NFMA (36 CFR 219.27(b)7). The Forest Service must revisit the economic analysis in the East Side Draft EIS, and complete the necessary qualitative and quantitative assessment to incorporate the costs identified above as well as all other external

Comment 129-105 cont.

economic costs. If costs cannot reasonably be assessed on an individual timber sale basis, then the Forest Service must first complete the analysis on a national, regional, or watershed scale and then assign a proportion of these costs to individual sales using established quantitative methods.

Comment noted. This comment is beyond the scope of the East Side project since the CFR regulations cited are for Forest Planning and East Side project is Forest Plan implementation. Also, please see the response to Comment 129-106.

Comment 129-106

4. In addition, the East Side Draft EIS is in violation of NFMA economic analysis requirements since it fails to adequately discuss or assign value to a wide range of ecosystem services performed by intact forests in the East Side Project Area. To meet the letter and intent of NFMA, the Forest Service must analyze the market and non-market benefits of unlogged forests in the East Side Project Area including:

a) their role in regulating the flow of water in the Tionesta Creek and Allegheny River watersheds, specifically, their role in mitigating flash floods and other catastrophic precipitation events;

b) their role in purifying water for downstream users;

c) their role in maintaining long term forest productivity. Forests in the East Side Project Area provide a source of native organisms and ecological processes vital to regeneration and forest development in surrounding areas. In addition, the older and larger trees in the East Side Project Area are a genetic reservoir of immense value to future forests in and around the vicinity of the Eagle Mills project area;

d) the economic value of non-timber uses of the sale area including gathering of forest products, recreation, hunting, fishing, and wildlife observation, and;

e) their role in mitigating pests. The structurally diverse habitats in the East Side Project Area support bird and bat species that prey upon insects and rodents harmful to forest and cropland health.

5. The Forest Service must utilize 'state of the art' methods for calculating the market value of these and other ecosystem services provided by forests in the East Side Project Area. For example, an international team of scientists recently completed an economic assessment of the ecosystem services provided by 12 distinct ecosystems, estimating the annual market value of these ecosystems to be 33 trillion dollars (Nature's Services). Many other natural resource economists have devised quantitative and qualitative methods for assessing the value of ecosystem services.

6. The Forest Service must make use of these methods and incorporate ecosystem service value as a standard component of the agency's environmental assessment process. Failure to do so will artificially inflate the value of forests as timber relative to their role in regulating climate, purifying water, and supporting aesthetic or recreational uses. Until the East Side Project incorporates ecosystem service values, it cannot meet NFMA's mandate to properly assess the value of all forest resources and functions that have a market value (36 CFR 219.12(e) I ii, iii).

The title of 36 CFR 219.12 is "Forest planning-process". It is concerned specifically with matters of Forest Planning and not site-specific projects such as the East Side project. 36 CFR 219.12(e) is titled "Analysis of management situation" and states:

> **"The analysis of the management situation is a determination of the ability of the planning area as covered by the forest plan to supply goods and services in response to society's demands."**

36 CFR 219.12(e)(iii) sections (A), (B), and (C) all begin with the statement "For forest planning areas", and section (D) ends with the statement "identified during the planning process." This regulation, which clearly applies to forest planning and not to site-specific projects that implement the Forest Plan, is beyond the scope of the analysis done for the East Side project. The economic analysis presented in the FEIS (pp. 255-261) is adequate to show the relative differences between alternatives. Also, please response to Comment 129-105.

Comment 129-107

1. Recreation and tourism are vital economic forces within the "Allegheny National Forest Region" (Buck 1999a). In a February 3, 1999 Bradford Era newspaper article, reporter Jim Buck characterized the Allegheny as "obviously the centerpiece of that region." The benefits and costs of the proposed East Side Project, and their various parts, on the recreation and tourism aspects of our regional economy must be analyzed in detail.

Comment noted. See the Recreation section of Chapter 3.

Comment 129-108

2. The North Country Trail (hereinafter, "NCT"), a National Scenic Trail like the enormously popular Appalachian and Pacific Crest Trails, is administered by the National Park Service. The NCT will eventually extend over 4,000 miles from North Dakota to New York, spanning seven northern tier states. A nearly contiguous 95 mile segment of the NCT threads its way through the Allegheny, including through the East Side Project Area. Between 1996 and January of this year, membership of the North Country Trail Association (hereinafter, "NCTA") has grown over 400% (Menke 2000). There are numerous cutting units in East Side Project Area directly adjacent to or close in proximity to the NCT. This is completely unacceptable to the NCTA constituency and other casual NCT hikers.

Comment noted. Adaptive management silvicultural treatments, such as two-age management, are proposed along the North Country trail, rather than more conventional silvicultural treatments such as shelterwood/removal cut sequences. On August 16, 2000, ANF staff met with Bill Menke (NPS manager for the NCT), Bob Tait (PA NCTA Coordinator), and John Romanowski (USFS R9 NCT Coordinator) to review the 3 East Side units that are adjacent to the NCT. The group felt the treatments and mitigation prescribed were appropriate to protect the values of the NCT. The recreation and visual quality sections in Chapter III describe the effects of proposed activities in each alternative on the NCT.

Comment 129-109

3. The ADP believes that until such a time when a Zero Cut policy is enacted Forest-wide on the Allegheny, a two mile wide corridor (one mile to either side of the trail) along the entire length of the NCT in the Allegheny should be established where no timber harvesting, road construction or reconstruction, or any other resource extraction activities of any kind should be conducted in order to protect this National Scenic Trail in perpetuity.

a. This policy should be enacted immediately, and would preclude all resource extraction activities, with the exception of road closure and obliteration, for the East Side Project; i.e. the Zero-Cut alternative should be chosen for this project based on concern for the NCT corridor.

The Comprehensive Plan for Management and Use of the North Country Trail states "It is not the intent to completely isolate the user from land use practices surrounding the trail, but rather to allow the traveler to enjoy the mosaic of resources and land uses through which the trail passes. Thus, even resource management activities such as timber cutting, and even occasional clearcutting are not out of harmony with the management of the North Country Trail (USDI, National Park Service, 1982. p. 26)." The ANF has established a visual quality objective of retention and partial retention for the North Country Trail. Chapter III describes the effects of proposed activities in each alternative on the NCT. Also, see the mitigation measures in Appendix D.

Comment 129-110

4. Check out these examples of how the NCT is treated within the Duck/Sheriff Project Area (a recent and ongoing project). This type of activity must be considered within the cumulative effects section of the East Side EIS. Cutting along the NCT is prominent within a number of projects including the East Side sale. How do these cumulatively impact the experience of thru-hikers on the NCT?

Figures 8 and 9.did not reproduce. See letter #129 p. 50 in project file.

See the Cumulative Effects discussion in the Recreation section of Chapter 3.

Comment 129-111

5. "In 1998, ANF managers figure 3.9 million 'recreational visitor days' were logged on the 513,000-acre forest" (Buck 1999a). Recreation Visitor Days (hereinafter, "RVDs") are a unit of measurement equivalent to one person recreating on the Allegheny for 12 hours (USFS 1986). Taking a conservative estimate, if every visitor stayed one week, this equates to well over 500,000 people who visited the Allegheny in 1998. These visitors contribute significantly to the local economy according to the Forest Service. Impacts of proposed timber cutting must be analyzed to determine how losses of visitors could negatively effect the local economy. Figure 10 demonstrates the significantly growing trend of recreation use on the Allegheny. RVDs for 1999 were likely well over 4 million, but it is hard to say for sure as the data is unavailable from the Forest Service. Curiously enough, just as final RVD figures have been more and more conclusively demonstrating that recreational use of the Allegheny as a strongly growing trend, the Forest Service has stopped recording RVDs. According to Allegheny

Comment 129-111 cont.

spokesperson Dale Dunshie, "In 1999, we did not complete a use estimate for 1999 because of the impending change nationwide for recreation use measurement on National Forests. The Allegheny is scheduled to implement this new use measurement system call [sic] the National Recreation Use Study, in October of this year" (Dunshie 2000). Please provide the adp with an accurate RVD tally for 1999.

Figure 10 did not reproduce. See letter #129 p. 52 in project file.

A National Recreation Use Monitoring effort is currently underway in the Forest Service to collect data in a statistically valid manner. Twenty five percent of National Forests will participate each year for the next four years. The Allegheny National Forest is participating in the second year of this project in fiscal year 2001. In the past, the quality of the data collected by National Forests varied greatly leading to serious questions as to the reliability and consistency of the data. At the end of FY 2001, we will have an accurate view of the kinds and amounts of recreation use on the ANF, as well as some information on visitor satisfaction and economics. This scientific approach to collecting use information will yield much more credible results and will be invaluable for making management decisions.

Comment 129-112

6. Recreation and tourism contributions to the local, regional, and national economies are far more significant than the contributions from timber extraction. The most conservative estimates put recreation contributions at double those of timber. On the Allegheny, a Forest Service pamphlet entitled "Economic Impacts of the Allegheny National Forest" shows that Allegheny-based recreation contributes 1,600 jobs and $111 million to the local economy, while timber contributes only 722 jobs and $42.6 million to the local economy. The differences are stark, especially with recreation use on the rise. Recreation use was up 18% in 1998 from the previous year (Buck 1999a). Figure 11, taken from a March 1997 National Geographic article, demonstrates this overall trend of growing importance of recreation in our national forests against the diminishing importance of timber harvesting.

Figure 11 did not reproduce. See letter #129 p. 53 in project file.

Comment noted. Effects to Recreation are discussed in Chapter 3. The ANF handout referenced is outdated, and the statistics cited are no longer used. Current statistics are unavailable for the ANF, however, please refer to the article referenced in Comment 129-113.

Comment 129-113

7. Figures from the Draft Resource Planning Act Report of 1996 illustrate these differences still further. According to this report, recreation makes up 74% of the national forests' contributions to the Gross Domestic Product while timber makes up only 3%. Furthermore, 78% of the jobs produced from national forests are in recreation while only 2% area in timber. Harm caused to the recreation industry has far greater consequences than benefits to timber, and should be weighted heavily in the analysis of the East Side Project (Forest Service 1995: IV-2 to IV-3).

Comment noted. Effects to Recreation are discussed in Chapter 3.

The Forest Service reference cited in this comment (US Forest Service. 1995. The Forest Service Program for Forest and Rangeland Resources: A Long-Term Strategic Plan. Draft RPA Program) actually states the following: "In terms of direct, indirect, and induced employment effects, Forest Service programs accounted for an estimated 3.1 million jobs in 1993. That figure is expected to rise to 3.3 million jobs in the year 2000, and about 5.0 million by 2045 if identified Program needs are fully funded (Figure IV-2). This represents a 60 percent increase in jobs over the 50-year planning horizon. Most of the employment (99 percent) would be derived from the economic stimulus of increased resource outputs and from expenditures associated with management of the national forests and grasslands under this RPA Program. The composition of employment effects across specific Forest System programs is displayed in Figure IV-2. The reader will notice that this exhibits a pattern similar to the GDP effects described above. The trend towards increasing employment in the recreation, wildlife and fish sectors is consistent with the objective of diversifying rural communities. The relative value of a job supported by different resource programs can be determined using estimates of wage income and employment. The average wage compensation per job for selected National Forest System programs is displayed in Figure VI-3, Although the

Comment 129-113 cont.

economic impacts from the recreation program stimulated the highest absolute levels of employment for the GDP., comparisons on a per job basis show that the average wage income for recreation jobs lags behind wages associated with the minerals, timber, and, to a lesser extent, wildlife and fish jobs. The substantial employment generated recreation, wildlife and fish uses stems primarily from expenditures from goods and services by visitors to National Forest System lands. These consumer and service sector jobs tend to be more seasonal or part time in nature, in comparison to production and manufacturing jobs common to the timber and minerals development sectors. Higher average wage compensation can be expected from timber and minerals jobs."

Comment 129-114

8. According to the Explanatory Notes for the 1997 Forest Service Budget:

- In Fiscal Year (hereinafter, "FY") 1994 the Forest Service hosted over 835 million visits on National Forests, compared to 300 million by the National Park Service and 40 million by Disney
- Recreational use of the forests is at an all time high, and RPA projections indicate that use will increase over 50 percent by 2040.
- Over 2 million jobs are associated with the economic activity generated by recreation which is estimated to almost $100 billion annually
- Recreation fees to the General Treasury were $46 million last year. The timber program, by comparison, created 76 thousand jobs worth $2.7 billion and cost the General Treasury $278 million in 1994.

Comment noted. Effects to Recreation are discussed in Chapter 3.

Comment 129-115

1. According to a FOIA request performed by Heartwood, Inc. of Indiana, none of the Deciding Officers who oversee the Allegheny (Forest Supervisor and District Rangers) has chosen to implement a No Action alternative within the past 6 years. The Forest Service has clearly NEVER objectively considered the No Action alternative. If the deciding officer will not select the Zero-cut Alternative, then he should select the No Action alternative for the East Side Project.

Implementing the Forest Plan entails performing pre-NEPA analysis on many areas of the Allegheny National Forest every year. Resources such as recreation, vegetation, transportation, heritage, wildlife, soils, water quality, visuals, and socioeconomic are examined. Only those project proposals with the greatest need to be moved towards the DFC are moved forward to the point where a proposed action is formulated and NEPA is initiated through the scoping process. In essence, no action is selected for many potential project proposals in the pre-NEPA phase of planning. The No Action alternative is still a viable option in project proposals, however, the pre-NEPA analysis screens potential project proposals which makes the likelihood of the selection of the No Action alternative very small.

See the ROD for the reasons for the selection of the preferred alternative.

Comment 129-116

2. Given the inadequate range of alternatives provided, and the lack of supporting information for the alternatives that were considered, the No Action alternative clearly provides the greater net public benefits and provides the most optimal habitat for the PETS species when compared to Alternatives I to 4, including the endangered Indiana bat. Therefore, if the Forest Service does not select Zero-cut, they should select the No Action alternative for the East Side Project.

See the ROD for the reasons for the selection of the preferred alternative.

A summary of the determinations for all PETS species is provided on pp. C-42 and C-43 of Appendix C. It clearly states that the no action alternative (Alternative 5) may affect Indiana bats due to the long- term loss of optimal canopy conditions. Individual northern long-eared bats could also be impacted under Alternative 5.

Comment 129-117

3. The Forest Service is supposed to give equal consideration to the No-Action Alternative within the Draft EIS. This is something they do not do however. The Forest Service arbitrarily excludes the no-action alternative from detailed consideration. None of the vegetation tables, for example, in Appendix B give any thought to the site-specific outcomes of no management. How can it be said that the Forest Service is given no-action equal consideration when they do not even detail the projected stand by stand outcomes for Alternative 5 in Appendix B? It can not be said. That is the problem with the East Side EIS. Without given the no-action alternative detailed consideration the Forest Service can not draw a well-informed conclusion in terms of their choice of alternatives.

Alternative 5 was given equal consideration as Alternatives 1-4. The effects of the No Action alternative are discussed in Chapter 3 for each resource area in the Direct/Indirect sections for each resource. Please see the discussion on the effects of No Action on vegetation on pp. 169-171.

Comment 129-118

1. NEPA requires that the agency take certain actions to outreach to the public and obtain public input. Despite the significant interest in this timber sale, the Forest Service has done less than is legally required to reach out to the public in search of input. The Forest Service has lied to the public, refused public requests for a longer comment period, refused to hold any public hearings, and has incorporated by reference a pile of documents so voluminous so as to prevent their reasonable review within the time allowed for comment.

All procedural requirements have been followed during the NEPA process for the East Side project. Please see the Public Involvement and Issue Development section of Chapter 1 and Appendix A of the FEIS.

Comment 129-119

2. Instead of soliciting public comment aggressively for the East Side Project as required by the NEPA, the Forest Service has instead created obstacles that clearly make it more difficult for the public to participate in the process. The fallout of this process is that persons desiring to meaningfully participate in the process of implementing East Side timber sales will not have the opportunity to do so.

This comment is not clear as to what "obstacles" have been created in the East Side public involvement process. As stated in Comment 129-118, all procedural requirements have been followed and the details are described in Appendix A of the FEIS.

Comment 129-120

3. Some of the requirements of the CEQ Regulations that are being violated include:

> Make diligent efforts to involve the public in preparing and implementing their NEPA procedures
> 40 CFR § 1506.6(a).
>
> NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing
> NEPA.40 CFR § 1500. 1 (b).
>
> Federal agencies shall to the fullest extent possible: * * * (d) Encourage and facilitate public involvement in decisions which affect the quality of the human environment.
> 40 CFR § 1500.2.
>
> Agencies shall... (C) Hold or sponsor public hearings or public meetings whenever appropriate or in accordance with statury requirements applicable to the agency. Criteria shall include whether there is:
> (1) Substantial environmental controversy concerning the proposed action or substantial interest in holding the hearing.
> 40 CFR § 1506.6.

All procedural requirements have been followed during the NEPA process for the East Side project. Please see the Public Involvement and Issue Development section of Chapter 1 and Appendix A of the FEIS.

Comment 129-121

4. This section of the legally binding Forest Service NEPA Handbook is also being violated:

> Determine the methods of public participation. Establish the level of needed public participation. Ensure that the level of effort to inform and to involve the public is consistent with the scale and importance of the proposed action and the degree of public interest.
> 1909.15 FSH § 12.3(d)(2).

All procedural requirements have been followed during the NEPA process for the East Side project. Please see the Public Involvement and Issue Development section of Chapter 1 and Appendix A of the FEIS.

Comment 129-122

5. John Palmer acknowledges the need for public hearings

> "Many people with a wide variety of viewpoints are interested in the East Side project. We would like an open and honest discussion in the public forum about the issues, so we encourage anyone with questions to contacts us directly for facts about this project."
> John Palmer, Supervisor, U.S. Forest Service

Despite his admission, Palmer has denied repeated requests for public hearings. The Team Leader for the East Side project, Carl Leland, has told us that we do not hold "real interests." Questions in our letter on Scoping went unanswered. Or we were directed to large sections of the East Side Draft EIS that did not include the responses.

The Forest Service must do more to involve the public in the East Side process. The information distributed by the Forest Service is meant to cool public participation rather than promote it. Every comer you turn the Forest Service is downplaying their activities.

> The East Side Environmental Impact Statement (EIS) will analyze the environmental effects of proposed treatments in many different projects totalling 8,206 acres that are widely scattered over the 141,000-acre Zone of Mortality in the eastern and southern parts of the Allegheny National Forest. The East Side EIS is not "one big timber sale" as some have suggested.-
> East Side Executive Summary (emphasis in original)

This quote, for example, has the effect of giving the false impression that East Side is not a large project of connected actions that will have a significant effect on the environment. A concept which is directly contradictory to the purpose of preparing an EIS. You only prepare EIS documents where significant impacts to the environment are likely. If these "many projects" are not connected, but widely scattered, than the does not support the need for an EIS. But the truth is another thing. The proposed logging activities are heavily concentrated in a number of watersheds. For example, over 300 acres of logging will occur in the Crane Run watershed alone. 300 acres of cutting in a single watershed does not constitute activities that are in any sense "widely scattered." Instead such activities are heavily concentrated.

Please see Appendix A. A total of 242 letters were received from the public during the scoping period and a wide range of issues and comments were received. There was no compelling need for the Forest Service to hold public meetings in light of the large number of written responses received during scoping. A specific request for a public meeting would have been given due consideration had one been received requesting a time and place and an estimate of the public interest in attending such a meeting.

Carl Leland did not tell members of the Allegheny Defense Project that they held no "real interest". He told them during the May 17, 2000 Project File review that if they had a real interest in a public meeting that they should make a request for a time and place. A letter dated May 19, 2000 was received a few days later (see Project File, ADP letter dated May 19, 2000) with the following demand: "To specify our demand we state that Public Hearings must be held in Clarion, Pittsburgh, Philadelphia, Warren, and Buffalo, NY.".

See p.1, Background section for a discussion of why an EIS was prepared for this project proposal.

Comment 129-123

When people do initiate their own participation the Forest Service responds with arrogance, declaring their concerns and opinions as ignorant. This further cools public participation in the process. This statement made to a number of citizens who wrote in protest has that effect:

> Thank you for taking the time to share your strong feelings and concerns about the East Side project. In your letter, you say we should protect our National Forests by ending all commercial timber sales, stopping road construction, removing existing roads, and eliminating pesticides/herbicides. The East Side project is designed to do just what you advocate --protect and perpetuate our forests -- while responding to significant mortality throughout a portion of the Allegheny.
>
> - John Palmer, U.S. Forest Service

Ironically, this statement contradicts with directions given for responding to public comment in the Forest Service's "Content Analysis Guidebook." This guidebook emphasizes that "team members need to remain objective throughout the process." According to the guidebook, "This is the key to protecting he integrity of the public comments." Most important is this point made in the guidebook, "The respondent's reasoning is included regardless of the analyst's opinion about its logic or worth. Content analysis is meant to reproduce ideas, not evaluate them." Palmer, in the above quote, is doing exactly what the Guidebook says not to do. In his statement he immediately discredits people's opinions and re-enforces his own. But Mr. Palmer's job is not to enforce his own ideology on the public forests of America. Mr. Palmer is a public servant who is supposed to enforce the laws established by the American people to ensure that are public forests are not mis-treated. And Mr. Palmer is the very responsible party prepared to mis-treat the public forest lands that make up the East Side Project Area. Mr. Palmer's obstinance towards public participation is a direct result in his desire to get the cut out. Involving the public takes time - something Palmer refuses to do:

> "We are moving ahead as quickly as possible to complete the Eastside EIS."
>
> - John Palmer, 1998

The East Side fact letter was sent out to provide accurate information for the public to make informed decisions on projects covered in the draft EIS. Also, John Palmer is a strong supporter of the public participation process for making National Forest management decisions.

Comment 129-124

6. The NFMA also has its rules and regulations regarding participation in decision making on national forests. The parts of the requirements located at 36 CFR § 219.6 that apply to the planning process are also being violated.

The public participation process described in 36 CFR 219.6 is for Forest Planning. However, many of the attributes of (a)-(d) have been followed in the East Side process. Regulations For Implementing The Procedural Provisions Of The National Environmental Policy Act (40 CFR Parts 1500-1508) have been used for the East Side project. All applicable laws and regulations have been followed.

Comment 129-125

7. Amending the Forest Plan before proceeding with implementation of these projects is the only way to guarantee that they will comply with federal law.

The Forest Plan was amended on July 28, 2000.

Comment 129-126

> The national forests in the Appalachians contain formerly cut-over land that had been abandoned by railroad loggers. When the Forest Service began to purchase land in the 1920's and 1930's, the forests gradually returned to a semblance of their former greatness through management techniques which did not include clearcut logging...
>
> In the 1960's, though, clearcutting reappeared in the eastern forests accompanied by a storm of public indignation..
>
> Clearcutting is closely allied to even-aged management whose aim is to grow large stands of trees of approximately the same age (and often the same species) for simultaneous harvest. Carried out with modem machinery, extensive road networks, and frequently with a goal of maximum profit at the expense of ecological and aesthetic values, clearcutting may produce devastating impacts. -- David J. Robertson (1981)

Comment 129-126 cont.

A clearcut by any other name, such as 'even-aged management' or 'variable retention,' is still a clearcut.
--Julia Butterfly Hill (2000)

This is a quote.

Comment 129-127

1. The range of alternatives considered in the East Side Project analysis is inadequate. The No Action and Zero-cut alternatives clearly maximize suitable and optimal habitat for the Northern long-eared and Indiana bats. The No Action alternative is, however, arbitrarily dismissed without serious scrutiny. This ignores the fact that a new Zero Cut alternative that included alternative "improvements" (such as obliterating roadways instead of reconstructing" them) would be of maximum benefit to PETS species.

The range of alternatives was developed in response to issues raised during the project analysis (See Chapter 2).

The no action alternative does not clearly maximize suitable and optimal habitat for the Indiana and northern long-eared bats as suggested. Information presented in

Appendix C Tables 16 and 17 (BA, pp. C-35 & C-36), indicate that Alternative 5 (no action) will result in the lowest amount of suitable Indiana bat roosting and foraging habitat.

Please see Alternatives Considered But Eliminated From Detailed Study in Chapter 2 for a discussion of the Zero Cut alternative.

Comment 129-128

2. None of the alternatives in the analysis for East Side Project comply with Curry v. U.S. Forest Service which mandates that a full uneven-aged alternative be considered in detail before the Forest Service can select an even-aged action. This alternative could benefit PETS species by not subjecting them to as much destruction of habitat - as will be caused by the proposed removal cuts. The failure of the Forest Service to fully comply with this Court Order is a serious problem.

See the Background section of Chapter 1 and the Alternatives Considered But Eliminated from Detailed Study section of Chapter 2. Also, see response to Comment 129-127 and Appendix F.

Comment 129-129

3. How can the public expect the Forest Service to select the alternative that best suits the needs of PETS species? The Forest Service not only has a reputation of NOT selecting the No Action alternative EVER, but almost always selects the alternative with the maximum number of acres logged! In fact, of the first 9 supplements the Forest Service opened for public comment, 8 selected alternatives with the most acres logged, 7 of them selecting the maximum number of clearcut and even-aged acreages. In one case the No-Action alternative wasn't even considered. This kind of arbitrary and capricious decision making must be reversed for the public good! New alternatives for the East Side Project must be developed that consider a range of options for maximizing benefits to PETS species (as opposed to only minimizing harm) and comply in full with NEPA and NFMA as ruled upon in Curry v. U.S. Forest Service!

See the Purpose and Need section of Chapter 1. See Appendix C pp. C-30 through C-39 for a discussion of effects on PETS species. Also, see the Wildlife section of Chapter 3, p. 229 for a discussion of mitigation measures.

Comment 129-130

4. The Forest Service must analyze a new alternative for the East Side Project that considers maximizing optimal and suitable habitat for the endangered Indiana bat. A restoration alternative which would include zero logging and also encompass watershed protection actions would maximize protection for the endangered Indiana Bat while not compromising habitats of other species.

See the Purpose and Need section of Chapter 1. Also, see the Alternatives Considered but Eliminated from Detailed Study section of Chapter 2.

Comment 129-131

5. It is very important that the environmental analysis for the East Side Project consider a complete unevenaged management alternative. This is important to comply with the NEPA and the NFMA (see Curry v. US. Forest Service). It is also very important to note that uneven-aged management creates more optimal conditions for the Indiana and Northern long-eared myotis species than does even-aged management.

Although no cutting provides the most optimal habitat for bats on the Allegheny, uneven-aged management is far less destructive to Indiana bat and northern long-eared bat habitat than is even-aged management. Both Indiana bats and Northern long-ared bats have shown a preference for uncut forested areas over logged forested areas (MacGregor Personal Communication, Kurta and Foster 1999, Gannon 00). The Indiana bat has been shown to prefer canopy closures of at least 50% cover and less than 70% cover for foraging and 60%-80% for roosting (Forest Service 1998). The Indiana bat, however, has also shown a preference for uncut areas that may provide this habitat condition (MacGregor Personal Communication). Additionally, northern long-eared bats appear to use forest with higher canopy closure than even the Indiana bat does. This is important since the Northern long-eared bat is known to use the Allegheny extensively - perhaps because of the forest's current condition which is dominated by older closer canopies.

Please see Alternative 4, the Alternatives Considered but Eliminated from Detailed Study section of Chapter 2, Chapter 3, pp. 102-103 and 110, Appendix F, as well as the discussions of the effects of uneven-aged management in the various resource sections of Chapter 3.

We agree with the Indiana bat canopy closures for foraging and roosting habitat and have used them to assess suitable and optimal canopy closures in the project area (Appendix C Tables 16 & 17 pp. C-35 & C-36). However the Indiana Bat Draft Recovery Plan states that "Indiana bats live in highly altered landscapes and use an ephemeral resource (dead and dying trees) as roost sites….Conceptually, at least in the western part of the species' range, Indiana bat may have been a savanna species….they seem to prefer open canopies and fragmented forest landscapes." (P. C-9).

Comment 129-132

It is argued within the Draft EIS for Threatened and Endangered Species on the Allegheny and within the Draft EIS for the East Side Project that even-aged cutting is preferred because many methods of even-aged cutting reduce canopy closure to within optimal range for the Indiana bat. As stated, this optimal range is defined within the East Side Project BA as being between 50 and 80 percent canopy closure. There are several problems with this conclusion.

The first problem is that the Draft EIS for the East Side Project and the Draft EIS for Threatened and Endangered Species on the Allegheny both fail to address the factual implication of even-aged cutting methods that may result in canopy closures between 50 and 70 percent. The actual findings suggest that the median of resulting canopy closure is within that range of 50 to 70 percent canopy closure, but that canopy closure from even-aged cutting methods, especially salvage cutting methods, often results in canopy closures less than 50%. This fact however is not addressed within the environmental analysis.

This also fails to adequately address findings in other areas where Indiana bats are known to roost during the summer months. It is often cited by the Forest Service that John MacGregor has found Indiana bats roosting within shelterwood cuts. What has not been acknowledged is that MacGregor's data actually shows that Indiana bats are using uncut forested areas in that vicinity far more often than cut forest areas (MacGregor Personal Communication). It is also important to note that those bats may have been roosting in that area prior to cutting (MacGregor Personal Communication). If this is true, then that also supports the idea that Indiana bats prefer uncut forested areas over logged ones. If one considers that most of MacGregor's data shows Indiana bats using uncut areas (in a forested area where logged areas are widely available), then one must logically conclude that it is more likely that Indiana bats were using the shelterwood cut area prior to cutting than vice-versa. There is no indication from any of the data that the shelterwood created conditions that attracted Indiana bats to an area were not being used previously. Furthermore, MacGregor's data shows that Indiana bats do not use areas where final overstory removal of any kind have been completed. Indiana bats avoid these areas.

This is consistent with the finding that the Indiana bats will most often choose the least fragmented forest available to them for summer roosting (Pruitt 1999). This is supported thus far by the research conducted on the Allegheny. It appears that there is at least one roosting colony on the Allegheny - in the vicinity of Big Mill Creek (Gannon 2000). Although there is some disturbed forest to the west of this location, much of the forest to the east remains highly contiguous in nature. It is very likely that the roosts for this colony are within that unfragmented area.

Even if the assumption is made that cutting of forested areas is beneficial to the Indiana bats, the conditions created by uneven-aged cutting methods are far more optimal than those created by even-aged cutting methods for the Indiana bat. Both cutting methods result in canopy closures between 50 and 70 percent (Forest

Comment 129-132 cont.

Service 2000). The condition of even-aged stands, however, is very temporary whereas conditions for uneven-aged stands is more permanent.

There are several methods of even-aged cutting that could potentially result in canopy closure between 50 and 70 percent. These mostly include salvage thinning cuts, shelterwood cuts, and salvage sanitation cuts. The resulting MEAN canopy closures are 69%, 63%, and 68% using the Forest Service's methodology. All three of these cutting methods are temporary, however. In addition, salvage thinning cuts and salvage sanitation cuts target those trees actually preferred by the Indiana bat -- dead and dying trees.

The long term impact of even-aged versus unevenaged management on Indiana bat habitat is assessed by comparing Alternative 1 with Alternative 4 in Tables 16 and 17 of Appendix C pp. 35 & 36. Even-aged management (Alt 1) would result in 48% optimal roosting habitat and 27% optimal foraging habitat by the year 2019. Uneven-aged management (Alt 4) would result in 38% optimal roosting habitat and 29 % optimal foraging habitat. Also, see Comments 129-119 and 129-131 for references from the Recovery Plan.

Comment 129-133

Shelterwood Cuts-

The conditions created by shelterwood cuts are probably the most temporary conditions created by these methods of cutting. Shelterwood cuts are always followed by "shelterwood removal" clearcuts. In fact, the very point of the shelterwood cuts is that they be followed by "removal" clearcuts as soon as seedling regeneration is established. This most commonly takes between 3 and 7 years. Sometimes "removal" clearcuts can occur less than 2 years after the shelterwood cutting method is applied (such as is the case with some recent shelterwood cuts at Minister Valley). "Removal" clearcuts never occur more than 10 years post-shelterwood cutting. Thus, even if it can be said that shelterwood cuts created "optimal" conditions for Indiana bat roosting then it also must be acknowledged that these conditions are very temporary.

In fact, if it is true that shelterwood cuts create optimal conditions that might attract Indiana bats for roosting purposes, then it is also true that shelterwood cutting is also likely to contribute to higher levels of taking. Since it can be assumed that if shelterwood seed cuts do create these conditions ("optimal" habitat for the Indiana bat), then it can also be assumed that Indiana bats will occupy forested areas after shelterwood cuttings have occurred. The problem is that these areas will always be followed with "removal" clearcuts. Since there are no seasonal restrictions on cutting during the roosting season, the result is that Indiana bats will likely be killed during "removal" clearcutting that will likely occur during the summer months. Even if "removal" clearcutting does not occur during the summer months, the resulting take of Indiana bats is unavoidable. "Removal" clearcuts result in canopy closures of less than 10%. This habitat condition is considered "less than suitable" for the Indiana bat (Forest Service 2000). Therefore, when bats return from hibernation (low on fat reserves from the long hibernation season) and find their roosting habitat obliterated they will be forced to relocate to newer roosts. Some bats will quite possibly die before finding suitable roosts from a loss of fat reserves. Additionally, it is very possible that lacking ideal roosts, the bats will choose to use what is available in the area. This could result in the selection of roosts that are inadequate for their roosting needs. Bats could end up choosing roost sites that get too hot or lack appropriate humidity - conditions that may likely result in mortality.

The BO issued mitigation measures to limit the amount of mortality that Indiana bats can be expected to receive as a result of "removal" clearcutting. But the BO did not consider the temporary nature of shelterwood cuts and how they are actually likely to contribute to take of the bats. Nevertheless, there were strict requirements to retain potential roost trees following both shelterwood and removal cutting. These requirements are probably inadequate however due to post-cutting environmental conditions that often result in high levels of residual tree mortality and windthrow. The Draft EIS for Threatened and Endangered species on the Allegheny documents this problem as well. There is also a significant amount of mortality and damage that affects residual trees that results directly from the logging activity itself. There is also a concern that neither the Draft EIS nor BO considers how the size of cutting units might decrease the effectiveness of the mitigation measures proposed.

The analysis presented on pages C-34 and C-35-C-36 of the BA for East Side does not imply that there will be an improvement in Indiana bat habitat as a result of shelterwood harvest, as the commentor suggests. Since habitat conditions resulting from shelterwood treatments will be short-term in nature, the changes in habitat conditions evaluated in the BA and displayed in Appendix A, are based upon the conditions that will result following the final harvest treatment, or removal cut (BA, p. C-35). Additionally, all alternatives comply with the terms and conditions set forth in the BO (BA, p. C-42 & C-43). The commentor's assertion that the BO underestimates take is noted.

Comment #134

Salvage Shelterwood Cutting-

Another problem associated with shelterwood cutting is that "salvage" shelterwood cuts are becoming utilized more often than "green" shelterwood cuts. Indiana bats are known to use exclusively dead and dying trees in parts of their range (Kurta and Foster 1999). Salvage cutting targets dead and dying canopy trees first. The result is that prime habitat for the Indiana bat is not only being cut down and removed, but it is being prioritized for this type of activity. "Salvage" cutting, as a result, is likely to contribute to the killing of Indiana bats. This important aspect of the impacts of "salvage" logging is ignored by the BO and Draft EIS for Threatened and Endangered Species.

The effects of shelterwood cutting are discussed in the Vegetation section of Chapter 3, pp. 152 and 153. Additional discussion can be found in the Wildlife section of Chapter 3, pp. 207 and 208. The determination made for the Indiana bat in regards to activities proposed in the East Side project, is "alternatives 1, 3, and 4 no adverse effects beyond those set forth in the Biological Opinion (USDI-FWS 1999) alternatives 2 and 5 – may affect due to long term loss of optimal canopy conditions" (p. 228) Also, Standards and Guidelines included in the recent Forest Plan Amendment assure that adequate habitat is retained in all methods of harvest where salvage occurs.

Comment 129-135

Salvage Thinning and Sanitation Cutting-

Both salvage thinning and sanitation cutting methods result in canopy closures that are between 50 and 70 percent (if you accept the methods used by the Forest Service). Like shelterwood cutting, these cutting practices result in canopy closure conditions that are temporary. Their inclusion as "intermediate" treatments describe this. Therefore, both of these cutting methods create similar problems to the shelterwood cutting. For if it is indeed true that these cuts promote "optimal" habitat conditions for Indiana bats, they will then also result in greater mortality for the bats due to subsequent logging activity. Unlike the shelterwood cuts, however, salvage thinning and sanitation cutting is not usually followed as quickly with other cuts. It is true that areas that have been "salvage" thinned have been followed with subsequent cuts less than two years following the original cutting activity. On the other hand, these areas are likely to be cut again no more than twenty years following the "salvage" cuts.

Nevertheless, all kinds of "salvage" logging targets the trees that are most suitable for Indiana bat roosting -dead and dying trees. This practice of targeting suitable trees for roosting increases the likelihood of take - especially if this cutting occurs in previously uncut forest that the bats prefer. Ironically, if these types of forested areas are uncut they would produce a plethora of suitable roost trees and would result in lower canopy closure due to the tree mortality that is occurring. Presumably, the trees would die resulting in the loss of established crowns and canopy closure within the "optimal" range. So it is that the best alternative for areas where silviculturists may plan "salvage" cuts is Zero Cut.

The effects of salvage thinnings are discussed in the Vegetation section of Chapter 3, p. 154snd 155. Additional discussion can be found in the Wildlife section of Chapter 3, p. 206. Also, see pp. C-34 and C-42 of Appendix C. The determination made for the Indiana bat in regards to activities proposed in the East Side project, is "alternatives 1, 3, and 4 no adverse effects beyond those set forth in the Biological Opinion (USDI-FWS 1999) alternatives 2 and 5 – may affect due to long term loss of optimal canopy conditions" (p. 228).

Comment 129-136

Removal Cutting-

"Removal" cutting is a form of clearcutting where all or nearly all of the trees are moved from an area of forest. Removal cutting is potentially the most harmful to the Indiana and northern long-eared myotis species. Removal cutting results in canopy closures (less than 10%) that are far less than suitable for the Indiana bat. Removal cutting is also a significant method of cutting proposed for the East Side Project. Nevertheless, nowhere in the Draft EIS for the East Side Project nor in the Draft EIS for Threatened and Endangered Species will you actually find an analysis of the impacts due to removal cutting. Using the misleading guidance that shelterwood and other salvage cuts promote canopy closures between 50 and 70 percent that are allegedly preferred by the Indiana bat as smoke and mirrors, the Forest Service attempts to disguise the fact that their EAs and EISs mostly ignore the unique impacts of "removal" clearcutting. This is such an important aspect of the ongoing logging program (see Table 7) that the virtual exclusion of this analysis can be nothing other than intentional.

When the Forest Service does address it, they disguise it with the idea that "removal" cuts occur only within a small aspect of the landscape (less than I % each year). The fact remains, however, that the Forest Plan calls for cumulative "removal" cuts and other cuts on as many as 13,000 acres of forest each year - guaranteeing that virtually every acre of forest will have been logged at least once by 2050. Such a program will inevitably lead to large-scale mortality for the endangered Indiana bat. Additionally, most "removal" cuts occur where '4shelterwood" cuts have previously occurred. If it is true that Indiana bats find conditions created by shelterwood

Comment 129-136 cont.

cuts to be "optimal," then Indiana bats are likely occupying shelterwood sites. This suggests that, in fact, Indiana bats will likely receive disproportionate mortality due to the amount of acres actually logged.

"Removal" cuts will result in high levels of mortality for Indiana bats. Cutting during the summer will result in direct mortality while winter-time cutting will result in indirect mortality. In addition, removal cuts fragment the forest resulting in less suitable habitat for Indiana bats - who have been shown to prefer less fragmented and unlogged forests.

The effects of removal cutting are discussed in the Vegetation section of Chapter 3, p. 153. Additional discussion can be found in the Wildlife section of Chapter 3, pp. 207 and 208. Also, see pp. C-28 and C-35 of appendix C. A discussion of fragmentation can be found in the Wildlife section, pp. 221-223. The determination made for the Indiana bat in regards to activities proposed in the East Side project, is "alternatives 1, 3, and 4 no adverse effects beyond those set forth in the Biological Opinion (USDI-FWS 1999) alternatives 2 and 5 – may affect due to long term loss of optimal canopy conditions" (p. 228).

Comment 129-137

Uneven-aged Alternative-

Given the habitat preferences of the endangered Indiana bat, it is very clear that uneven-aged cutting is far more optimal than even-aged cutting. Uneven-aged never results in the removal of most of the trees from an area - helping to reduce mortality to bats. Uneven-aged cutting never results in canopy closures less than 50%. Uneven-aged cutting does not result in a forest condition that is temporary in nature. Uneven-aged cutting is rarely performed for "salvage" purposes. And if you accept the canopy closure premise uneven-aged cutting results in "optimal" habitat conditions that are more permanent in nature. Adopting an uneven-aged logging alternative will assist in the conservation and recovery of the endangered Indiana bat - and help the Forest Service move towards its 7(a) I obligations under the ESA.

Comment noted. See Comment 129-131 and 129-132. Alternative 4 is the uneven-aged alternative and does not result in more optimum habitat for Indiana bats than Alternative 1 over the long-term (Appendix C Tables 16 and 17 pp. C-35 & C-36).

Comment 129-138

No Salvage Across All Alternatives-

The range of alternatives should be changed to eliminate "salvage" cutting from all alternatives. This should be done to reduce the likelihood of mortality to the Indiana and northern long-eared bats. This should be done to ensure adequate roosts now and into the future. The side-effects of this action would be positive - greater bio-mass reserves that allow the forest to defend itself against stressors such as drought and insect defoliation. Areas of the Allegheny that are not logged retain greater amounts of both dead and living trees (Stout 1995). Eliminating salvage logging will assist in the conservation and recovery of the endangered Indiana bat - and help the Forest Service move towards its 7(a) I obligations under the ESA.

See the Purpose and Need section of Chapter 1. See the Wildlife section, p .206, and Appendix C pp. C-35 and 36.

Comment 129-139

Seasonal Restriction on Cutting Across All Alternatives-

Under no circumstances should logging occur between April I and October I on the Allegheny. Taking this action across all alternatives will help ensure that roosts of Indiana bats are not directly destroyed by cutting activity. Although cutting would still result in indirect mortality when the bats return from hibernation, a seasonal restriction would help reduce the impacts to bat populations and should be applied across all alternatives. Adopting a seasonal limitation on logging will assist in the conservation and recovery of the endangered Indiana bat - and help the Forest Service move towards its 7(a) I obligations under the ESA.

Comment noted. As described in the BA (Appendix C), bats that depend on naturally ephemeral roosts have developed survival mechanism to find alternate roost trees when a suitable roost tree becomes unsuitable. Additionally, tree removal does not discourage Indiana bats from using dead trees nearby as roosts. In fact, opening up the forest canopy and allowing more sunlight to hit the tree, making it warmer and thermally more stable and may make residual trees more attractive as roost trees. As a result, removal of trees while the bats are in hibernation is not expected to result in indirect mortality, nor will direct mortality exceed levels of incidental take identified in the BO.

Comment 129-140

The Northern Long-Eared Bat

-Given everything that we have said about the Indiana bat, we can now consider the northern long-eared bat. The northern long-eared bat has very similar preferences as the Indiana bat. This species roosts in trees during the summertime, prefers less fragmented tracts of uncut forest, and is known to use the Allegheny extensively during the summer months. Like the Indiana bat, the northern long-eared bat is declining and therefore has been listed as a Federal Sensitive Species on the Allegheny. There are a couple of major differences between the summer habitat needs of the northern long-eared bat and the Indiana bat. Specifically, the northern long-eared bat more often selects living trees for roosts and prefers forests with higher canopy closure (Kurta and Foster 1999). In fact, the northern long-eared bat prefers canopy closures greater than 80%. Therefore, the most optimal combination of habitats for the two myotis of concern on the Allegheny include un-logged older forest areas where canopy closures are always greater than 50% and include large tracts of forest where canopy closures are greater than 80%. Therefore the Forest Service should select the No Action alternative for the East Side Project. Eliminating logging within the East Side Project Area will assist in the conservation and recovery of the endangered Indiana bat - and help the Forest Service move towards its 7(a) I obligations under the ESA.

Several of the new PETS species are sensitive to sedimentation in watersheds caused by logging and the failure to prevent damage caused by logging roads through obliteration (and in rare cases restoration). The Draft EIS for the East Side Project should be rescinded and new revised EIS developed that considers alternatives that include ZERO logging, ZERO herbicide, ZERO road construction, obliteration of roads that are causing sedimentation problems in streams (or could cause such problems), planting of native trees such as eastern hemlock (Tsuga canadensis), sycamore (Platanus occidentalis), and maple (Acer spp.) along troubled stream banks, and the replanting of skid trails and clearcuts with native species such as hemlock and eastern white pine (Pinus strobus). No black cherry should be planted here or anywhere else in the Allegheny ever again.

Habitat use for the Northern Long-eared bat is expected to be similar to that of the Indiana bat. Direct and indirect effects to the Northern Long-eared bat, including effects from a "no logging" alternative (Alternative 5), were evaluated on p. C-36 of the BA (Appendix C). Like the Indiana bat, all sites proposed for treatment under all alternatives will continue to provide live and dead trees for roosting and desirable foraging habitat conditions for the northern long-eared bat.

Comment 129-141

1. The canned language the Forest Service uses in their timber sale documents supports the need for a Forest-wide EIS and Forest Plan Amendment before proceeding with the East Side Project. The NEPA requires that the Forest Service use "program, policy, or plan environmental impact statements ... to eliminate repetitive discussions of the same issues" 40 CFR 1500.4 0). The canned language, most of which comes directly from the non-NEPA document "Biological Assessment" (a violation of 40 CFR 1500.4 (k) for not combining the consultation required BA as a NEPA statement), has resulted in a completely unnecessary waste of paper by repeating discussions that could otherwise be addressed in a Forest-wide TES NEPA statement and Forest Plan Amendment. The East Side Project should not proceed in any fashion until a Forest-wide NEPA statement and Forest Plan amendment have been fully executed. See also 40 CFR § 1502.20 and 1502.21 and also 1909.15 FSH § 42. 1.

The Forest Plan was amended and FEIS signed on July 28, 2000.

Comment 129-142

2. Another problem created by the failure to first amend the Forest Plan and conduct a Forest-wide NEPA EIS is the fact that the Forest Service has not resolved many broader issues for NEPA and NFMA purposes regarding TES species on the Allegheny. For example, the issue of the relationship between relative density and canopy closure was questioned in Federal Court proceedings in January of 1999 by Dr. David Pistole. This issue and many others have not been resolved for NEPA purposes (other issues include the current status of Indiana bats in Pennsylvania and other nearby states, the comments provided by experts on the Indiana Bat Recovery Plan, recent studies coming out regarding lynx habitat use, the proposed addition of 18 new species to the Allegheny Sensitive Species List, etc.). It would be inappropriate to address these broad issues at the site specific level when the Forest-wide opportunity and need exists (once again to avoid repeating discussion that could otherwise be addressed in the broader impact statement). Therefore, the East Side Project should not proceed in any fashion until a Forest-wide NEPA statement and Forest Plan amendment have been fully executed.

The Forest Plan was amended and FEIS signed on July 28, 2000.

Comment 129-143

3. The NEPA further calls for action to reduce delay (40 CFR 1500.5 (f) and (g)). This is compromised by the Forest Service's failure to perform a Forest-wide EIS and Forest Plan amendment pursuant to the NFMA and the NEPA. Again, the East Side Project should not proceed in any fashion until a Forest-wide NEPA statement and Forest Plan amendment have been fully executed.

The Forest Plan was amended and FEIS signed on July 28, 2000.

Comment 129-144

4. These violations combined with the substantive violations of federal law that have gone into this analysis (or in most cases, the violations of federal law indicated by the lack of analyses) for the East Side Project clearly demonstrates why the East Side Project should be cancelled for the benefit of PETS species. The Forest Service, by not following the proper procedures (required by the NEPA and the NFMA) is putting PETS species at risk while wasting tax dollars and paper by doing a premature and illegal analysis on the East Side Project. The Forest Service would save taxpayers' monies, reduce paper consumption, and provide greater protections to PETS species if they would first proceed with the appropriate Forest-wide surveys for PETS species, then prepare a Forest-wide EIS on PETS species, then implement a Forest Plan amendment to incorporate new standards and guidelines to protect PETS species into the existing deficient Forest Plan, and then, and only then, preparing a new EIS to look into the effects of the East Side Project in combination with the other 44 timber sales currently being evaluated.

See Appendix C for a discussion of PETS species.

Comment 129-145

1. 36 CFR § 219.26 requires that the Forest Service maintain inventories that include "quantitative data making possible the evaluation of diversity in terms of its prior and present condition." The Forest Service has failed to conduct adequate inventories for plant and animal populations on the Allegheny. By implementing these site specific projects without this data, the Forest Service has violated the NFMA. The East Side Project cannot legally be implemented without first compiling this data to ensure compliance with the NFMA.

The need for project level field reconnaissance is commensurate with the risks associated with the project, the species involved, the likelihood of species occurrence and the level of knowledge already at hand. Through its Forest-wide wildlife monitoring efforts (wetland plant surveys, breeding bird transects, etc.), as well as project level surveys (Forest Plan 5-1 and 5-5), the ANF has been collecting data on a wide variety of wildlife, including threatened, endangered and sensitive plant and animal species. As a result, sufficient survey data has been conducted to adequately assess wildlife diversity within the East Side project area.

Comment 129-146

1. Since approving the existing Forest Plan on the Allegheny, the Forest Service has implemented logging activities on 90,669 acres of the Allegheny (>17% of the ANF's land base). During the same period of time ZERO management plans for PETS species (as required by the 1986 Forest Plan on page 4-37) have been prepared. Of those logging projects implemented, 84,463 acres (or 93.2%) have been done using the system called "even-aged management." The NFMA specifically requires that even-aged cutting be discouraged. The NFMA further requires that viable populations of PETS species be maintained. PETS species on the Allegheny typically require contiguous tracts of older forests and/or high water quality. Of all cutting methods available to the Forest Service, even-aged management results in the least contiguous mature f6rests and the greatest impacts to water quality (through erosion and sedimentation). Despite the fact that the presence of a number of PETS species have been confirmed (virtually every survey that has been done has confirmed the presence of PETS species) since the 1986 Forest Plan was approved, efforts to update the Forest Plan have been repeatedly delayed. The East Side Project calls for more even-aged cutting, and does so without considering other alternative cutting methods. The East Side Project, as proposed, will result in the greatest harm to PETS species by utilizing the cutting methods that cause the greatest harm. Therefore the Forest Service must select No-Action alternative. The continued implementation of even-aged management without careful consideration of alternative methods/projects is a violation of the NFNIA's requirements to maintain viable populations of PETS species.

The NFMA does not "specifically require the even-aged cutting be discouraged". Please see "Forest and Rangeland Renewable Resources Planning Act of 1974" (16 U.S.C. 1600 (Sec. 6) (g) (3) (F) (i)).

Comment 129-146 cont.

Page 4-37 of the Forest Plan states that the Forest 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. Before a management plan can be developed, adequate data must be collected to assess habitat conditions. Through its Forest-wide wildlife monitoring efforts (wetland plant surveys, breeding bird transects, etc.), the ANF has been collecting necessary information from which management plans can be developed. Additionally, the ANF is coordinating with other forests across the Region to develop conservation assessments and strategies for all of the Regional Forester's Sensitive Species. The first conservation assessment has been initiated (Yellow-bellied flycatcher) and will be completed in 2001. The five T&E species covered in the Biological Opinion are addressed in a Conservation Program (FEIS for Threatened and Endangered Species on the Allegheny National Forest, Appendix A).

Effects to PETS species and their habitat were evaluated in the BA (Appendix C, p. C-26-C-36) and based on the analysis provided, there is no indication that selection of the preferred alternative (Alternative 1) will result in the loss of viability of any species, as suggested.

Comment 129-147

1. As the Forest Service knows from our previous letters, the ADP position is that no projects should proceed towards implementation until the Forest Plan has been amended to incorporate new information on PETS species and new Forest-wide standards and guidelines are put in place on which to base the revised project environmental analysis (following, of course, required and appropriate opportunities for public participation and administrative review with regard to the EIS and Forest Plan amendment). Until the time that a final EIS for the Forest Plan has been approved and those Standards and Guidelines adopted in the amended Forest Plan have been fully incorporated, as appropriate in individual project decisions, any attempt by the Forest Service to move forward with these projects represents arbitrary and capricious action and constitutes a violation of federal law. The East Side Project should not proceed in any fashion until a Forest-wide NEPA statement and Forest Plan amendment have been fully executed.

The Forest Plan was amended by the FEIS signed on July 28, 2000. See Comment 129-146. Also, see Comment 129-158.

Comment 129-148

2. In response to our previous questions as to whether or not non-logging projects were actively being implemented, the Forest Service gave us either no response or implied that this was not the case. However, as previously mentioned, two ADP members were unfortunate enough to encounter a recently herbicided tract on the Marienville District during the summer of 1999. Both ADP members suffered dearly for the Forest Service's illegal actions by experiencing nausea, stomach queasiness, and irritation of the eyes and throat for hours after their encounter. This illegal action has already caused harm to our members. Some ADP members who use the Allegheny are on the state list for being sensitive to the application of pesticides. All implementation must stop until a decision is issued and all citizen comment and appeal rights are exhausted.

As stated in the response to Comments 129-61 and 129-62, no activities from the East Side project have or will be implemented until the NEPA process has been completed.

Comment 129-149

1. As a matter of law the Forest Service is required to consider an un-even aged alternative (see Curry v. U.S. Forest Service). The NFMA requires that even-aged management be used only where it is considered to be suitable or optimal. It cannot be shown that even-aged cutting is optimal for a site unless it can be shown in comparison to un-even aged cutting (and no cutting) that it is optimal. The new information that is relevant to the East Side Draft EIS involves impacts to PETS species. Those species are impacted differently depending on the selection of cutting method used. For example, the Indiana bat is affected differently by an even-aged removal cut than it is by an un-even aged single tree selection cut. If 10 acres of forest is in suitable or optimal habitat conditions, it can either be affected by a selection cut (where it remains in suitable, albeit perhaps less suitable, habitat) or a removal cut (where it is removed from suitable habitat for the next 60+ years that is if it is NOT one of the 8% of removal cuts that fails to regenerate altogether). For the mountain brook lamprey (Ichthyomyzon greeleyi) and a number of other PETS species, the amount of sedimentation released by a removal cut versus a selection cut varies greatly, resulting in largely varied impacts on the aquatic life - including many of the PETS

Comment 129-149 cont.

species that are sensitive to sedimentation. For these and other reasons, the Draft EIS for the East Side Project should be withdrawn and a new revised Draft EIS should be drafted that includes an un-even aged only alternative. Alternative 4 for the current East Side Draft EIS does not go far enough

See response to Comments 129-5, 129-34, 129-132, and 129-137 for discussions regarding uneven-aged management.

Comment 129-150

1. Many PETS species require mature forests as habitat. The Pennsylvania Fish and Boat Commission says that "Every citizen has a role in protecting critical habitats of Pennsylvania's endangered and threatened species. Stronger community efforts are needed to protect wetlands, mature forests, and other critical areas" (see http://www.state.pa.us/Fish/etspecis.htm). The East Side Project, if approved, would compromise the integrity of Pennsylvania's Threatened and Endangered species by destroying wetlands, mature forests, and these species critical habitats.

See the BA (Appendix C) for discussions regarding the effects of proposed activities on PETS species.

Comment 129-151

2. The contents of this section of comments brings to light some important points: that the Allegheny is home to or potentially home to a number of species which are facing critical points in their survival, that the Allegheny as public lands provides the greatest hope for the conservation and recovery of many critically endangered species, and that the proposed East Side Project is terribly inconsistent with the needs of these species. Furthermore, we see that the Forest Service has far from met their obligations under the NEPA, the NFMA, and the ESA to protect these species. The Forest Service has failed to identify the habitats and habitat needs of PETS species. The Forest Service has failed to conduct adequate surveys for PETS species. The Forest Service has failed to develop inventories documenting the PETS species' use of the Allegheny. The Forest Service has failed to develop a Management Plan for PETS species. The Forest Service has failed to prepare a Forest-wide EIS documenting the needs of Allegheny PETS species. The Forest Service has failed to amend the Forest Plan by incorporating protection and recovery measures for the successful management of PETS species. The Forest Service has failed to meet their obligation to survey the East Side Project Area for PETS species. The Forest Service has then drawn arbitrary conclusions on the impacts of the East Side Project on these PETS species. Despite all of these major flaws the Forest Service clearly intends to proceed with the East Side Project. These actions are unquestionably unacceptable. The American public has overwhelmingly expressed their support for the protection of PETS species. Members of the ADP and public at large are being robbed of their right to enjoy the East Side Project Area and view the plants and wildlife that are there. Members of the ADP and the general public have a right to do so without being poisoned by toxic herbicides. The legacy of lawless clearcut logging continues on the Allegheny - with absolutely no consideration given to the demands of the taxpaying citizens of the United States of America to protect our forest, our water, our bio-diversity, our trees and our wildlife. The Forest Service must make amends by choosing the No Action alternative and protecting the interests of Americans who have fought long and hard for their country - their wild country!

Commentor's preference for the No Action Alternative is noted. Effects to species most at risk, or Federally threatened and endangered species and Regionally Sensitive Species (PETS), were evaluated on pages C-30 to C-39 of the BA. This analysis included a discussion or assessment of habitat conditions, limiting factors, trends, and monitoring and survey work completed at both the Forest and project level. The BA also includes an assessment of anticipated direct, indirect and cumulative effects on PETS species and their habitat Based on the analysis provided, habitat for all PETS species is being maintained and there are no effects to any sensitive species that would cause a trend toward federal listing, nor are there any adverse effects to any T & E species that were not considered in the BO (Except for potential impacts to Indiana bat habitat under the no action alternative) (BA, p. C-42 & C-43). Additionally, the FEIS for Threatened and Endangered Species on the ANF, which was approved on July 28, 2000 revises three existing Standards and Guidelines and adds 12 new guidelines. These changes in Forest Plan Standards and Guidelines were considered in the analysis of effects presented in the BA (Appendix C, p. C-1). Based on the analysis provided, obligations under NEPA, NFMA and ESA are being met.

Comment 129-152

1. The BO issued by the USF&WS on June 1, 1999, sets a number of terms and conditions that the Forest Service is expected to follow. The East Side Project must adhere to these conditions in their entirety.

All alternatives comply with the terms and conditions of the BO (BA, p. C-34) and there are no effects anticipated that were not considered in the BO (Appendix C, pp. C-30 to C-39).

Comment 129-153

1. In order to ensure compliance with the Forest Plan for the Allegheny when implementing site-specific actions, the Forest Service must first amend the Forest Plan to incorporate the new findings in the BO before proceeding with environmental analysis on the projects to be implemented under that plan (U.S.C. 1604 (i)).

The Forest Plan was amended and the FEIS signed on July 28, 2000.

Comment 129-154

2. The BO's Reasonable and Prudent Measures found that "Proposed management activities shall be planned, evaluated, and implemented consistent with measures developed to protect the Indiana bat including those recognized to maintain, improve, or enhance its habitat. These non-discretionary measures include, but are not limited to, current standards and guidelines found in the Forest Plan and amendments, and terms and conditions outlined in this opinion" (p. 69, emphasis added). it should be noted that those measures that may be desirable to further protect and enhance survival for the federally endangered Indiana bat can not be fully identified until an EIS is prepared, opened to public comment, approved, and the Forest Plan is amended to incorporate those measures necessary to give priority to all PETS species.

The Forest Plan was amended and the FEIS signed on July 28, 2000. Also, see Comment 129-146.

Comment 129-155

3. The BO's Reasonable and Prudent Measures further elaborate that "The Forest Service shall monitor timber sales and other activities on the ANF to determine if Forest Plan standards and guidelines, and the terms and conditions of this opinion are being implemented" (p. 69). The ability of the proposed site-specific actions and their analysis to comply with the Forest Plan standards and guidelines as it may be amended (and therefore the June 1, 1999, BO issued by USF&WS) requires that the Forest Service first amend the Forest Plan to address the new information that is available on PETS species before the appropriate site-specific environmental analyses may continue.

The Forest Plan was amended and the FEIS signed on July 28, 2000. Also, see Comment 129-146.

Comment 129-156

1. In addition to PETS species inventory requirements, the Forest Plan places a number of other legally binding requirements on the Forest Service. In particular, the Forest Plan Standards and Guidelines require that "The Forest ... develop management plans for all federal and state threatened and endangered species" (page 4-37). The analyses for the East Side Project makes no reference to any such management plans because the Forest Service has failed to develop them. Furthermore, many of the requirements stipulated by the Forest Plan would be impossible to implement without the development of TES management plans such as the requirements to "Acquire lands or rights needed to protect or reestablish threatened or endangered species of animals or plants" and "Protect specific key habitats and specialized habitats through coordination with other resource management activities or area closure."

The FEIS for Threatened and Endangered Species on the ANF, which was approved on July 28, 2000, revises three existing Standards and Guidelines and adds 12 new guidelines. These changes in Forest Plan Standards and Guidelines were considered in the East Side BA (Appendix C, p. C-1). The need for project level field reconnaissance is commensurate with the risks associated with the project, the species involved, the likelihood of species occurrence and the level of knowledge already at hand. Survey work for PETS species conducted within the project area, as well as in suitable habitat across the Forest is described in the BA in Appendix C.

Comment 129-156 cont.

Section 7(a)(1) and 7(a)(2) of the ESA require that National Forests develop programs for the conservation of T&E species, and that consultation between agencies take place to ensure that activities do not result in jeopardy to T&E species of concern. ESA does not require that this process be incorporated into a Forest Plan. The Conservation Program prepared by the ANF is a stand-alone document that responds directly to Section 7(a)(1) and 7(a)(2). There are no requirements in either NEPA or NFMA to include the Conservation Program in the Forest Plan. However, certain elements of the Conservation Program and BO should be incorporated in the Forest Plan.

State-listed threatened and endangered species known to occur on the ANF have been incorporated into the sensitive species list. Potential impacts to these species are addressed in the BA (Appendix C pp. C-30 to C-39).

Also, see Comment 129-146.

Comment 129-157

2. Any decision by the Forest Service to proceed with logging projects without first amending the Forest Plan for the Allegheny, then developing management plans for "all federal and state threatened and endangered species," then performing the legally mandated surveying and inventorying required for each species, and finally performing the adequate site specific analysis to best meet the needs of all of these species would be without question arbitrary and capricious and a violation of the ESA, the NFMA and the NEPA.

The Forest Plan was amended and the FEIS signed on July 28, 2000. Also, see Comment 129-146.

Comment 129-158

On February 29, 2000, the Regional Office for the Eastern Region approved a new list of sensitive species for the Allegheny. The Forest Service, however, has continued to ignore new information on sensitive species that calls for a large-scale Forest Plan amendment. The Forest Service has arbitrarily narrowed the focus of the Forest Plan amendment for Threatened and Endangered species specifically to exclude sensitive species. Before the Forest Service can proceed they must develop a Forest Plan amendment for sensitive species.

The Forest Plan was amended for threatened and endangered species by the FEIS signed on July 28, 2000. See Alternative 8, p. 45 if that document. However, species identified by the Regional Forester were fully analyzed in the Draft and Final East Side EIS. Based on the analysis provided, there are no effects to any sensitive species that would cause a trend toward federal listing (FEIS, Appendix C, pp. C-42 & C-43).

Comment 129-159

1. The East Side analysis fails to incorporate monitoring information as mandated by the BO: "Within the portion of the ANF that drains into the Allegheny River, the Forest Service will monitor timber sales, oil and gas activity, and other activities that could possibly degrade water quality to determine if these measures are being implemented and if water quality degradation occurs" (p. 70).

The area referred to for monitoring per the BO is outside the Eastside Project Area. The BO states that monitoring will be conducted on several tributaries draining directly into the Allegheny River between Kinzua Dam and Tionesta Creek.

Comment 129-160

2. Furthermore, the BO and the Forest Plan require more intensive surveying for TES species than has been done to date in regard to the East Side Project. The BO explicitly states on page 74 that "surveys [for the Indiana Bat] shall be conducted in proposed timber harvest areas, especially those areas where canopy closure will be reduced to <54 percent (e.g., final harvests such as clearcuts and shelterwood removal cuts)." In fact, the BO cites the requirement in the existing Forest Plan that the Forest Service "Assess the occurrence of animal and plant species in all areas to be affected by land adjustment or resource management activities, and design action to avoid, minimize, or mitigate potential adverse effects" (p. 4-37, emphasis added). This Forest Plan Standard and Guideline is legally binding and is considered within the Forest Plan to be one of many "requirements." To date, surveys within the East Side Project Area have been conducted for ONLY a handful of species. And some of these surveys were performed years ago under out of date protocol - e.g. small whorled pogonia.

Comment 129-160 cont.

The need for project level field reconnaissance is commensurate with the risks associated with the project, the species involved, the likelihood of species occurrence and the level of knowledge already at hand. Additional Indiana bat surveys in areas proposed for timber harvest were implemented in the East Side project area after discussions with USFWS. Information presented in the FEIS is based upon this survey work. Also, see response to Comment 129-145.

Comment 129-161

3. Surveying before an action is taken is an essential means of determining whether or not an action will affect the species (and whether or not specific mitigation measure may need to be incorporated into the decision). Several legal precedents have upheld this requirement including Oregon Natural Resource Council v. United States Forest Service, the recent decision issued by federal Judge William L. Dwyer. In this case, the language in the Northwest Forest Plan is nearly identical to the contents of page 4-37 of the Forest Plan. This guideline clearly requires that the Forest Service know if a species uses an area of forest before an action is implemented, something that cannot be done without surveying the area - the Forest Plan specifically states that the occurrence of all TES plant and animal species is to be known in all areas "to be affected" which is a direct reference to the requirement to survey. Furthermore, the 11th Circuit decision in Sierra Club v. Martin, 168 F. 3d 1, 5, also clearly requires surveying for these PETS species. The Forest Service has not met this legal obligation in attempting to implement the East Side Project.

Surveys for the Indiana bat and other TES species likely to occur in the project treatment areas have been completed (Appendix C pp. C-2 to C-16).

Comment 129-162

1. In June of 1994, the Preserve Appalachian Wilderness (hereinafter, "PAW") submitted a sensitive species plan for the Allegheny to the Forest Service (Rooney 1994). PAW's intent was to assist the Forest Service in implementing a sensitive species plan for the Allegheny - which to date lacks such a plan. In the interest of preserving biological diversity on the Allegheny, the Forest Service must institute a plan for ensuring that viable populations of PETS species are maintained and enhanced.

While the PAW management plan was a good summery of existing literature in 1994, many of the suggested recommendations were based upon general habitat conditions without the benefit of local survey data. Before a management plan can be developed, adequate data must be collected to accurately assess habitat conditions. Through its Forest-wide wildlife monitoring efforts (wetland plant surveys, breeding bird transects, etc.), the ANF has been collecting necessary information from which management plans can be developed. Additionally, the ANF is coordinating with other forests across the Region to develop conservations assessments and strategies for the Regional Forester's Sensitive Species. The first conservation assessment has been initiated (Yellow-bellied flycatcher) and will be completed in 2001. The Biological Assessment in Appendix C, utilizes the most current information available, including on-Forest and site specific survey data to assess habitat conditions for PETS species. Also, see response to comments 129-146 and 129-151.

Comment 129-163

2. The Forest Service needs to conduct in-depth population studies for PETS species if it hopes to successfully maintain viable populations and help lead the species towards recovery. Rooney (1994) explains that while population analysis can be complicated, in-depth studies can give a good picture of a species' habitat.

See Comment 129-162. A determination of potential impacts has been made for each species (Appendix C pp. C-42 & C-43).

Comment 129-164

3. The Allegheny provides an important role in the conservation and recovery of populations of PETS species. Private lands can not be expected to prove a significant role in the recovery of PETS species. In Pennsylvania there is very little control over habitat alteration on private lands, meaning that public lands such as the Allegheny face a unique burden in sustaining populations of PETS species (Rooney 1994).

Providing habitat for PETS species is recognized as an important role on National Forest System Lands. The BA (FEIS Appendix C) fully analyzes potential effects on PETS species and their habitat and based on the analysis provided in the BA (Appendix C pp. C-30 to C-39), there are no effects to any sensitive species anticipated that would cause a trend toward federal listing, nor are there any adverse effects to any threatened or endangered species or their habitat, that were not considered in the BO (Appendix C pp. C-42 & C-43).

Comment 129-165

1. We are particularly concerned about whether or not the Forest Service will follow through with commitments to protect and recover PETS species. The Forest Service has shown over and over that implementing timber sales is their highest priority on the Allegheny while Forest-wide efforts to protect and recover PETS species are one of their lowest priorities. Most of the Forest Service' efforts towards PETS species are merely mitigation measures implemented as part of their process of pushing through timber sales. This concerns us because it is a process of lessening negative impacts when we need to take more positive recovery measures for these species. This becomes particularly disconcerting when the USDA Inspector General (1999) has found that the Forest Service is lax when it comes to properly implementing mitigation measures:

> Forest Service's administrative controls over the preparation of environmental documents and implementation of mitigation measures applicable to Timber sales have not been effective. (USDA Inspector General 1999: 1)

The Inspector General did not review any projects on the Allegheny National Forest.

Additionally, all activities comply with the terms and conditions set forth in the BO (Appendix C) and required mitigation measures identified in Appendix D of the FEIS will be implemented. As a result, all proposed activities provide for the protection/enhancement of habitat and are consistent with the recovery of the Indiana Bat.

Comment 129-166

2. The Inspector General characterized circumstances like this very well when it said that "Future generations and the natural environment also suffer when Forest Service employees overlook sensitive resource issues and do not adequately protect heritage resources, water quality, and threatened, endangered, or sensitive species and their habitat" (USDA Inspector General 1999). The Forest Service has completely ignored impacts to many PETS species within the East Side Draft EIS.

Impacts to PETS species and their habitat are fully evaluated in the BA (Appendix C pp. C-30 to C-39). Also, see response to Comment 129-166.

Comment 129-167

3. The fact that the Forest Service would conclude no impact where there is an impact is no surprise according to the Inspector General:

> The Forest Service cannot rely on their environmental documents (i.e., environmental assessments, biological evaluations, decision notices and "Findings of No Significant Impact") to provide assurance of compliance with environmental laws and regulations. This condition exists because the administrative controls over the preparation of environmental documents were not effective (see Conclusion No. 1). As a result, (a) Forest Service's conclusions that actions (e.g., Timber sales) would not have a significant effect on resources, threatened, endangered, and sensitive species, and the human environment were questionable, (b) all relevant data was not collected and presented to the public, and (c) the environment could be adversely effected (USDA Inspector General 1999).

See response to Comment 129-166.

Comment #168

4. The surveying for PETS species is not a requirement that can be ignored by the Forest Service as has been done for the East Side Project. The Inspector General notes (below) that surveys for PETS species are a fundamental part of the BEs. The Forest Service, however, did not conduct the necessary surveys in the East Side Project Area as required. Therefore the Draft EIS for the East Side Project has the same deficiencies as described here by the Inspector General:

> Eight of the [12] biological evaluations [reviewed] did not address all threatened, endangered, and sensitive species either known or expected to exist in the project areas. In addition, surveys to locate or confirm the absence of threatened, endangered, and sensitive species were either not conducted or not documented for six of the biological evaluations. (USDA Inspector General 1999: 14)

The need for field reconnaissance is commensurate with the risks associated with the project, the species involved, the likelihood of species occurrence and the level of knowledge already at hand. Survey work for PETS species conducted within the project area, as well as in suitable habitat across the Forest is described on pp. C-2 to C-16 of the BA in Appendix C. As described, the project area has been surveyed for the Indiana bat, Northern Long-eared bat, Eastern small-footed myotis, Long-solid mussel, harpoon clubtail, midland clubtail, ski-tailed emerald, Maine snaketail, zebra

Comment 129-168 cont.

clubtail, rapids clubtail, mustached clubtail, Uhlers sundragon and small-whorled pogonia. Additionally, based on the analysis provided in the BA (FEIS Appendix C), adequate surveys have been completed to evaluate present condition habitat and assess effects to PETS species and their habitat.

Comment 129-169

5. The Inspector General (1999) specifically recommends (Recommendation No. 4b) that "surveys [for threatened, endangered, and sensitive species] be conducted or other relevant information gathered, as needed, when ... there is suitable habitat for such species in the project area." The Forest Service has not followed this direction in preparing the Draft EIS for the East Side Project - direction that the Department of Agriculture's Inspector General specifically suggests.

See Comment 129-168.

Comment 129-170

1. The segmentation of the Biological Assessment (hereinafter, "BA") into two separate parts does not make any sense. The Forest Service fails to provide a good cumulative effects analysis due to this segmentation.

2. Page C-1 of the BA states that:

> The analysis presented in the Biological Assessment for Threatened and Endangered Species on the Allegheny National Forest (December 1998) is not repeated in this biological assessment; however, it is incorporated by reference along with Fish and Wildlife Service's Biological Opinion (June 1999).

The NEPA requires that items incorporated by reference, "be cited in the statement and its content briefly described." The Forest Service fails to do this in the BA/EIS. Neither the forest wide BA nor the BO are described within the EIS. This violates the NEPA implementing regulations.

The purpose of the statement on page C-1 of the BA is to let the reader know that information contained in the Biological Assessment for Threatened and Endangered Species on the Allegheny National Forest and the Fish and Wildlife Service's Biological Opinion will be used in the remainder of the analysis. There would be no point in trying to summarize the contents of both documents. For example, see page C-8. Specific pages are referenced in the documents which refer the reader back to the "incorporated" documents when necessary. As stated on page C-1, the reason for this approach is reduce excessive paperwork as per 36 CFR 1500.4(j).

Comment 129-170

3. The Forest Service is required to analyze the impacts of the proposed action on state listed species. The Forest Plan requires that the Forest Service develop Management Plans for state and federally listed threatened and endangered species. The Forest Service has not completed this process for any species. Plans have been initiated for the federal species (due to other requirements under the ESA) and one state endangered species (the Yellow-bellied flycatcher.) But neither of these plans have been completed. This is, of course, important since many of these species either inhabit the East Side Project Area or live downstream. The continued implementation of the Forest Plan without first developing these Management Plans constitutes a very serious violation of the NFMA. To make matters worse, the East Side Draft EIS does not even give many state threatened and endangered species special consideration. The EIS is therefore inadequate for its failure to give this important issue consideration.

State-listed species known to occur on the ANF were considered for listing on the Regional Forester's Sensitive Species List that was updated on February 29, 2000. Since this update, efforts have begun to develop conservation assessments and strategies for sensitive species on the ANF. Impacts to all sensitive species are addressed in the BA (Appendix C). Also, see Comments 129-146, 129-151, 129-156, and 129-162.

Comment 129-172

4. On page C-2 you state:

For the Bald eagle, Indiana bat, Clubshell mussel, Northern riffleshell mussel, and Small whorled pogonia a detailed habitat description can be found in the Biological Assessment for Threatened and Endangered Species on the Allegheny National Forest (December 1998).

You need to be aware that if there is information contained the Biological Assessment for Threatened and Endangered Species on the Allegheny National Forest that you wish to base your analysis upon, then it must be summarized within the East Side BA. You can not rely upon material contained within the BA that is not summarized in the EIS (40 CFR § 1502.21).

On page C-1 it states that "the Biological Assessment for Threatened and Endangered Species on the Allegheny National Forest (December 1998) is not repeated in this biological assessment: however: it is incorporated by reference…". (40CFR1502.21). The brief summaries are on pages C-2, C-4, C-12, C-12, and C-14, respectively, for these species.

Comment 129-173

1. We hereby incorporate by reference into these comments all of our comments on the Draft Environmental Impact Statement for the proposed Forest Plan Amendment for Threatened and Endangered Species on the Allegheny National Forest. Many of the conclusions drawn within the East Side EIS rely upon many of the conclusions drawn in the above EIS. We demand that the Forest Service re-issue a new Draft EIS on the Forest Plan Amendment before revising the East Side Draft EIS. Once a Final EIS for the Forest Plan amendment is approved, a new revised Draft EIS for the East Side Project must be released for another public comment period.

The FEIS for Threatened and Endangered Species on the Allegheny National Forest was issued on July 28, 2000. There were no changes between the DEIS and FEIS for Threatened and Endangered Species on the Allegheny National Forest that are significant enough to cause another DEIS for the East Side project to be issued

Comment 129-174

1. American Brook Lamprey (Lampetra appendix)-

1. The American brook lamprey is a state candidate species that needs to be considered in the East Side Draft EIS. Please note that all 3 prior state candidate species are now extirpated due to failure to protect their habitats.

2. The North American distribution of the American brook lamprey indicates that the Allegheny lies within the heart of this species' range (http://www.utexas.edu/depts/tnhc/.www/fish/maps/huggmaps/lampappe.gif)

The commentor identifies 17 non-federally listed species not included on the ANF PETS species list, which he feels need to be considered due to state rankings, or vulnerability to potential impacts.

Risk assessments which looked at species vulnerability and were based on Forest and Regional occurrence, population status and trends, availability and distribution of suitable habitat and susceptibility to impacts, were conducted at the Regional level for these species, as well as other State listed species. These assessments incorporate the most current information available and based on the risk assessments completed, the 17 species identified by the commentor were either not included or were dropped from the Forests PETS species list. Uncommon species considered most vulnerable to management activities, as well as those species most likely to be affected due to the availability of suitable habitat and/or documented occurrence, were included on the ANF PETS species list. Effects to these species are addressed in the BA (Appendix C, pp. C-30 to C-39).

Although not included in the BA, anticipated effects to other wildlife species, including the 17 species listed by the commenter, as well as other State and Forest Species of special concern, are fully evaluated in the FEIS, Appendix C. The Mountain Brook Lamprey not the American Brook Lamprey occurs on the ANF.

Comment 129-175

B.American Burying Beetle (Nicrophorus americanus)-

1. The Forest Service has conducted NO surveys within the East Side Project Area for the American burying beetle (Surveys are required by the ESA, the NFMA, and the Forest Plan on page 4-37). The Forest Service arbitrarily and capriciously concludes within the Draft EIS for the East Side Project that no effects will occur to the American burying beetle based on the assumption that the American burying beetle has never been documented on the ANF. In fact, the Forest Service has NEVER looked for the species. It is impossible to document the presence of a species if you do not conduct surveys. The failure to conduct surveys sets a pre-drawn conclusion about the presence of that species. When the presence of a species is used as a basis for determining whether or not an action will impact that species, then the surveys and inventories for that species are clearly essential to making such a determination. Without these surveys and inventories the Forest Service is merely blowing wind by making conclusory statements. This is a violation of the NEPA, the NFMA, and the ESA. The Forest Service must conduct Forest-wide surveys for this, and other, species. The Forest Service must consider the Forest-wide impacts of continued implementation of the Forest Plan on this species in a Forest-wide EIS. The Forest Service must then amend the Forest Plan to include provisions to provide for the adequate protection and recovery of the American burying beetle.

2. According to Rooney (1994), the American burying beetle requires "mesic old growth forests with a deep litter, humus, and soil layer and a lack of dense understory" (Rooney 1994). The American burying beetle is threatened by habitat loss (the destruction of old growth forests) and the already lacking viability of this species' populations due to isolation (Rooney 1994). The Forest Service must consider the impacts of the East Side Project to this species' habitat as it will destroy maturing forests which provide suitable habitat for the American burying beetle.

3. The Forest Service should select the No Action alternative or develop a new zero-logging alternative to protect the American burying beetle and its habitat.

The commentor identifies 3 federally listed species including the American burying beetle, eastern cougar and Canada lynx, which he feels needs to be considered. Risk assessments which looked at species vulnerability based on Forest and Regional occurrence, population status and trends and susceptibility to impacts, were conducted for these species. Due to the lack of recent historical occurrence in PA, lack of historical occurrence on the ANF and in consultation with the USFWS (BA for Threatened and Endangered Species on the ANF, Appendix C), these species were dropped from the Forests PETS species list and as a result, were not evaluated in the FEIS.

Comment 129-175

2. American Ginseng (Panax quinquefolius)-

1. The East Side Draft EIS fails to adequately assess the impacts to the American ginseng, a state threatened species recently proposed for the Allegheny's Sensitive Species List. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment.

American ginseng was not added to the sensitive species list for the ANF during the recent update of the list.

Comment 129-177

3. Bald Eagle (Haliaeetus leucocephalus)-

1. The East Side Project must comply with the Terms and Conditions of the BO by protecting the habitat for the endangered bald eagle.

2. The Forest Service needs to amend the Forest Plan to increase the goal for the number of nesting eagles. Currently there are two nesting eagle nests on the Allegheny National Forest and one adjacent. The goal as documented in the Forest Plan, however, only calls for one nesting eagle by 2020. Failure to modify this goal constitutes a violation of the NEPA and the NFMA. The East Side EIS should not go forward until the Forest Plan is amended and the East Side EIS includes an analysis looking at the newly established goals for this species.

3. The Forest Service proposes in their Amendment to the Forest Plan to change the monitoring requirement for Bald eagles to get rid of the requirement that they consider population trends. This is proposed, however, without merit. This violates the NFMA, the NEPA, and the ESA. The East Side EIS can not legally go forward if this problem is not remedied.

4. The Forest Service needs to develop a plan for determining the cause of nest failures. Conditions need to be monitored to determine relationship between nest success and nest failure.

5. It is important to note that the eagles appear to prefer large white pines for nesting. Unfortunately, this species is given little consideration in Forest Planning.

6. The Forest Service needs to adopt mitigations for foraging habitat of eagles. We agree that protection of nests is important and that searching for new nests and roosting areas are important. Special emphasis should be placed on the search for winter roosting areas.

7. The impacts analysis on page C-26 states:

Comment 129-177 cont.

None of the alternatives propose cutting trees on the shoreline of these larger streams so existing perch sites would remain available for use.

There are other potential impacts to foraging habitat that need to be considered. The East Side EIS needs to look at potential disturbances within 660 feet of perching sites. This includes any road construction, motorized trail construction, logging, herbicide use, or other noisy disturbances. These activities should be prohibited within 660 feet of perch sites along the larger streams in the Project Area, especially but not limited to Tionesta Creek and Salmon Creek.

8. The mitigations outlined along page C-27 must be contained within all timber contracts.

9. The determination that there will be "No adverse effects beyond those set forth in the Biological Opinion (USDI-FWS 1999)" is incomplete. This is a NEPA analysis. The Forest Service may incorporate the BO by reference, but they must summarize the contents of that BO within the EIS. They can not simply rely upon blanket references to the BO. The BO is a massive document and can not be substituted for the required NEPA analysis. The fact that the BO considered some of these effects is irrelevant. The Forest Service is required to conduct a NEPA analysis. Within that analysis you are required to make an effects determination and document what those effects are going to be. You may incorporate other documents by reference but the contents to which you are citing must be summarized

1. **The East Side Project complies with the Terms and Conditions in the BO.**
2. **The current Forest Plan direction and desired future conditions (particularly MA 6.1, 6.2, and 5) along with standards and guidelines for bald eagles will provide suitable nesting habitat for a large population of bald eagles. However, since bald eagle populations are affected by many activities beyond those on the ANF, we prefer not to speculate on the number of nesting pairs that may inhabit the ANF by 2020.**
3. **We do not plan to continue with population type standards and guidelines but focus on habitat and protection of individuals. Monitoring will track bald eagle populations and the use of the habitat over time.**
4. **Monitoring will determine nesting success and also determine boating activity on the Allegheny Reservoir. Land management activities close to active nests will also be monitored. These monitoring efforts will provide insights into potential causes of nest failures but no formal research project has been developed.**
5. **The Conservation Program has adopted the following guideline:**
   "Three or more super-canopy trees should be identified and maintained within one-quarter mile of each nest as roosting or perching sites. These trees may be large white pines, dead deciduous trees, or trees with a dead or broken top." (Conservation Program p.A-3).
6. **Current Forest Plan direction provides foraging habitat for bald eagles by providing filter strips along streams. Furthermore, many land management activities are limited along the shores of the Allegheny Reservoir where a lot of foraging occurs. Winter roosting areas will be identified and protected.**
7. **Lack of undisturbed foraging areas has not been identified as a factor impacting bald eagles on the ANF.**
8. **Comment noted: Timber contracts will comply with all Forest Plan standards and guidelines related to the bald eagle.**
9. **The BA (12/98) and BO (6/99) analyzed potential impacts to threatened and endangered species. The BO determined that projects that implement the Forest Plan would not jeopardize the bald eagle. It provided terms and conditions to minimize take. The East Side project will not result in any additional impacts beyond those identified in the BO.**

Comment 129-178

E. Bigmouth Shiner (Notropis dorsalis)-

1. The bigmouth shiner is listed as a state Threatened species in Pennsylvania. It is also known to occur within the Allegheny River watershed. Habitat is found throughout the Allegheny. The Forest Service has not conducted the necessary surveys before preparing the East Side Draft EIS that are required by the Forest Plan starting on page 4-37. Additionally, no Management Plan has been developed for the species as required by the Forest Plan, also on page 4-37. The East Side Draft EIS does not consider impacts to this species that could occur as a result of the East Side Project. The Draft EIS should be withdrawn until necessary Management Plans, Forest Plan Amendments, and Forest-wide EISs have been conducted. Human disturbance and siltation levels are considered major limiting factors for the survival of the bigmouth shiner (Argent et al. 1998).

2. Habitat loss and siltation are considered "key limiting factors" for this species and therefore any activity, such as logging or road construction, that could impact either habitat or increase siltation in this species' habitat should look carefully at its impacts on the bigmouth shiner (Argent et al. 1998).

See Comment 129-174.

Comment 129-179

F. Black Bullhead (Ictalurus melas)-

1. The black bullhead is listed in the state of Pennsylvania as an Endangered Species known to occur within the Allegheny River watershed. This species was recently upgraded to endangered status and should be considered by the Forest Service when implementing actions on the Allegheny. The East Side Project Draft EIS fails to acknowledge this new information and subsequently fails to analyze the impacts of the East Side Project on the black bullhead. Prior to preparing the East Side Project Draft EIS, the Forest Service conducted NO surveys for black bullhead within those watersheds affected by the East Side Project. Additionally, the Forest Service has prepared NO Management Plan for the State Endangered black bullhead as required by the Forest Plan on page 4-37 and therefore the East Side Project violates the NFMA.

See Comment 129-174.

Comment 129-180

G. Bluebreast Darter (Etheostoma camurum)-

1. The bluebreast darter must be considered when analyzing Allegheny timber sales. This state threatened species should be added to the Allegheny's sensitive species list and is known to occur on the Allegheny -- many of its Pennsylvania documented occurrences are on the Allegheny. The East Side Project fails to analyze impacts to the bluebreast darter.

2. The Forest Service has not developed the appropriate management plans as required on Forest Plan page 4-37 for the bluebreast darter. The bluebreast darter is not a migrant or visitor to the Allegheny but a resident state threatened species. In fact, a recent GIS-based analysis found that the bluebreast darter ought to remain listed as a state threatened species (Argent et al. 1998).

3. In addition to being listed as Threatened in Pennsylvania, the bluebreast darter is listed as Endangered in New York State.

4. Consistent with the requirements on Page 4-37 of the Forest Plan the recently completed report on fish species in Pennsylvania finds that "monitoring efforts should continue to ensure this species' presence in Pennsylvania" (Argent et al. 1998).

5. This species' habitat includes large, clean rivers (Argent et al. 1998). It is known to be highly susceptible to sedimentation (Rooney 1994). Therefore the East Side Project, which if implemented will take place in the drainages of Upper & Lower Sheriff Runs, Duck Eddy Run, Bush Creek, and Fools Creek which are tributaries to the Tionesta Creek watershed, should be considered for its potential impacts to this species unique habitat needs.

See Comment 129-174.

Comment 129-181

H. Brook Stickleback (Culaea inconstans)-

1. The brook stickleback. is a state candidate species that needs to be considered in the Draft EIS for the East Side Project. Please note that all 3 prior state candidate species are now extirpated due to failure to protect their habitats.

See Comment 129-174.

Comment 129-182

I. Burbot (Lota Iota)-

1. Inland river populations of the burbot are considered Endangered by the Commonwealth of Pennsylvania (Argent et al. 1998). This species is known to occur predominantly in the Allegheny River watershed and will be harmed if the East Side Project is approved. Surveys and Management Plans required by the Forest Plan have not been conducted. The Draft EIS for the East Side Project does not consider impacts to the burbot despite its state endangered status.

See Comment 129-174.

Comment 129-183

J. Butternut (Juglans cinerea)-

1. The Forest Service must conduct surveys and prepare a management plan for the butternut. Until such time that the appropriate actions are taken, the East Side Project Draft EIS must be withdrawn or the No Action alternative must be selected.

Butternuts are identified and protected during initial planning and project reconnaissance. Also, see page C-15 and C-43 of Appendix C.

Comment 129-184

K. Canada Lynx (Lynx canadensis)-

1. We believe that the East Side Project proposed action limits recovery options for the lynx. The Forest Service has not established any means for recovering large, extirpated species such as gray wolves (Canis 1upus) and lynx, or those species that are allegedly extirpated such as the eastern cougar (Puma concolor couguar). The Forest Service should incorporate measures (such as the proposed Landscape Corridor) for implementing habitat for these species.

See Comment 129-175.

Comment 129-185

L. Cerulean Warbler (Dendroica cerulea)-

1. The Forest Service must conduct surveys to determine use of the Allegheny by the cerulean warbler. This species is known to inhabit areas close to the Allegheny, and the Allegheny is known to be well within its range (http://birdsource.cornell.edu/warblers/results.html). In addition, the Allegheny provides cerulean warbler habitat (http://birdsource.cornell.edu/cewap/cewaspec.htm).

2. The Forest Service must conduct surveys to determine the use of the East Side Project Area by cerulean warblers.

3. The cerulean warbler is very sensitive to habitat alteration. It prefers old growth and mature forests, requiring large trees for its nests (Rooney 1994).

4. The Cerulean Warbler Project describes the concerns for the species as follows:

> The Cerulean Warbler (Dendroica cerulea) received one of the highest overall rankings in the national PIF prioritization scheme, and it ranks second in terms of immediate conservation concern in the Northeast (Rosenberg and Wells 1995). These priority rankings reflect both a small total population and a significant declining trend in the region (3.2% per year since 1966, based on Breeding Bird Survey data). In portions of the Northeast, however, Cerulean Warblers are thought to be expanding their range and population size. In many parts of its range, the species is not adequately by the Breeding Bird Survey (BBS) because of its low overall population density and patchy distribution. Accurate population trends, therefore, are unusually difficult to estimate.
>
> Based on a recent draft status assessment of Cerulean Warblers for the USF&WS (Hamel, unpublished report), it is clear that little or no reliable information on this species is available for many areas. Conservation planning for regional populations of Cerulean Warblers is hampered by our poor knowledge of the species' population status, habitat affinities, area requirements, and threats, even in areas that hold the bulk of the population (such as Pennsylvania and Western Virginia). The best hope we have for filling these gaps in our knowledge is by coordinating efforts of professional biologists and experienced birders through a simple protocol designed to survey Cerulean Warblers throughout the region (http://birdsource.comell.edu/cewap/ycer\varb.htm).

Clearly the cerulean warbler is a species that deserves special consideration on the Allegheny.

5. Models have been developed to assist managers in determining which habitats are likely to house cerulean warblers (http://www.esd.oml.gov/programs/SERDP/cwhab.html).

See Comment 129-174.

Comment #186

M. Channel Darter (Pereina copelandt)-

1. The Draft EIS fails to assess the impacts to the channel darter, a state threatened species recently proposed for the Allegheny's Sensitive Species List. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment.

2. Access to the spawning areas and habitat degradation for the channel darter are considered key limiting factors (Argent et al. 1998). In particular, siltation is considered a threat to this species (Rooney 1994). The East Side Project analysis must consider these factors in its analysis and development of alternatives.

See Comment 129-174.

Comment 129-187

N. Clubshell Mussels (Pleurohena clava)-

1. The BO's "Reasonable and Prudent Measures" also set forth provisions for the northern riffleshell (Epioblasma torulosa rangiana) and clubshell mussels. These provisions also, according to the BO, include "current standards and guidelines found in the Forest Plan and amendments, and terms and conditions outlined in this opinion" (p. 70, emphasis added). Proceeding with environmental analysis on site specific actions when the programmatic analysis has not been amended to include significant environmental information, and the terms and conditions of the BO, constitutes arbitrary and capricious action and a violation of the NEPA, the NFMA, and the ESA.

2. The Forest Service has not incorporated the provision mandated by the terms and conditions of the BO into the East Side Draft EIS. Therefore the Draft EIS does not comply with the NEPA, the NFMA, and the ESA requirements to prepare an adequate environmental analysis than ensures protection of viable populations and the recovery of threatened and endangered species.

3. The clubshell mussel is harmed by sedimentation and siltation (Rooney 1994, USF&WS 1999). The Forest Service needs to more carefully consider the impacts of the East Side Project on this endangered mussel.

4. The East Side Project completely ignores potential impacts to the clubshell mussel. Despite the fact that this is a critically imperiled species on the federal endangered species list and inhabits waters downstream of the East Side Project Area, absolutely no analysis and NO effects determination has been made! The Forest Service's failure to analyze the impacts of the East Side Project on the clubshell mussels constitutes a violation of the NEPA, the NFMA, and the ESA. This is clearly arbitrary and capricious decision making.

5. What little discussion there is given to the clubshell mussel suggests that the East Side Project Area is not suitable habitat because of surveys done elsewhere in the Allegheny. The East Side Project Area has NOT been surveyed and this conclusion is clearly conclusory by nature (i.e. based on zero supporting evidence). 6. The U.S. Congress has afforded threatened and endangered species the highest priority. The Forest Service, by failing to survey for these species in the East Side Project Area has clearly violated the ESA.

7. "Fifty six of the 92 freshwater mussels native to the Mid-Atlantic Highlands Ecoregion are listed as endangered, threatened, or sensitive" (Rooney 1994). The Forest Service, by ignoring the impacts of the East Side Project on this endangered mussel, is furthering their endangerment. The Forest Service must develop an alternative that results in improved water quality. This alternative should include zero logging, zero road construction, and zero herbicide use and it should also should emphasize preserving and enhancing water quality through re-stabilization of stream banks and the removal of sedimentation sources such as roads, clearcut areas, and log landing areas.

Clubshell and northern riffleshell were not found in streams within the project area during mussel surveys. The East side FEIS complies with the terms and conditions in the BO.

Comment 129-188

0. Creeping Snowberry (Gaultheria hispidula)-

1. The Draft EIS fails to assess the impacts to the creeping snowberry, a state threatened species recently proposed for the Allegheny's Sensitive Species List. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment.

Creeping snowberry is addressed in Appendix C pp. C-15, C-39,C- 40, and C-43.

Comment 129-189

P. Eastern Sand Darter (Etheostomapellucida)-

1. The eastern sand darter is listed as an endangered species in Pennsylvania. It has many documented occurrences in French Creek and substantial suitable habitat on the Allegheny. However, the Forest Service has not conducted the necessary surveys to confirm or deny the presence of this species on the Allegheny. The East Side Draft EIS has not considered the potential impacts to this species that will result from the East Side Project. The Forest Service has not developed any Management Plans to outline what kind of surveying would be adequate to confirm or deny the presence of this species as required by the Forest Plan at page 4-37 and subsequent to the NFMA.

2. The eastern sand darter is facing extirpation throughout its range and must be given extra consideration in the analysis for East Side Project (Argent et al. 1998).

3. A key factor causing the eastern sand darter's decline includes the siltation of key habitat. The East Side Project will result in siltation within this species' habitat. For the benefit of the eastern sand darter, an alternative should be developed that includes zero logging and zero road construction. This alternative should also consider road removal, native tree planting (other than the weed species black cherry), and other restoration techniques that improve water quality - instead of merely mitigating the amount of habitat degradation.

See Comment 129-174.

Comment 129-190

Q. Eastern Small-Footed Bat (Myotis leibii)-

1. The Forest Service has not completed surveys for bats on the Allegheny. The Forest Service, however, has artificially and arbitrarily concluded that the eastern small-footed bat no longer lives on the Allegheny. The Forest Service must assume that the eastern small-footed bat uses the Allegheny until adequate surveys are completed.

2. The NEPA explicitly requires that when the Forest Service has incomplete information they are to pursue obtaining that information prior to the analysis (40 CFR § 1502.22 (a)). When the information is not available they shall clearly state so (40 CFR § 1502.22 (b)). The Forest Service has met none of the obligations under 40 CFR § 1502.22. In fact, studies are currently being conducted for the eastern small-footed bat and final reports will be available next spring. The Forest Service should not be assuming that the eastern small-footed bat is not within the East Side Project Area. There is suitable habitat, the East Side Project Area has not been surveyed, and Forest-wide surveys are still as of yet incomplete.

We have completed 3 years of extensive bat surveys on the ANF and have not documented any Eastern small-footed bats. In order for a species to be listed as sensitive, there must be a recent documented occurrence.

Comment 129-191

R. Eastern Cougar (Puma concolor cougar)-

1. The eastern cougar is listed as endangered and the Allegheny is within its range. It has been listed since 1973, and the failure of the Forest Service to add the cougar to the PETS list until 1993 was a violation of the ESA.

2. A comprehensive new study utilizing state of the art GIS technology completed by the Appalachian Restoration Campaign has identified a 1,200 square mile area in Forest and Warren Counties within the Allegheny as prime cougar habitat (Tavern et al. 1999).

3. A recent study headed by Dr. Melanie Culver of the University of Maryland has conclusively shown that all wild cougar living north of Nicaragua are part of the same sub-species of cougar -- the North American cougar (Puma concolor couguar), and all cougar living east of the Mississippi River are therefore entitled to protection under the ESA (Culver 1999).

4. The Draft EIS for the East Side Project must consider impacts to the cougar. It currently ignores impacts to the cougar.

See comment 129-175.

Comment 129-192

S. Eastern Woodrat (Neotoma magister)-

1. The eastern woodrat is a state threatened species that must be considered in the East Side Draft EIS. This is particularly true because its habitat requirements would be detrimentally impacted by the East Side Project. Consider the following published on the DCNR web page:

> PREFERRED HABITAT: The eastern woodrat does not thrive around civilization. it prefers rock strewn sites, usually mountaintops and valley sides. There, under tree canopy, a cave or boulders provide the network of subsurface crevices that shelter woodrats. This and their nocturnal habits make the woodrats largely unknown among the general public.
>
> REASONS FOR BEING THREATENED: The eastern woodrat has been classified as threatened because populations have suffered significant declines across the northern part of its range. The woodrat is no longer found in Connecticut and New York. In Pennsylvania they are absent from many historic sites, particularly in the eastern part of the state. Where they persist, their numbers are low.

See comment 129-174.

Comment 129-193

T. Gilt Darter (Percina evides)-

1. The Draft EIS fails to assess the impacts to the gilt darter, a state threatened species recently proposed for the Allegheny's Sensitive Species List. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment.

2. The gilt darter is a state threatened darter known to inhabit the Allegheny. The Forest Service has not conducted surveys for this species required by the Forest Plan on Page 4-37. The Forest Service has not prepared management plans for this species as required by the Forest Plan on Page 4-37. These are violations of USC 1604 (i) and therefore the East Side Draft EIS should be rescinded and revised.

See comment 129-174.

Comment 129-194

U. Gravel Chub (Erimystax x-punctatus)-

1. The Draft EIS fails to assess the impacts to the gravel chub, a state threatened species recently proposed for the Allegheny's Sensitive Species List. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment.

2. The recent GIS-based analysis regarding fish species in Pennsylvania found the gravel chub to be a species imperiled:

> Since 1925, the gravel chub (Ermiystax x-punctatus) has only been reported at nine locations in the Allegheny River Drainage (Argent et al. 1997). Cooper (1983) reports that this species is rare and widely scattered in Pennsylvania. In Kansas, this species is considered endangered (Platt 1974) and is now extirpated from many localities throughout the United States (Lee et al. 1980). The gravel chub is believed to be extirpated from Canada; the last specimens were captured in 1958 (Parker and McKee 1987b). This species is very sensitive to siltation and its presence may be indicative of good water quality (Scott and Crossman 1973). (Argent et al. 1998: 20-2 1)

3. The Forest Service must survey for this imperiled species. Any action that could potentially result in siltation in watersheds (this includes logging and road construction) could drive this species into not only state wide extirpation but potentially extinction. Despite this, the East Side Draft EIS does not consider the impacts on the gravel chub. Nor did the Forest Service survey for the gravel chub (as required by Forest Plan Standards and Guidelines on page 4-37) prior to preparing the Draft EIS. To make matters worse, despite the fact that the gravel chub has been listed by the Commonwealth of Pennsylvania as endangered for some time, the Forest Service has not prepared a management plan for the gravel chub pursuant to Forest Plan Standards and Guidelines on page 4-37. The lack of a management plan gravely concerns the ADP. The Forest Service has not prepared any of these mandated plans despite the fact that the requirement to prepare them has been in place since 1986. During this period of time the agency has approved tens of thousands of acres of logging but has taken zero action to prepare management plans to guarantee protections for PETS species.

4. The gravel chub is very sensitive to siltation (Rooney 1994). A zero-logging, zero-road construction alternative should be developed where any existing facilities causing siltation into potential habitat are restored or obliterated to maximize habitat for this endangered fish.

See comment 129-174.

Comment 129-195

V. Green-faced Clubtail (Gomphus viridifrons)-

1. The green-faced clubtail is an Allegheny sensitive species. The Forest Service has not surveyed for this species within the East Side Project Area. Because it is known to inhabit the Clarion River drainage, this species could potentially inhabit the Tionesta Creek watershed, which will be affected by the East Side Project. The Forest Service arbitrarily concludes that this species will not be impacted based on the idea that it allegedly does not inhabit the East Side Project Area. However, no surveys have been conducted.

Surveys for the green-faced clubtail, funded by the ANF found this dragonfly in the Clarion River, but not in streams within the project area (BA, Appendix C p. C-12).

Comment 129-196

W. Harpoon Clubtail (Gomphus descriptus)-

1. The Draft EIS fails to assess the impacts to the harpoon clubtail, a state threatened species recently proposed for the Allegheny's Sensitive Species List. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment. 2. The harpoon clubtail is known to inhabit East Hickory Run, East Branch of Tionesta Creek, Kinzua Creek, Salmon Creek, South Branch Tionesta Creek, and Tionesta Creek (Bier et al. 1997). East Side Project analysis must consider impacts on this species and its' habitats.

Harpoon clubtail survey results are presented in the BA (Appendix C p. C-13 and impacts address on pp. C-38, C-40, and C-43.

Comment 129-197

X. Horneyhead Chub (Nocomis biguttatus)-

1. The horneyhead chub is a state candidate species that needs to be considered in the Duck/Sheriff Draft EIS. Please note that all 3 prior state candidate species are now extirpated due to failure to protect their habitats.

See Comment 129-174.

Comment 129-198

Y. Indiana Bat (Myods sodalis)-

1. The BO's "Reasonable and Prudent Measures" set forth that "The Forest Service shall determine use of the Allegheny by Indiana bats during the hibernation, summer roosting, maternity, and pre-hibernation seasons" (p. 70). For the Forest Service to proceed with this environmental analysis before the most minimal and rudimentary assessment of the Indiana bat's use of the Allegheny has been determined for any of the seasons is clearly arbitrary and capricious action and constitutes a violation of federal law.

First of all, the information that we do have from Mike Gannon's two reports already indicates that the assumptions about canopy closure are both too simplistic and too low. All of the upland habitats where Indiana bats were recorded are areas of very high canopy closure. These habitats are also more indicative of the mesic-northern hardwoods old growth forests that used to dominate this landscape. They contain large numbers of standing snags and diverse understory structures. They do not, in any fashion, represent areas that have been logged in recent years either through thinning cuts or shelterwood cuts. Nor are they similar in structure and composition to such areas. Given the best available information before us, it is very clear that the assumptions drawn in the East Side BA and EIS are entirely inadequate, that the assumptions in the BO are already out of date, and until further research is completed (using radio-telemetry) the Forest Service must abandon the poor assumptions being made.

This statement in the Response to Comments on the Monarch Project give a strong indication of how the Forest Service falls to understand this process:

> Timber harvest treatments that reduce canopy closures to 60-80 percent provide optimum roosting habitat, and treatments that reduce canopy closure to 50-70 percent provide optimum foraging habitat.

This statement is entirely erroneous. First because Gannon's research suggests that foraging habitat is typically under higher canopy closure conditions. Second it is erroneous because it gives a false definition of optimum habitat. Optimum habitat for the Indiana bat is not simply a measure of canopy closure. There are a number of ecosystem components that make habitat suitable or optimal for the Indiana bat. Canopy closure is an attempt to measure only some of these components. Other essential components include the availability of large, dead snags with loose, peeling bark or cavities. Another component is the availability of food source. Indiana bats are canopy feeders and therefore susceptible to competition in less suitable habitats. Less suitable habitats may have "optimum" canopy closures but lack the structure needed by Indiana bats for foraging and/or roosting. Additionally, an area may be suitable for foraging but unsuitable for roosting, and vice-versa.

Comment 129-198 cont.

The Forest Service has used the best available scientific information for determining suitable and optimal habitat for Indiana bats. Canopy closure requirements for optimal roosting and foraging habitat are presented in Romme et al. (1995) and included in the Draft Indiana Bat Recovery Plan (1996). The Forest Service is completing the 3rd summer of Indiana bat surveys including thorough coverage of East Side treatments. Gannon's surveys have not documented Indiana bats exclusively in high canopy closures but quite the contrary (See BA 12/98, pg G-1 and G-2).

Comment 129-199

2. The Forest Service has failed to implement conditions of the BO that require the capture and tracking of Indiana bats to determine roost sites. In fact, the mitigation measures for the East Side Project include no protections for maternity roosts. Furthermore, until the Forest-wide research is done identifying the locations of roost trees, the Forest Service can not meet conditions of the BO that require the protection of maternity roosts. The lead researcher speaks to this point: "It should be noted that data from this study can assess only the areas used by bats during periods of activity (commuting to and use of areas as foraging sites). They can not address questions such as the location of roost sites, the type of trees or structure being used as such, or the presence of breeding colonies in the areas" (Gannon 1999). To proceed with the East Side Project as planned the Forest Service would not meet terms and conditions of the BO designed to protect Indiana bat maternity roosts.

3. Field work and data analysis for the 2-year bat survey of the Allegheny will NOT be completed until next spring at the earliest. To proceed with implementing the East Side Project based upon data that is incomplete would be both irresponsible and a violation of the NEPA, the NFMA and the ESA.

A partnership agreement is in place to use radio telemetry techniques to track any Indiana bats that are captured with the hopes of identifying roost sites. The Conservation Program incorporates the terms and conditions of the BO that require radio telemetry of Indiana bats (FEIS for T&E species on the ANF, pg A-7 and A-8 items 5b and 5c) and consultation with the FWS will be initiated if a maternity roost is located (FEIS for T&E, pg A-6 item # 1).

Comment 129-200

4. The following information on pge (SIC) C-4 is out of date:

> Pennsylvania has five known hibernacula (Hart et al., 1997) with an estimated population of about 270 Indiana bats (USDI-FWS, 1996). The closest known hibernaculum to the ANF is at Canoe Creek State Park near Altoona, about 75 miles southeast of the ANF.

First of all, the Forest Service knows that this information is out of date. This past winter, three new hibernacula were discovered in western/northwestern Pennsylvania. At least on of these new sites is of significant size (69 Indiana bats) and is now the second largest hibernaculum in the commonwealth. This hibernaculum is less than 50 miles from the Allegheny National Forest (which is in fact the logical migration point for bats in the new hibernaculum.)

In addition, the Forest Service can not ignore bats just because they live across state lines in the winter. Many Indiana bats hibernate in one state and summer in another. They are known to migrate upwards of 200 miles. Therefore it is significant that Ohio, West Virginia, and New York all are home to a total of more than 50,000 Indiana bats, many of which may be summering in the Allegheny National Forest.

The information concerning Indiana bat populations in Pennsylvania will be updated to include the new hibernacula found this past winter. Information concerning Indiana bat populations in other adjacent states is included in the BA (12/98) (p.15) and the BO (6/99) (pp. 29-32). Also, see Comment 129-27.

Comment 129-201

5. Recent research has found that Indiana bats are very selective about roost sites. In different parts of their range, Indiana bats are more or less selective about the tree species that they use. There are a number of potentially impacting climatic conditions that could influence Indiana bat roost selection on the Allegheny. Due to our northerly climate, it is likely that exposure to sun could be important. However, given the amount of annual rainfall, and the very low ph of that rainfall, it is probably more likely that atmospheric deposition is a greater influence on roost selection. During wet periods, Indiana bats have been found to roost farther away from forest openings in larger, more water resistant species of trees. Therefore it is likely that Indiana bats are very selective about the species of tree that they use. Research in Michigan supports this idea (Kurta 1999). Until the Forest Service completes radio-telemetry research, pursuing implementation of the Forest Plan could be dangerous to the viability of Indiana bats on the Allegheny. This would constitutes a violation of the NFMA.

Comment 129-201 cont.

The FWS concluded in the BO that implementation of the Forest Plan and projects predicated upon it would not jeopardize the continued existence of the Indiana bat (BO p. 61). The Forest Service has used the best scientific information available and is continuing to survey for Indiana bats in the hopes that radio telemetry will help us learn more about maternity roost. To speculate on roosting preferences without sufficient data is not appropriate.

Comment 129-202

6. This statement on page C-6 is highly erroneous:

> Tree removal does not discourage Indiana bats from using dead trees nearby as roosts, and, in fact, may make them more attractive by opening up the forest canopy allowing more sunlight to hit the tree making it warmer and thermally more stable (USDI-FWS, 1996).

The first problem with this statement is that it simply is not true. This research which was cited in the 1996 Draft Recovery Plan was described by Dr. David Pistole: "This study was done in one season and there was no follow up to verify any of these stated 'facts'. The newer version of the draft addresses some of these problems." (See our public comments on the Draft EIS for the proposed Forest Plan Amendment on Threatened and Endangered species.)

Ironically, the Forest Service cites the 1996 Draft Indiana bat Recovery Plan above. Their description on page C-4 of the history of management for the Indiana bat, however, leaves this document entirely out:

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

The cited 1996 Draft Indiana bat Recovery Plan is not the best available scientific information. This violates the NEPA.

The BO (6/99) and the Draft Recovery Plan (3/99) both state that " Indiana bats occupy highly altered landscapes…Anecdotal evidence suggests that the Indiana bat may, in fact, respond positively to some degree of habitat disturbance…Analysis of landscape changes in Missouri…provides strong convincing evidence that Indiana bats evolved in an open to semi-open savanna-like environment, at least in the western part of the species range…(BO p. 22).

Information from the 1996 and 1999 draft were used in the analysis (EIS p. C-39).

Comment 129-203

7. Merely the presence of suitable roost trees is not enough. Indiana bat selection of roost sites is based upon a number of variables. Indiana bats appear to prefer roosting areas where there are large number of optimal roost trees great than 12" dbh (Miller, 1996). Indiana bats have also shown to be very selective about what species of trees that they use (Kurta 1999).

8. Consider the following statement on page C-6:

> 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.

What about if multiple roost trees are lost? The East Side project proposes intensive even-aged cutting, with an emphasis on salvage cutting. The result will be that not just a few trees, but many trees will be removed from all areas where cutting is to take place. In addition, salvage logging areas will target the trees most likely suitable for Indiana bat occupation. In many areas, where removal cuts are planned, most suitable roost trees will be removed. If any of the proposed logging stands contain maternity populations of Indiana bats, those populations will most likely be lost. Given the size of many of the proposed cutting units (ranging well in excess of 300 acres), the likelihood that roosts will be particularly lost is very high.

9. The following statement made on page (SIC) C-7 has no supporting basis. It appears to be a conclusion but it has no support:

> 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.

Comment 129-203 cont.

This statement is very important. What does "area" mean? What type of "area" are we talking about? Stand sized area? Compartment sized area? Watershed? Forest? This statement may be true for some of these scales, but is it true for all? The existence of potential roost trees in otherwise unsuitable habitat, for example, should not be counted in the available supply.

All terms and conditions in the BO for retention of live and dead trees in salvage and green units will be implemented (BO p. 72). This will minimize take of Indiana bats as a result of 7,883 acres of timber harvest treatments (<6%) within the 139,990 acres of the East Side project area. At least 5-10 snags >9 inches dbh per acre of which one snag is >16 inches dbh will be retained in all salvage units (BO p.72).

Comment 129-204

10. On page C-7, when the BA addresses what conditions influence the existence of Indiana bats in a particular area, why is climatic conditions ignored? Certainly, the fact that many researchers have found Indiana bats using interior forest roosts exclusively during wet periods is an important factor?

The extensive discussion of summer roosting habitat (EIS p. C-6 through C-7) is based on the best scientific information available. Movement between roost sites due to climatic changes is addressed on page C-6 of the Appendix C. Indiana bats may use closed canopy roosting sites during periods of rainy weather and may need open, exposed roosting sites during cool weather.

Comment 129-205

11. Page C-7 states that "Streams, wetlands, small ponds, and even road ruts provide drinking water for Indiana bats as they forage during the summer months." Please provide all documentation of Indiana bats drinking from road ruts. Given the fact that there is no shortage of any of the above habitat, what is the purpose of the 7 artificial ponds proposed in the East Side EIS? This proposal is ridiculous. The Draft EIS and Forest Plan Amendment does not propose that ponds be constructed on the forest. Who identified drinking water as a limitation for Indiana bats?

Indiana bat use of road ruts as a source of drinking water is documented in the Mark Twain National Forest Biological Assessment (1998). Additional water sources may enhance habitat but are not considered limiting to Indiana bats on the ANF.

Comment 129-205a

12. Once again, the discussion on page C-7 fails to incorporate the best available scientific information. There are a number of potential hibernacula near and within the Allegheny National Forest boundary. There are also known occupied hibernacula closer to the Allegheny than Canoe Creek State Park.

We will incorporate the discovery on new hibernacula from this past winter into the FEIS. Also, see Comments 129-27 and 129-200.

Comment 129-206

13. The following statement on page C-8 is false:

> Virtually every acre of the ANF contributes in some way towards maternity landscape/roost habitat and foraging habitat.

First of all, Indiana bats are very discriminating about what habitats they use. They fill a unique niche in the forested ecosystems of the Allegheny. The logic presented above assumes that Indiana bats live in a vacuum. The fact of the matter is that Indiana bats have to cooperate with other species in order to survive. Increased human manipulation of the natural environment has resulted in increased demand for particular habitats, and therefore created increased competition where cooperation was once an option. Basic habitat requirements of the Indiana bat are similar to those for the Northern long-eared bat. Both bats use similar habitat components as do other bats, birds, and small mammals. (Kurta 1999)

So why is the above statement false? Second growth forests have limited habitat capacity. Consider this statement from the 1998 Monitoring and Evaluation Report:

> Most managed second-growth forests have relatively low amounts of both snags and logs compared to unmanaged second-growth or true old-growth forests.

When we read this we nearly fell off of our seats. The Forest Service is acknowledging that forest management reduces essential ecosystem components such as snags and logs? It can not be! Nevertheless, it

Comment 129-207 cont.

is good to see the Forest Service acknowledge science for a change. But it also sheds an important light on our analysis here. Given the needs of the Indiana bats and a number of other bats, mammals, and birds, there is high demand for ecosystem components that are negatively impacted by ongoing forest management activities -- especially snags and logs. Given the amount of forest that has been actively managed within the East Side Project Area, the amount of optimal habitat conditions, where the Indiana bat would not forced to compete with a number of species, decreases significantly. With East Side proposing intensive management of a large percentage of the project area, the result will likely be that only a fraction of what would have been potentially suitable habitat will continue to be suitable. Add the fact that East Side proposes more than 3,000 acres of "removal" clearcuts and you realize that, in fact, it can not be true that virtually every acre of the ANF contributes towards Indiana bat habitat.

We have stated that virtually every acre <u>contributes</u> in some way towards roosting and foraging habitat. We did not say that each acre is optimum habitat. All acres of the ANF have insects – the food source for Indiana bats, and most acres have live and dead trees – potential roosting sites.

Comment 129-208

14. We would like to address the "findings" displayed on page C-8. First of all, the rationale behind some of these findings is highly flawed. The Forest Service conducts separate analyses. One analysis focuses on canopy closure. Another focuses on the distribution of dead and live trees. It is very important to note that for this analysis to be useful the two need to be cross-referenced. Acreage that has appropriate canopy closure but lacks suitable dead trees is not potential habitat. Acreage that has appropriate dead tree composition but lacks appropriate canopy conditions is not potential habitat. Only acreage that has a combination of all necessary habitat requirements can really be considered suitable habitat.

Two separate analyses were used to quantify the average distribution of dead and live trees and the average distribution of canopy closure. A number of variables were examined to determine whether or not the distribution of dead and live trees was affected and no differences were found. Therefore, it is reasonable to assume that the forest-wide distribution of dead and live trees would be the same, regardless of the level of canopy closure.

Comment 129-209

15. Research shows that stands where even-aged thinning cutting is applied have resulting very low densities of dead trees. This means that areas where thinning cutting is applied lack the necessary habitat conditions to be considered suitable habitat. In some areas, where thinning cutting is poorly applied (a common problem) tree health in the remaining stand an rapidly decline. The problem here is that the thinning reduced the number of available trees, creating a situation where decline can be more disastrous to forest health than in unmanaged forest areas.

Analysis of stand data in areas which have received an intermediate thinning shows that optimal Indiana bat habitat conditions are found for all sizes of dead and live trees with the exception of large diameter dead trees (BA,12/98 p.E-12). All snags will be retained in "green" thinnings and 5-10 snags per acre will be retained in salvage thinnings per terms and conditions in the BO (p. 72).

Comment 129-210

16. The following statement on page C-8 has serious flaws that are not supported by the East Side BA:

> Currently, there are over 187,600 acres of maternity landscape habitat in an optimal condition (37 percent of the ANF). The potential exists to develop an additional 163,400 acres of optimal habitat, forest-wide (32 percent of the ANF) by reducing canopy closure.

First of all, optimal habitat can not be measured by one single factor. Canopy closure has no relationship to the number of potential roost trees in an area of forest. While the Forest Service argues that even-aged thinning cuts result in optimal canopy closure conditions, it does not result in optimal snag conditions. Research shows that Indiana bats prefer areas where suitable roosts (large dead snags > 10" dbh) are available (Callahan 1993). Research also shows that even-aged thinning cuts on the Allegheny result in very low numbers of dead trees, let alone dead trees with > 12" dbh (Stout 1995). The results of even-aged thin cutting on the distribution of future dead trees is well represented in the figure below:

FIGURE 3 did not reproduce. See letter #129, p. 85 in the project file

This kind of impact could prove fatal to Indiana bats. The cumulative effects analysis needs to consider that the Forest Plan calls for some 9,400 acres of even-aged thinning cuts on the Allegheny each year. This

Comment 129-210 cont.

means that the Forest Plan authorizes that 2% of the entire Allegheny National Forest (and therefore 2% of the East Side Project Area) is to receive these treatments that will make forested areas far less suitable for Indiana bats than if left "unmanaged".

Definitions of suitable and optimal habitat Indiana bat habitat are taken from Romme (1995). Thinnings reduce canopy closure to optimum foraging and roosting habitat. As described in Comment 129-209, snags will be retained in all thinnings based on the terms and conditions in the BO (p. 72).

Comment 129-211

17. The above facts are even more dis-concerting since only 38% of the Allegheny contains optimal quantities of 9" dbh dead trees:

Optimal distribution of 9" diameter dead trees are found (38 percent of the ANF).- page C-

Comment noted. However, all snags will be retained in all green units and 5-10 snags per acre will be retained in salvage units (BO p.72).

Comment 129-212

18. How many acres where 9" dbh dead trees are found are being treated as part of the East Side EIS?

We have completed our analysis of habitat for Indiana bat at a landscape scale, rather than at the scale of individual stands. (Appendix C pp. C-8 to C9) Individual stands, in and of themselves, are not large enough to provide adequate data to assess habitat. While measures of habitat can be made at the stand level, it is necessary to evaluate the degree of change that occurs across the landscape. The information presented on C-8 pertains to the forest-wide distribution of habitat.

Additional information on the landscape distribution of dead and live trees *within the project area* can be more accurately described by using a more recent set of data collected during the 1998/1999 field season. This data is representative for a 201,208 acre portion of the ANF that includes the East Side project area. This data shows that habitat requirements for dead trees in the 9" and 12" diameter classes are met, however there is some question as to the distribution of 20" diameter dead trees.

These comments imply that management in stands where dead 9" and 12" trees are found is harmful to bats. We do not agree with this conclusion. The terms and conditions outlined in the BO, (which have been incorporated as standards and guidelines through amendment to the Forest Plan) ensure that adequate numbers of dead and live trees are retained in stands where timber harvest activities occur.

You have misquoted Dr. Gannon's findings on bat research on the ANF. Nowhere in his two reports to the ANF does he state that Indiana bats prefer upland habitats with higher than 70% canopy closure. The analysis of roosting and foraging habitat is based on the Habitat Suitability Index developed by Romme et al (1995).

Comment 129-213

19. How many acres where optimal distribution of 9" diameter dead trees exist also have suitable canopy closure conditions?

See Comment 129-212.

Comment 129-214

20. How many acres where optimal distribution of 9" diameter dead trees exist also have optimal canopy closure conditions? Please adjust canopy closure requirements to reflect two years of bat research conducted by Dr. Michael Gannon. Canopy closure requirements for upland habitat are higher than previously thought.

See Comment 129-212.

Comment 129-215

21. The above facts are even more dis-concerting since only 28% of the Allegheny contains suitable quantities of 12" dbh dead trees:

> Suitable distribution of larger diameter (12 inch trees) are found (2 8 percent of the ANF).page C-8

Comment noted. However, all snags will be retained in all green units and 5-10 snags per acre will be retained in salvage units (BO p.72).

Comment 129-216

22. How many acres where 12" dbh dead trees are found are being treated as part of the East Side EIS?

See Comment 129-212.

Comment 129-217

23. How many acres where optimal distribution of 12" diameter dead trees exist also have suitable canopy closure conditions?

See Comment 129-212.

Comment 129-218

24. How many acres where optimal distribution of 9" diameter dead trees exist also have optimal canopy closure conditions? Please adjust canopy closure requirements to reflect two years of bat research conducted by Dr. Michael Gannon. Canopy closure requirements for upland habitat are higher than previously thought. How many acres on the Allegheny

Dr Gannon did not assess canopy closure conditions on bat survey sites nor did he reach any conclusions on canopy closure requirements on upland sites. Also, see Comment 129-212.

Comment 129-219

25. Most importantly, how many acres contain all of these components:
a) optimal quantities of 9" diameter dead trees
b) optimal quantities of 12" diameter dead trees
c) optimal roosting canopy conditions

See Comment 129-212.

Comment 129-220

26. Additionally, how many acres contain all of these components:
a) suitable quantities of 9" diameter dead trees
b) suitable quantities of 12" diameter dead trees
c) suitable roosting canopy conditions

See Comment 129-212.

Comment 129-221

27. This analysis is inadequate. The following conclusion is not supported within the East Side BA:

> Assessment of foraging habitat consists of an evaluation of the distribution of acres between different levels of canopy closure.

As we have already indicated above, looking solely at canopy closure for habitat assessment is entirely inadequate. Just because an area falls within "optimal" canopy closure does not mean that it constitutes "optimal" habitat. As demonstrated in the graphic above, thinning cutting results in less than optimal conditions of snags which constitute suitable roost trees. It is also important to note that only 28% of the Allegheny contains suitable roost trees.

As described in Comment 129-210, canopy closure requirements for suitable and optimum foraging habitat are provided in Romme et al. (1995).

Comment 129-222

28. The Forest Service foraging analysis continues on page C-8:

> There are over 99,400 acres of foraging habitat in an optimal condition (19 percent of the ANF). The potential exists to develop an additional 257,400 of optimal habitat, forest-wide (50 percent of the ANF) by reducing canopy closure.

Once again we have to point out that simply reducing canopy closure does not create "optimal habitat." There is no research that supports the idea that Indiana bats prefer forested areas that have been logged for foraging. In fact, two years of research by Dr. Michael Gannon confirms that Indiana bats prefer upland habitats with higher than 70% canopy closure. This, however is not reflected in the East Side BA. The East Side BA fails to incorporate the best available scientific information.

You have misquoted Dr Gannon's findings on the ANF. Nowhere in his 2 reports to the ANF does he state that Indiana bats prefer upland habitats with higher than 70% canopy closures. As stated In Comments 129-210 and 129-221, the analysis of foraging habitat is based on the Habitat Suitability Index developed by Romme et al (1995).

Comment 129-224

29. The analysis on page C-9 is confusing. Instead of determining how many acres meet the requirements for live and dead tree composition, the Forest Service does an average over the whole area of live and dead tree distribution. This does not really make sense. A single area with high concentrations of dead trees could throw off the mean. This is particularly true since the project area includes the Tionesta Scenic and Research Natural Areas. These old growth areas would have very high concentrations of large dead trees and more than likely carry the bulk of dead and dying trees of significant size. It is very likely that a very high number of ~: 20" diameter dead trees, for example, fall within the Tionesta Scenic and Research Natural Areas. Given this, it is probable that the remainder of the East Side Project Area falls well below optimal conditions.

A more efficient manner of assessing the suitability of lands within the East Side Project Area would be to determine the acreage of lands that provide each of the following characteristics:

a) 5 or more dead trees with ³ 9 diameter;
b) 1 dead tree per 10 acres with ³ 12" diameter;
c) I dead tree per 2 acres with ³ 20" diameter;
d) ³ 30% of landscape in forested cover;
e) 16 or more live trees per acre with ³ 9" diameter;
f) 3 or more live trees per acre with ³ 3 " diameter; and
g) forested areas with ³ 54% canopy closure.

The above analysis should ideally be strengthened to reflect Callahan's finding that optimum habitat include large quantities of dead trees with diameters ~! 12". 1 dead tree per 10 acres hardly reflects Callahan's findings. The above analysis should also be adjusted to reflect the higher canopy closure measures demanded by Indiana bats on the Allegheny as evidenced by Dr. Gannon's research.

The analysis of suitable and optimum habitat is based on Romme et al. (1995). A detailed analysis of canopy closure and dead and live tree distribution was completed in the BA (12/98) (Appendix E) and used to determine habitat quality in the East Side Project Area. Also, see Comments 129-210, 129-221 and 129-223.

Comment 129-224

30. What does the following statement at the bottom of page C-9 mean?

> Sample is for Mortality Zones 6, 7 and 8 covering 201,208 acres.

Is this saying that the data in tables 3 and 4 does not reflect the East Side Project Area? If this is true than we have a serious problem here. This data is useless.

Data on Appendix C, Tables 3 and 4 are derived from Forest Health Monitoring plots taken during the 1998 and 1999 field seasons. They represent the condition of vegetation found on a 201,208 acre portion of the ANF, that includes the 139,990 acre East Side project set. These data are directly applicable to this analysis.

Comment 129-225

31. The following statement underlines the serious problem with the analysis:

> Snags and dead trees are abundant on the sites proposed for treatment.

Well, duh, that is good for Indiana bats. Remember Indiana bats prefer sites where there is an abundance of large dead trees to serve as potential roosts (Callahan 1993). It is likely that the very areas that the Forest Service desires to cut down are preferred Indiana bat habitats.

But the East Side BA goes on:

> An assessment of the present condition of the treatment areas indicates current numbers of dead and live trees exceed optimal requirements (see Tables 3 and 4).

So what data is represented in Tables 3 and 4? The above statement on page C-28 suggests that Tables 3 and 4 reflect solely data on proposed treatment areas. But what then of surrounding habitat? What if the proposed treatment areas are the best available habitat? If this is true then the Forest Service is taking the Indiana bats best habitats. This could crush Indiana bat populations within the Project area.

Alternately, however, the Forest Service has also implied on page C-9 that Tables 3 and 4 represent something else:

> Sample is for Mortality Zones 6, 7 and 8 covering 201,208 acres.

If this is true than Tables 3 and 4 have nothing to do with the dead tree distribution of proposed "treatment" (aka. logging) areas. If this is true than the above statement on page C-28 is pointless and irrelevant -- not to mention false.

Tables 3 and 4, Appendix C, compare the live and dead tree habitat requirements for the Indiana bat with the existing habitat within the East Side Project. For optimal habitat you need 5 snags per acre greater than 9 inches and East Side has 10.3 snags per acre. You need 1 snag greater than 12 inches per 10 acres and East Side has 4.4 per acre. You need one 20 inch snag per 2 acres and East Side meets that criteria. This analysis is applicable to treatment areas within the East Side project.

Comment 129-226

To make matters worse, page C-9 also suggests that:

> A comparison of the existing live and dead trees within the project area with the live and dead tree requirements in the HIS model are provided in Tables 3 and 4.

So now we have a third explanation for the data contained in Tables 3 and 4. Whatever the data is, however, is somewhat irrelevant because the analysis method is meaningless as demonstrated earlier in these comments. The Forest Service needs to conduct an actual analysis to determine each of the following:

a) How many acres are in optimal condition for all categories;
b) How many acres are suitable in all categories; and
c) How many acres are not suitable in all categories.

Each of the above categories should be mapped using GIS to determine spatially where suitable and optimal habitat lies. These comparison should be made for present conditions and predicted outcomes for each of the action alternatives (and Zero-cut which needs to be given detailed analysis.)

The analysis of Indiana bat habitat conditions within the East Side project area is based on the Habitat Suitability Index Model developed by Romme et al (1995). The data is relevant and meaningful. Also, see response to Comment 129-225.

Comment 129-227

32. We do not agree with the conclusion on page C-29 that "sufficient roosting habitat in the form of live and dead trees is provided under all alternatives." Without conducting the above analysis by alternative such a determination is not possible. Furthermore, the mitigation measures outlined on pages C-28 and C-29 do not guarantee that "sufficient roosting habitat" is provided for. Instead, the listed mitigations merely ensure that Incidental Take is minimized.

The conclusion concerning sufficient roosting habitat is based on the live and dead tree requirements found in the Habitat Suitability Index model (Romme et al. 1995). The live and dead tree habitat requires are exceeded in the East Side project (Tables 3 and 4 p. C-9).

Comment 129-228

33. It should also be noted that mitigations 7 and 8 require knowledge of roost trees and maternity sites. The Forest Service has not conducted any research to make these determinations. Without this knowledge, to claim that these mitigations will be effective is nonsense. It is imperative that aggressive research in this area is completed *before* the East Side EIS is finalized.

We have used the best scientific information available to analyze impacts and propose mitigation. Bat surveys are continuing across the ANF and any Indiana bats that are captured will be fitted with a radio in the hopes of tracking it to a roost. Once a maternity roost is located, additional consultation with the FWS will proceed.

Comment 129-229

34. Why isn't there a cumulative effects analysis looking at the impacts of each Alternative on the distribution of live and dead trees of sufficient size for Indiana bat use? This analysis is clearly important but it is left out of the East Side BA. This is inappropriate.

An analysis of live and dead trees is provided in Tables 3 and 4 (pp. C-9 & C-10) and is based on suitable amounts of live and dead trees in the HIS model (Romme et al 1995). This analysis also incorporates the live and dead tree analysis from the BA (12/98) (Appendix E) and the BO (p. 68) The BO suggests that a minimum of 18,302 potential roost trees would be available for each Indiana bat on the ANF (BO p. 68). Additional cumulative effects to Indiana bats are contained on pages C-35 and C-36 of Appendix C.

Comment 129-230

35. The East Side proposed action will move the Project Area towards unsuitable conditions. It is suspicious that Tables 19 and 20 ignore "suitable" canopy closure conditions but focus on "optimal." This is suspicious because that is where most of the impacts are. Furthermore, when creation of "optimal" canopy closure occurs through even-aged cutting, the result is less than optimal in terms of large dead trees for roosting and foraging. Thus Tables 19 and 20 present a mis-leading picture by looking at only one component of habitat requirements. Therefore, the East Side BA conclusions are largely erroneous.

Currently 61% of the treatment areas in the East Side project are in suboptimal roosting habitat and 39% are in optimal roosting habitat. Under Alternative 1, 52% of the treatment areas would be in suboptimal roosting habitat and 48% would be optimal roosting habitat (See Table 16, p. C-35). Alternative 1 represents an overall improvement in roosting habitat. For foraging habitat, the total percent of treatment areas with suboptimal and optimal habitat does not change between the current condition and Alternative 1.

Comment 129-230

36. The erroneous nature of the cumulative effects discussion on pages C-33 and C-34 is disgusting. The Forest Service ignores two years of findings by Dr. Michael Gannon that Indiana bats prefer higher canopy closures than 50 to 70% in upland habitat on the Allegheny. The Forest Service ignores other habitat components such as the number of dead and live trees that provide current and future available roosts. As demonstrated by Stout et al in their paper, even-aged logging greatly reduces the concentration of dead trees and bio-mass within stands (1995). This does not constitute optimal habitat conditions. The East Side analysis is highly inadequate. Hence it is that false conclusions can be drawn such as this one on page C-33:

> Alternatives 2 and 5 represent a 50% reduction in optimal habitat from the present condition. These latter two alternatives do not appear to meet the intent of the ANF DEIS for Threatened and Endangered Species on the Allegheny National Forest.

There are so many reasons why this conclusion is flawed:

Comment 129-231 cont.

a) There is, for example, a 35% decrease under Alternative I in suitable habitat. Alternative 5 would not result in such a decrease.

b) The conclusion that Alternative 5 would represent a reduction in optimal habitat has no basis. The entire EIS, including Table 19, lacks an analysis of the site-specific outcomes if Alternative 5 is selected. There is absolutely no basis for the conclusions that are drawn. In fact, if it is true that the trees are dying and that is why we need to cut them down then Alternative 5 would result in the best of both worlds: optimum canopy closure (due to decline in canopy) and greater numbers of potential roost trees (resulting from dying trees).

c) It fails to look at other habitat components such as the availability of roost trees. Instead, the false conclusion is drawn that optimal canopy closure means optimal habitat.

d) Finally, the analysis fails to take into consideration two years of research conducted by Dr. Michael Gannon which detected Indiana bats foraging primarily in areas of water or high canopy closures. This EIS is a joke. It can not be taken seriously when the analysis is so seriously bent to mislead the public about the effects of the proposed logging. Suggesting that canopy closure can be a single measurement for what constitutes optimum habitat for the Indiana bat is both ignorant and deplorable.

Dr. Gannon has not completed any analysis of habitat or canopy closure for Indiana bats on the ANF. Dr. Gannon's work has focused on surveys for determining the diversity and distribution of bats on the ANF. Surveys have focused on providing broad survey data across the ANF and surveys have focused on areas where bats are most likely to be captured or detected. Additional cumulative effects related to live and dead trees are found in the BO. The FWS concluded that assuming a population of 400 Indiana bats on the ANF, there would be more than 18,000 potential roost trees per bat (BO p. 68).

Cumulative impacts to roosting and foraging habitat for each alternative are provided in Tables 16 and 17 (pp. C-35 and C-36). As stated in Comment 129-230, roosting habitat improves and overall foraging habitat remains the same between the current condition and Alternative 1. The cumulative effects analysis is based on the HIS model (Romme et al. 1995).

Comment 129-232

37. The Same criticisms for the roosting habitat detailed in Table 19 apply to the analysis of foraging habitat. Conclusions about the impacts under Alternative 5 can not be drawn without a site-specific analysis for Alternative 5. The East Side EIS is totally inadequate for failing to provide this.

Cumulative effects to roosting habitat are provided in Table 16 (p. C-35). Also see Comment 129-230.

Comment 129-233

38. Site 18 of Dr. Gannon's 1998 survey for bats on the Allegheny was done in the Six Pipes timber sale area. The area surrounding the survey was being logged at the time. This site resulted in the least number of bat calls of any of the sites. In fact, the second visit to the site resulted in zero detected calls. This suggests that logging is likely detrimental to localized bat activity during implementation. This site should be studied for post-implementation bat activity. In addition, the analysis for East Side Project must consider the impacts during logging activity on the Indiana bat.

This is a misrepresentation of Dr. Gannon's survey data. Number and diversity of bats captured varies each time a site is surveyed. To attribute this variation to nearby logging activity is inappropriate.

Comment 129-234

39. The BO requires that the Forest Service use radio-telemetry technologies to locate roost sites on the Allegheny. To date no such efforts have taken place. Until these technologies are utilized, as required by the BO, the Forest Service would have no way of being certain that they have not violated other terms and conditions of the BO that require that protection of roost trees. To comply with the Terms and Conditions of the BO these surveys must be conducted before a Forest-wide analysis is completed. The East Side Project can not proceed until the Forest Plan is then amended, site specific surveys conducted, a revised EIS on the East Side Project is prepared, and all citizens' appeal rights have been exhausted.

We are prepared to place a radio on an Indiana bat and track it to its roost, once one is captured. Efforts are continuing to try to capture an Indiana bat. There is nothing in the BO that requires the telemetry work to be completed before project implementation can proceed.

Comment 129-235

40. The ADP is disappointed by not being able comment on the outcome of the ongoing Forest Plan amendment process. Since that process is on-going it is not clear what issues might develop as a result of that process. This makes it virtually impossible to fully participate in the public involvement process for the East Side EIS. There are a number of issues that can not be adequately addressed on the project level. Furthermore, these issues have never been considered in a NEPA statement for the Allegheny (since all NEPA statements to date assumed the Indiana bat was absent from the Allegheny). To complicate matters further, the Forest Service is depending heavily on the reliability of a BO issued by the USF&WS which is based on some poor information. Because the BO does not go through public review we have been denied the opportunity to address these issues. For example, the BO draws conclusions based in part on a mis-interpretation of statements by John MacGregor, a member of the Indiana Bat Recovery Team:

> ------- Original Message -------
> From: MacGregor John/r8 danielboone@fs.fed.us [
> mailto: MacGregor
> John/r8 danielboone@fs.fed.us]
> Sent: Thursday, July 15, 1999 2:32 PM
> To: jbensman@ezl.com; jmacgreg/r8 danielboonel@sv2wo.wo.fs.fed.us; rbraun/r8 danielboone@sv2wo.wo.fs.fed.us; dkrusac/r8@sv2wo.wo.fs.fed.us; robert currie@mail. fws. gov
> Subject: Response to "Is the USFWS mis-citing you?"
>
> Jim, on 7/12 you wrote to ask if the USFWS (presumably the PA Field Office) was mis-citing me. The simple answer is yes.
>
> My memory and my telephone log for 3/3/99 tell me that on that date I received a telephone call from a USFWS Field Office representative (NOT from Pennsylvania) and was asked to (1) confirm an estimate of an average of 20 potentially suitable Indiana bat roost trees (or more) per acre in forest greater than 50 years old on the Daniel Boone, and (2) provide a rough estimate of the number of Indiana bats present during the summer months on the Daniel Boone.
>
> I reluctantly made an attempt to provide this information with the understanding that (1) the potentially suitable roost tree category would include living Class I and Class 2 trees (ex Romme' et al) and living trees of other species that Indiana bats were known to use on the Boone (shortleaf pine, Virginia pine, scarlet oak, etc.) after they died or were damaged, not just the immediately suitable roost trees and the snags, and (2) the bat estimate would be just that - an estimate - a SWAG - and should not be considered firm, documented, or well supported.
>
> I did NOT say that there was an average of 20 immediately suitable roost trees per acre on the Daniel Boone.
>
> To answer your questions -
>
> Yes, I feel that my answers were misrepresented, possibly due to miscommunication. Yes, loyalty to habitat should be taken into account, and we now have data showing that at least some individual males from the Somerset study area will use the same roosting areas, and even some of the same roost trees, over multiple seasons and multiple years (others may not, of course).
>
> I have explained above how I came up with the numbers. These numbers are very low end, in my opinion.
>
> Words cannot express the disappointment that I felt when I saw the results of what I thought was a private telephone conversation between two biologists suddenly appearing in Biological Opinions issued by USF&WS - particularly when my input was not accurately conveyed. I suppose that a person is never really "off the record" unless he keeps his thoughts and data to himself – another of life's painful lessons that must be learned over and over and over…

Comment noted. ADP was provided an opportunity to comment on the DEIS for the Threatened and Endangered Species Amendment in the Spring/early Summer of 2000. We are now moving forward with NEPA documents for specific projects. Mis-interpretation of information in the BO is outside the scope of this EIS.

Comment 129-236

41. The Indiana bat has been on decline in Pennsylvania. It is listed as a state endangered species and used to live in much greater numbers (~5,000 bats). The Forest Service has a responsibility to pursue the preservation and enhancement of Indiana bat habitat. Instead the East Side Project proposes to take suitable habitat and make it unsuitable habitat.

The Forest Service proposed to reduce the percent of unsuitable roosting habitat and increase the percent of optimum roosting habitat in treatment areas (See Table 16 p. C-35).

Comment 129-237

42. The 130 issued by the USF&WS requires that the Forest Service survey for Indiana bats. Terms and Conditions on page 74 of the BO requires that the Forest Service "Conduct surveys to identify if and where Indiana bat maternity sites are located on the ANF. Surveys efforts should be focused on those areas which based on habitat characteristics (e.g., percent canopy closure, presence of suitable roost trees, proximity to water, etc.) and/or previous survey results (e.g., Anabat detection), appear to be conductive to maternity colonies. Surveys should be done using the latest Fish and Wildlife Service-approved survey protocol and qualified surveyors. If any Indiana bats are netted, they should be tracked using radio-telemetry to identify roost trees am foraging habitat. ... Some of these surveys shall be conducted in proposed timber harvest areas, especially in those areas where canopy closure will be reduced to <54% (page 74)."

43. Furthermore, the Forest Service has not initiated any efforts to survey for the Indiana bat using radio-telemetry. According to a September 3, 1999 article in the Bradford Era:

> Insects are what draw the bats to this location, Gannon explains. The bats now flitting through the dusky air have probably flown a mile or more from the trees where they sleep during the day.
>
> To find these trees - called "roost trees" - Gannon would like to attach tiny radio transmitters to bats captured in the mist nets.
>
> Forest Service spokeswoman Kathe Frank said the Forest Service would be interested in a radio-tracking effort if funding sources can be found (Buck 1999b).

Kathe Frank is admitting that the Forest Service is failing to meet the terms and conditions of the BO by not currently implementing radio-tracking efforts. The East Side Project can not proceed until the Forest Service comes into compliance with the BO.

These surveys have been initiated and are completed for the East Side Project. To date, no Indiana bats have been captured so no radio telemetry techniques have been employed. Funding for the telemetry work has been secured and partnership agreements are in place. The ANF is in compliance with the BO.

Comment 129-238

44. Dr. Gannon's comments on the Indiana bat Recovery Plan make our point clearly and concisely: "Destruction of summer habitat, whether it takes place during the summer when Indiana bats are active, or during the winter when they are hibernating, can potentially have a great impact on Indiana bat populations" (available from the USF&WS). Without conducting a Forest-wide EIS first, the Forest Service can not know that the proposed East Side Project will not have a great impact on Indiana bat populations.

The FWS concluded that implementation of the Forest Plan and the projects predicated upon it will not jeopardize the continued existence of the Indiana bat (BO p. 61). The FWS has also concurred with the Forest Plan Amendment EIS, for the preferred alternative (Alternative 1) (FWS memo dated 7/20/2000).

Comment 129-239

45. In his comments on the Draft Indiana Bat Recovery Plan, Scott Pruit, the Acting Field Supervisor for USF&WS in Bloomington, Indiana, noted that a lot of the research to date suggests that Indiana bats have a preference for less fragmented forest habitats:

> Much research of which we are aware suggests that Indiana bats often occupy the least fragmented forest left available to them. The purported preference for open canopies also appears not to be supported by available data. Specific examples follow:
>
> 1) On Jefferson Proving Ground (JPG), in southern Indiana, research on the Indiana bat population has been ongoing since 1993. This 5 1,000 ac closed Army base in estimated to be 80% forested. The property includes a

Comment 129-239 cont.

10,000 ac block of mature, unfragmented hardwood forest; this is one of the largest unfragmented forest blocks in the lower Midwest. JPG is surrounded by a landscape dominated by agriculture with fragmented forest patches. Researchers at JPG estimate that a minimum of 7 maternity colonies of Indiana bats occupy the property; this is among the highest known concentrations of Indiana bat maternity colonies in Indiana. While there are not adequate data to conclude that habitat at JPG is "preferred" by Indiana bats over more fragmented forest habitat, it seems a reasonable possibility given the high number of bats present in spite of the fact that JPG occurs within a larger landscape of fragmented forest. At the very least, this information from Indiana demonstrates that Indiana bats will utilize large blocks of forest when these are available to them.

One potential advantage of large forested blocks to Indiana bats may be lowered exposure to chemical contamination. The draft plan addresses the potential role of chemical contamination, particularly pesticides, in the decline of Indiana bats. Exposure to pesticides and other chemical contaminants will obviously vary depending on the habitat used by the bats. Indiana bats using large blocks of forest may have less exposure to chemicals than those in forests fragmented by agriculture, roads, and other developed areas. Information to evaluate chemical exposure in various habitats may not be currently available, but this issue may be worthy of investigation.

2) Callahan (1993) studied Indiana bat summer habitat requirements in northern Missouri. Based on his evaluation of 52 maternal roost trees in 4 maternity colonies in northern Missouri, he noted: "Most of the maternal roost trees selected by Indiana bats were snags in forest interior sites. Thirty-six of the 52 maternal roost trees were standing dead trees (snags) and over half (3 1) were located in the forest interior." Callahan's study was conducted in an area where there was considerable forest fragmentation, but he noted that Indiana bat maternity colonies tended to be located within the most heavily forested areas available to them and concluded "...that the preponderance of Indiana bat maternal colonies found in heavily forested areas suggests that large forest tracts are at least beneficial to Indiana bats." Callahan further noted the probable benefit of large forested tracks to Indiana bats from the standpoint of providing a long-term source of roost trees: "A large forest tract is more likely to include a variety of standing dead trees, increasing the probability that a suitable replacement snag will exist when a maternal roost tree becomes unsuitable...a relatively large number of potential maternal roost trees must be present to support the colony over the long term."

3) Based on their evaluation of summer distribution and habitat utilization of the Indiana bat in Illinois, Garner and Gardner (1992:page 1) concluded: "Deforestation for agriculture, surface strip-mining, road and utility construction, urban expansion and a host of other ?progress-' related developments all adversely affect the continued existence of M. sodalis throughout its range."

4) In their evaluation of summer roost selection and roosting behavior of the Indiana bat in Illinois, Gardner et al. (199 1 a) found 73 % of 44 maternity roosts in forested habitats were in areas with closed canopies (which they defined as over 80% canopy cover) and 27% in areas with 30-80% canopy cover. No roosts were found in areas with less than 30% canopy cover. They also found that floodplain forests with closed canopies were the preferred foraging habitat for pregnant or lactating female Indiana bats. These closed canopy forests were used disproportionately to their availability in the Illinois study area (Gardner et al. (1991b) .

5) Based on review of the available literature on Indiana bat summer habitat requirements, Romme et al. (1995:page 16) concluded that the Indiana bat "appears to show a distinct preference for floodplain and upland forested areas with relatively complete canopy closure." (available from the public record on the Indiana Bat Recovery Plan)

The commenter has misinterpreted Pruitt's statement on fragmentation. Pruitt refers to the agricultural landscape surrounding the Jefferson Proving Ground as fragmented. The ANF is not considered an agricultural landscape and early successional forested habitats should not be compared with agricultural fields when analyzing fragmentation because wildlife use is much different.

Neither herbicide used on the ANF has been shown to impact mammals (See Wildlife Risk Assessment in ANF Understory Vegetation Management FEIS Appendix C (1991).

Comment 129-240

`Z. Lake Sturgeon (Acipen serfulvescens)-

1. The lake sturgeon is a Pennsylvania state endangered species documented to occur along the Allegheny's portion of the Allegheny River (including post-1980 documented occurrences). This species is listed in Pennsylvania and Ohio as Endangered and in New York as Threatened. The Forest Service however has not performed any analysis on the impacts of East Side Project on this species. Furthermore, no surveys for the lake sturgeon were conducted before the analyses for the East Side Project was prepared. Finally, despite the continued listing of this species as endangered in Pennsylvania, no Management Plan (as required by Forest Plan Standards and Guidelines on page 4-37 of the Forest Plan) has been prepared. 2. One of the threats to lake sturgeon is sedimentation (Rooney 1994) and therefore the East Side Project analysis should give careful consideration to the impacts of logging and road construction on this species.

Comment 129-241 cont.

The commentor identifies 17 non-federally listed species not included on the ANF PETS species list, which he feels need to be considered due to state rankings, or vulnerability to potential impacts.

Risk assessments which looked at species vulnerability and were based on Forest and Regional occurrence, population status and trends, availability and distribution of suitable habitat and susceptibility to impacts, were conducted at the Regional level for these species, as well as other State listed species. These assessments incorporate the most current information available and based on the risk assessments completed, the 17 species identified by the commentor were either not included or were dropped from the Forests PETS species list. Uncommon species considered most vulnerable to management activities, as well as those species most likely to be affected due to the availability of suitable habitat and/or documented occurrence, were included on the ANF PETS species list. Effects to these species are addressed in the BA (Appendix C, pp. C-30 to C-39).

Although not included in the BA, anticipated effects to other wildlife species, including the 17 species listed by the commenter, as well as other State and Forest Species of special concern, are fully evaluated in the FEIS, Appendix C.

Comment 129-241

AA. Longhead Darter (Pereina macrocephala)-

1. The longhead darter is a state threatened darter known to inhabit the Allegheny. The Forest Service has not conducted surveys for this species required by the Forest Plan at Page 4-37. The Forest Service has not prepared management plans for this species as required by the Forest Plan at Page 4-37. These are violations of USC 1604 (i) and therefore the East Side Project Draft EIS should be rescinded and revised.

2. The longhead darter requires clean gravel and therefore is sensitive to siltation (Rooney 1994). This species has unfortunately been extirpated from Ohio. The impacts of the East Side Project on the longhead darter need to be carefully analyzed (Argent et al. 1998).

Impacts to the longhead darter are provided in the BA (Appendix C pp. C-39 and C-40).

Comment 129-242

BB. Longsolid (Fusconaia subrotunda)-

1. The Draft EIS fails to assess the impacts to the longsolid, a state threatened species recently proposed for the Allegheny's Sensitive Species List. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment.

Impacts to the Longsolid are presented in Appendix C (pp. C-38, C-40).

Comment 129-243

CC. Maine Snaketail (Ophiogomphus mainensis)

1. The Draft EIS fails to assess the impacts to the Maine snaketail, a state threatened species recently proposed for the Allegheny's Sensitive Species List. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment.

Impacts to the Maine snaketail are provided in Appendix C (pp.C-38,C-40, and C-43).

Comment 129-244

DD. Midland Clubtail (Gomphus ftaternus)-

1. The Draft EIS fails to assess the impacts to the midland clubtail, a state threatened species recently proposed for the Allegheny National Forest's Sensitive Species List. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment.

Impacts to the Midland Clubtail are provided in Appendix C (pp. C-38, C-40, and C-43).

Comment 129-245

EE. Mountain Brook Lamprey (Ichthyomyzon greeleyi)-

1. The mountain brook lamprey is a state threatened species in the Commonwealth of Pennsylvania. The species is listed as endangered in Ohio and has become extirpated from many northwestern Pennsylvania streams that it once inhabited (leading to its threatened status). This species however had not been documented in Pennsylvania streams until an apparent recent documentation made in the North Fork of Chapel Creek. The species has also been documented in Spring Creek in Forest County. The Forest Service has not conducted any surveys for is species in the East Side Project Area. Nor has the Forest Service prepared a management plan to ensure that the East Side Project is consistent with the demands of the mountain brook lamprey which includes protection of its habitat and water quality.

2. The Allegheny lies in the heart of this species two primary ranges (http://www.utexas.edu/depts/tnhc/.www/fish/maps/huggmaps/ichtgree.gif). Management must give this species special consideration.

Impacts to the Mountain Brook Lamprey are addressed in Appendix C (pp. C-39, C-40, and C-43).

Comment 129-246

FF. Mountain Madtorn (Noturus eleutherus)-

1. This species is listed as Endangered by the Commonwealth of Pennsylvania. It is known to occur within the Allegheny River Watershed at French Creek in Venango County. Portions of the Allegheny River watershed that are affected by the Allegheny would provide suitable habitat for this species but no surveys have been conducted to confirm or deny its presence. Because the Forest Service has not conducted any up to date Forestwide surveys for aquatic populations of imperiled species such as the mountain madtom these populations may in fact become extirpated before they are identified. This kind of damage is irreversible and a violation of the NFMA requirements to protect and provide for viable populations of all species. The East Side Project should not proceed before measures are taken to survey the Allegheny for the mountain madtom.

2. The mountain madtom is sensitive to ecological perturbations (Argent et al. 1998) and is therefore likely harmed by the East Side Project. The Forest Service must carefully consider the impacts of the proposed action on the mountain madtom.

See Comment 129-240.

Comment 129-247

GG. Moustached Clubtail (Gomphus adelphus)

1. The Draft EIS fails to assess the impacts to the moustached clubtail, a state threatened species recently proposed for the Allegheny's Sensitive Species List. Tionesta Creek is considered suitable unoccupied habitat for the moustached clubtail. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment along with a revised EA.

Impacts to the moustached clubtail are addressed in Appendix C (pp. C-38, C-40 and C-43).

Comment 129-248

HH. Northern Long-Eared Bat (Myotis Septentrionalis)-

1. The Forest Service has identified this sensitive species to occur on various parts of the Allegheny. However, the surveys to determine the use of the Allegheny by this species are still incomplete (and data analyses still haven't been completed), and Forest-wide measures to protect this species' habitat have not been developed. The East Side Project should not proceed until the 2-year bat survey is completed (including data analysis), the Forest Plan is amended to incorporate this species' changed status and habitat protections, and a conservation plan is developed for the northern long-eared bat as required by Forest Plan Standards and Guidelines (page 4-37).

2. Site 18 of Dr. Gannon's 1998 Survey for bats on the Allegheny was done in the Six Pipes Timber Sale Area. The area surrounding the survey was being logged at the time. This site resulted in the least number of bat calls of any of the sites. In fact, the second visit to the site resulted in zero detected calls. This suggests that logging is likely detrimental to localized bat activity during implementation. This site should be studied for post-implementation bat activity. In addition, the analysis for East Side Project must consider the impacts during logging activity on the northern long-eared bat.

Commentor has misinterpreted Dr. Gannon's results. Much variability exists in the number and diversity of bats sampled at any given survey location. Dr. Gannon's study was not designed to determine impacts of logging activities on bats.

Comment 129-249

II. Northern Madtom (Noturus stigmosus)

1. This species is listed as Endangered by the Commonwealth of Pennsylvania. It is known to occur within the Allegheny River Watershed at French Creek in Venango County. Portions of the Allegheny River watershed that are affected by the Allegheny would provide suitable habitat for this species but no surveys have been conducted to confirm or deny its presence. Because the Forest Service has not conducted any up to date Forestwide surveys for aquatic populations of imperiled species such as the northern madtom these populations may in fact become extirpated before they are identified. This kind of damage is irreversible and a violation of the NFMA requirements to protect and provide for viable populations of all species. The East Side Project should not proceed before measures are taken to survey the Allegheny for the northern madtom. [Note: A similar situation occurred with the Indiana and northern long-eared bats. Once surveys were conducted their presence was confirmed. If surveys were further delayed the Forest Service would not be conducting any analyses to guarantee their protection. As it is, the Forest Service is NOT taking the appropriate measures required by the BO from USF&WS for the Indiana bat. Surveys are essential for protecting and recovering Threatened and Endangered Wildlife.]

2. The northern madtorn has specific habitat (SIC) requirements (Argent et al 1998). The Forest Service should give the northern madtom special consideration before implementing any projects, including the East Side Project.

See Comment 129-240.

Comment 129-250

JJ. Northern Riffleshell Mussel (Epioblasma torulosa rangiana)-

1. The BO's "Reasonable and Prudent Measures" also set forth provisions for the northern riffleshell and clubshell mussels. These provisions also, according to the BO, include "current standards and guidelines found in the Forest Plan and amendments, and terms and conditions outlined in this opinion" (p. 70, emphasis added). Proceeding with environmental analysis on site specific actions when the programmatic analysis has not been amended to include significant environmental information, and the terms and conditions of the BO, constitutes arbitrary and capricious action and a violation of the NEPA, the NFMA, and the ESA.

2. The Forest Service has not incorporated the provision mandated by the terms and conditions of the BO into the East Side Draft EIS. Therefore the East Side Draft EIS does not comply with the NEPA, the NFMA, and the ESA requirements to prepare an adequate environmental analysis than ensures protection of viable populations and the recovery of threatened and endangered species.

3. The northern riffleshell mussel is harmed by sedimentation and siltation (Rooney 1994, USF&WS 1999). The Forest Service needs to more carefully consider the impacts of East Side Project on these endangered mussels.

4. The Draft EIS for the East Side Project completely ignores potential impacts to the northern niffleshell mussel. Despite the fact that these are critically imperiled species on the federal endangered species list and inhabit waters downstream of the East Side Project Area absolutely no analysis and NO effects determination is made! The Forest Service's failure to analyze the impacts of the East Side Project on the northern riffleshell mussel constitutes a violation of the NEPA, the NFMA, and the ESA. This is clearly arbitrary and capricious decision making.

5. What little discussion is given to the northern riffleshell mussel suggests that the East Side Project Area is not suitable habitat because of surveys done elsewhere in the Allegheny. The East Side Project Area has NOT been surveyed and this conclusion is clearly conclusory by nature (i.e. based on zero supporting evidence).

6. The United States Congress afforded Threatened and Endangered species the highest priority. The Forest Service, by failing to survey for these species in the East Side Project Area have violated the ESA.

7. "Fifty six of the 92 freshwater mussels native to the Mid-Atlantic Highlands Ecoregion are listed as endangered, threatened, or sensitive" (Rooney 1994). The Forest Service is furthering their endangerment by ignoring the impacts of the East Side Project on the endangered mussel. The Forest Service must develop an alternative that results in improved water quality. This alternative should include zero-logging, zero-road construction, and zero-herbicide use and it should also should emphasize preserving and enhancing water quality through re-stabilization of stream banks and the removal of sedimentation sources such as roads, clearcut areas, and log landing areas.

No clubshell or northern riffleshell mussels have been documented within the East Side project area. Surveys were completed in 1994 (Appendix C pp. C-12 and C-38).

Comment 129-251

K. Northern Water Shrew (Sorexpalustris)-

1. The Allegheny is home to this important species. Rooney notes that populations of this species tend to unfortunately be isolated, and therefore the loss of a single population could be permanent (Rooney 1994). This requires that the Forest Service give special consideration to the ability of this species to survive. It also brings to light the importance of surveys to locate populations before they are extirpated by the East Side Project proposed action.

2. Likewise, in their report on the shrew survey of the Allegheny, the Western Pennsylvania Conservancy describes their reasons for conducting the survey:

> Information about most small mammal populations within ANF is limited. Because both the long-tailed shrew and the water shrew are cryptic (secretive), but occupy habitats within forest settings that are rather specific and somewhat limited, timber harvesting activities have the potential to impact their populations. (Western PA Conservancy 1993: 2)

Potential impacts to the northern water shrew have been documented in Appendix C (pp. C-37, C-40, and C-43). Individual water shrews may be impacted but would not cause a trend toward federal listing.

Comment 129-252

LL. Ohio Lamprey (Ichthyomyzon bdellium)-

1. The Ohio lamprey is a state candidate species that needs to be considered in the East Side Project Draft EIS. Please note that all 3 prior state candidate species are now extirpated due to failure to protect their habitats.

1.The Allegheny is one of the Ohio lamprey's key habitats (http://www.utexas.edu/depts/tnhc/.www/fish/maps/huggmaps/ichtbdel.gif). The Forest Service should give special consideration to this species before implementing any of the East Side Project proposed action. In fact, the Forest Service should select No Action for the benefit of this and other PETS species.

See Comment 120-240.

Comment 129-253

MM. Rapids Clubtail (Gomphus quadricolor)-

1. The Draft EIS fails to assess the impacts to the rapids clubtail, a state threatened species recently proposed for the Allegheny's Sensitive Species List. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment.

Impacts to the Rapids clubtail are provided in Appendix C (pp. C-38, C-40, and C-43).

Comment 129-254

NN. River Redhorse (Moxostoma carinatum)-

1. The river redhorse is a state candidate species that needs to be considered in the East Side Draft EIS. Please note that all 3 prior state candidate species are now extirpated due to failure to protect their habitats.

See Comment 129-240.

Comment 129-255

00. Rough Cotton-Grass (Eriophorum tenellum)-

1. The Draft EIS fails to assess the impacts to the rough cotton-grass, a state threatened species recently proposed for the Allegheny's Sensitive Species List. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment.

Impacts to Rough Cottongrass are provided in Appendix C (pp. C-39, C-40, and C-43).

Comment 129-256

OO. Ski-tailed Emerald (Somatochlora elongata)-

1. The Draft EIS fails to assess the impacts to the ski-tailed emerald, a state threatened species recently proposed for the Allegheny's Sensitive Species List. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment.

2. This species has been confirmed to inhabit Sugar Run (juvenile), Tionesta Creek, and East Branch of Tionesta Creek (Bier et al. 1997). The East Side Project analysis must consider impacts to this species and its habitat.

Impacts to the Ski-tailed Emerald are provided in Appendix C (pp. C-38, C-40, and C-43).

Comment 129-257

PP. Small Whorled Pogonia (Isotria medeoloides)-

1. The surveys conducted for small whorled pogonia within the East Side Project Area are antiquated because they are based on out of date survey protocol. The Forest Service must survey the East Side Project area using newer up to date protocols.

2. The DCNR has said that the small whorled pogonia is affected by habitat alteration and requires mature forests. The East Side Project would harm the small whorled pogonia by destroying thousands of acres of potential habitat.

3. Threats to the small-whorled pogonia include even-aged logging (Rooney 1994). The East Side Project is focused on the implementation on even-aged logging. In fact, the East Side Project calls for nearly one thousand acres of removal cuts - the most harmful to small whorled pogonia habitat. Rooney (1994) states that removal cuts can lead to reproductive failure for this endangered species.

4. The East Side Project must incorporate mitigation measures that help avoid soil compaction and trampling - both of which cause habitat degradation (Rooney 1994).

5. Despite the fact that the East Side Project Area includes suitable habitat for the small whorled pogonia and that the East Side Project proposed action is primarily removal cuts, which are known to cause habitat loss for the small whorled pogonia, the Draft EIS for the East Side Project arbitrarily concludes that "No impacts from any of the alternatives are anticipated." In fact, the Draft EIS does not make any mention of how the proposed actions may or may not impact the small whorled pogonia. The conclusion that there will be "No impacts" is a conclusory statement and constitutes arbitrary and capricious action and a violation of the NEPA and the ESA.

6. The Cumulative Effects analysis further concludes that the small whorled pogonia will not be impacted because none have been found - a contradiction to the fact that the Forest Service has conducted zero surveys for the species this past season. Survey protocol for this species has changed since the original surveys were conducted years ago, making those original surveys virtually useless in terms of successfully identifying the presence or absence of the species. Furthermore, the small whorled pogonia is known to be dormant for years suggesting the need for multiple year surveys on proposed sites.

7. The Forest Service has acted arbitrarily and capriciously and has violated the NEPA and the NFMA by stating that there would be no cumulative or direct effects to the small whorled pogonia. East Side Project Area contains suitable habitat for the small whorled pogonia. The East Side Project proposes massive amounts evenaged cutting, an action which will make this habitat unsuitable for this endangered species.

Since 1987 the ANF has competed small-whorled pogonia surveys on more than 227,000 acres and none have been found (Appendix C p. C-14). No impacts are anticipated from any alternative (Appendix C p. C-39).

Comment 129-258

QQ. Southern Redbelly Dace (Phoxinus erythrogaster)-

1. The Draft EIS for the East Side Project fails to assess the impacts to the Southern redbelly dace, a state listed threatened species whose most recent documented occurrences in Pennsylvania are in Warren County. The Forest Service has not conducted surveys within the East Side Project Area to determine whether or not the species is present. The surveys which are required by Standards and Guidelines in the Forest Plan for the Allegheny are necessary for determining mitigation measures and conservation actions are also required by Standards and Guidelines on Page 4-37 of the Forest Plan.

See Comment 129-240.

Comment 129-259

RR. Spotted Darter (Etheostoma maculatum)-

1. The spotted darter is a state threatened darter known to inhabit the Allegheny. The Forest Service has not conducted surveys for this species required by the Forest Plan at Page 4-37. The Forest Service has not prepared management plans for this species as required by the Forest Plan at Page 4-37. These are violations of USC 1604 (i) and therefore the East Side Draft EIS should be rescinded and revised.

2. The spotted darter is sensitive to sedimentation and siltation because of how they effect the availability of large, loose, and rough substrates this species needs (Argent et al. 1998 , Rooney 1994). The Forest Service should give this species special consideration by analyzing the impacts of the proposed East Side Project on the spotted darter.

Impacts to the spotted darter are addressed in Appendix C (pp. C-39,C-40 and C-43).

Comment 129-250

SS. Thread Rush (Juncus filiformis)-

1. The Draft EIS fails to adequately assess the impacts to the thread rush, a state threatened species recently proposed for the Allegheny's Sensitive Species List. The East Side Project can not proceed until the Draft EIS is again revised and distributed for public comment.

Impacts to the Thread Rush are provided in Appendix C (pp. C-39,C-40, and C-43).

Comment 129-261

TT. Tippecanoe Darter (Etheostoma tippecanoe)-

1. The tippecanoe darter is a state threatened darter known to inhabit the Allegheny. The Forest Service has not conducted surveys for this species required by the Forest Plan at Page 4-37. The Forest Service has not prepared management plans for this species as required by the Forest Plan at Page 4-37. These are violations of USC 1604 (i) and therefore the East Side Draft EIS should be rescinded and revised.

2. The tippecanoe darter requires clean gravel and is therefore sensitive to siltation and habitat degradation (Argent et al. 1998). Rooney also notes that this species is sensitive to sedimentation (1994). The Forest Service should develop an alternative that provides for less habitat degradation for this species. The Forest Service must carefully analyze the impacts of the proposed East Side Project action on the tippecanoe darter.

Impacts to the Tippecanoe darter are provided in Appendix C (pp. C-39, C-40 and C-43).

Comment 129-262

UU. Timber Rattlesnake (Crotalus horridus)-

1. The Timber Rattlesnake is a state threatened species. The Forest Service needs to develop a management plan for the Timber Rattlesnake. It is impossible to make informed project by project analyses of impacts to the Timber rattlesnake without a broader management plan on which to base these analyses. These Management plans help keep the Forest Service from acting in the dark.

There is a wealth of information on the habitat needs of the Timber rattlesnake. There is sufficient information to develop a forest wide management plan. The Forest Service needs to either incorporate the Timber rattlesnake into the current ongoing Forest Plan Amendment, as required by law, or immediately initiate a new process for developing management plans for the Timber rattlesnake and all other state threatened and endangered species. The latter process would need to be initiated through a Notice of Intent followed by a Draft EIS.

See appendix C, pp. C-2 and C-30 for discussions concerning the timber rattlesnake. Conservation Assessments and Strategies for all sensitive species will be completed as data is collected and funding permits. Several conservation assessments for sensitive species are currently being undertaken. Also, see Comments 129-146, 129-151, 129-162, 129-163, and 129-166.

Comment 129-263

2.Proper management for the Timber rattlesnake requires an understanding of what habitat it is using on the Allegheny National Forest and what habitat it may not be using on the Allegheny. The list of potential and known denning sites on page C-26 can be looked at to get an idea of what types of habitat the Timber rattlesnake is using on the Allegheny:

C-854, S-35: This Allegheny Hardwoods stand is 16 acres in size and 87 years old. The healthy relative density is 36%. It lies in the Wolf Run drainage near, but west of the Mill Creek loop trail. 6 acres are considered visually sensitive (though it is not clear why since neither the EIS nor the Project File indicates why). This area is proposed for a shelterwood clearcut.

C-70 1, S-17: 10 acre red pine stand that is 61 years old. The stand has a very high relative density of 112%. It is proposed for a thinning cut.

C-701, S-22: 71 acre red pine stand that is 61 years old. The stand has a very high relative density of 103%. It is proposed for a thinning cut.

C-684, S-1 1: 30 acre red pine stand that is 64 years old. The stand has a very high relative density of 95%. It is proposed for a thinning cut.

C-684, S- 14: 26 acre red pine stand that is 61 years old. The stand has a very high relative density of 99%. It is proposed for a thinning cut.

C-700, S-89: There is no information on this stand in the EIS. The maps do not even indicate where it is. It could be a site where road construction will take place but it is unclear.

C-712, S-19: This is a 24acre Allegheny Hardwood stand that is 90 years old with a 75% relative density. It is proposed for a selection cut.

Comment 129-263 cont.

A complete analysis of the Timber rattlesnake's habitat would require a review of only occupied sites and would need to consider sites outside of the East Side Project Area (as well as sites where activities are not proposed within the East Side Project Area). Until such a habitat is complete, however, this is the best we can do. Nevertheless, it appears that Timber rattlesnakes prefer denning sites under large boulders in older forests with open understories. It is not clear, based on this information, how logging could be performed without harming the snakes habitat. Since the Timber rattlesnakes do not appear to occupy denning sites in open, early-successional stands, the proposed shelterwood clearcut is very likely to have negative impacts to the Timber rattlesnake.

Much additional information is needed on the identification of occupied den sites for Timber rattlesnakes before a comprehensive Conservation Assessment and Strategy can be developed. Large boulders and rock outcrops that represent potential habitat are being protected. Potential impacts to timber rattlesnakes are addressed on page C-30 of the Appendix C.

Comment 129-264

. We have sent in a Freedom of Information Act request under separate cover for Shaffer 1991 which is cited in the BA

Shaffer 1991 is a 161 page book on Reptiles and Amphibians in Pennsylvania and is available at most libraries.

Comment 129-265

4. The East Side BA indicates that "Maintaining the integrity of these den sites is the primary habitat management action for sustaining rattlesnake populations on the ANF." When was this management strategy developed?

5. Who developed the above Management strategy for the timber rattlesnake?

This is a habitat management action or mitigation measure based on current timber rattlesnake literature. A comprehensive Conservation Strategy will be developed in the future with appropriate NEPA documentation.

Comment 129-266

6. The Forest Service can not arbitrarily develop management strategies without t following the proper procedures. The NEPA requires that programs to be funded, overseen, or decided upon by the Forest Service be documented in an environmental analysis which is released to the public for comment. It appears that the Forest Service is developing management strategies without including the public.

See Comment 129-265. A comprehensive management strategy has not yet been developed. The Forest Plan directs the protection of specific key habitats and specialized habitats through coordination with other resource management activities or area closures (Forest Plan p. 4-37).

Comment 129-266

7. What is the home range of the Timber rattlesnake? This is obviously important for conserving this species and adequately determining the effects to the snake. Research suggests that males can disperse as far as 2 to 7 kilometers from the den during the summer months, with females staying closer to the den. A proper management plan for the Timber rattlesnake would incorporate information on the range of the females (would logging in adjacent stands during the summer months endanger females?), information on what habitats are used by males and females during the summer months (a proper analysis would involve mitigations against cutting within certain distances in likely summer habitat points), as well as potentially tracking dispersal patterns and implementing mitigations to protect these.

We are still gathering data on timber rattlesnakes on the ANF. More information is needed before a conservation assessment and strategy can be developed.

Comment 129-268

8. Since Timber rattlesnakes return to the same dens from year to year it is very important that those habitats not be impacted in any fashion. This makes for easy habitat management.

We agree that den sites should be protected. See appendix D, p. D-4, and mitigation measure WL15.

Comment 129-269

9. The management strategy of maintaining integrity of denning sites should obviously include maintenance of the forested habitat within which the dens are located. It seems both silly and absurd not to protect the integrity of these sites. Especially since, as the 1998 Monitoring report indicates, "second growth forests on hillsides with a southern exposure and rock outcrops is preferred habitat (Shaffer, 19991)." Based on this, the determination that East Side "may impact individuals" is wrong. The factual evidence suggests that since the East Side project proposes logging, including a clearcut, within known/potential denning areas that it is likely that local populations may be affected and not just individuals.

In order to avoid potential impacts to rattlesnakes, seven stands are proposed for seasonal logging while rattlesnakes are in their dens (Appendix C p. C-30). Also, a Wildlife Biologist will delineate a line around boulder areas in these stands to protect the integrity of the denning sites. See Appendix D, Mitigation Measures (pp. D-5 and D-6).

Comment 129-270

10. Rattlesnakes emerge in late April or early May and enter hibernation in mid to late October (Genoways and Brenner 1985). Given this, the suggested seasonal restriction of April 1st to August 3 1st is insufficient. No logging should occur within these stands between April I 0th and October 3 Ist. A decision that compromises local populations of Timber rattlesnakes by allowing logging during September and October would be arbitrary and capricious and a violation of NFMA requirements. This is especially true since the breeding season runs through early October (Genoways and Brenner 1985).

For the seven stands discussed in Comment 129-269, no skidding or logging will be allowed between September 1st and April 1st. See Appendix C p. C-30 and Appendix D.

Comment 129-271

11. The proposed mitigation for Timber rattlesnakes is insufficient. Besides the problems with the seasonal restrictions, the proposed buffer is insufficient on two counts.

A) First of all, the mitigation fails to restrict logging within the buffer area. Logging could have numerous impacts to den conditions, not to mention surface conditions. Changes in canopy cover could severely alter exposure of the denning sites to solar radiation, atmospheric deposition, and ecosystem types. This could, in turn, alter den conditions resulting in harm or mortality to snakes. Active logging could also cause physical vibrations and disturb hibernating populations. Populations could be harmed and lose viability. Alteration of surface habitat could also effect summer hunting and breeding. When the snakes leave the denning sites in the spring they could find their habitat dramatically altered. The result could be greater susceptibility (SIC) to predators and a drastic change in their ability to hunt. Open canopies, especially those created by shelterwood removal cuts, would likely cause local populations to lose viability.

B) Secondly, the mitigation falls to identify the buffer size. The buffer size should be based on the home range of the female Timber rattlesnakes. The buffer should extend 1/3 of the distance beyond their home range. It is important to identify the size of the buffer in order to properly determine the effects. The effects would vary greatly if 25', 100', or 3 00' buffers were applied. A properly prepared forest wide Management plan would help guide these types of site-specific decisions, allowing decision makers to apply appropriate buffers in appropriate circumstances. Without a Management plan there is no way of properly determining the effects.

In order to appropriately protect Timber rattlesnakes, the Forest Service needs to adopt a buffer zone that restricts logging, road construction, herbicide application, motorized trail construction, and so forth. The buffer zone should be equal to the size of the home-range (plus 1/3 of the home-range) of female Timber rattlesnakes. And remember, that additional mitigations that involve seasonal restrictions on cutting in potentially occupied stands (and potentially neighboring stands) as well as mitigations for males in the summer months are essential to maintaining viable populations of this species.

Comment noted. We believe that the mitigation measures that we have proposed; protection of denning sites and seasonal logging restrictions in seven stands is sufficient to protect the timber rattlesnake on the ANF.

Comment 129-272

12. Timber rattlesnakes have mature slowly and have limited reproductive capabilities (they reproduce once every two or three years). Given this, it is important that all individuals be protected, since the loss of a couple of individuals could seriously effect the viability of local populations.

13. Given the limited number of populations on the Allegheny National Forest, if one or two populations are lost due to proposed management activities (through either alteration of habitat or direct mortality) it is also likely that species viability could be lost. The analysis on the Timber rattlesnake need to be revisited.

Comment noted. All available information on timber rattlesnakes on the ANF was used in the analysis. We believe the analysis is sufficient and will protect existing populations.

Comment 129-273

VV. Uhler's Sundragon (Helocrodulia uhlert)-

1. The Draft EIS fails to adequately assess the impacts to the Uhler's sundragon, a state threatened species recently proposed for the Allegheny's Sensitive Species List. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment.

2. Surveys confirmed the presence of this species at the mouth of Kinzua Creek (Bier et al. 1997). Many potential habitats have not yet been surveyed. Surveys and analysis on potential impacts to this species have yet to be completed.

Impacts to Uhler's Sundragon are provided in Appendix C (pp. C-38, C-40, and C-43).

Comment 129-274

XX. Wiegands Sedge (Carex Wiegandii)-

1. The Wiegands sedge is a Allegheny sensitive species. The Wiegands sedge occurs in sphagnum, openings in swamps and suitable habitat occurs within the East Side Project Area. Habitat alteration is considered detrimental to the survival and recovery of this species (Rooney 1994). Despite this, the Forest Service has not surveyed the East Side Project Area for the Wiegands sedge. Nor has the Forest Service incorporated any mitigation measures that will specifically protect this species or any actions to benefit this species.

2. The Wiegands sedge is known to inhabit both Elk and McKean Counties according to the Forest Service. It is therefore likely to inhabit the Allegheny. The Forest Service clearly needs to conduct Forest-wide surveys for this species, prepare a Forest-wide EIS documenting the impacts of management actions on the Wiegands sedge, amend the Forest Plan to incorporate protection and recovery measures for the Weigands sedge, and then conduct surveys within the East Side Project Area all before continuing with any environmental analysis on the impacts of the East Side proposed action on the Weigand's sedge. Until these measures are completed any attempts at continuing with the implementation of the East Side Project is arbitrary and capricious, and violates federal law.

Surveys of the highest potential habitat were completed by the Western Pennsylvania Conservancy in 1989 and 90 and none were found within the project area (Appendix C p. C-14). Impacts to Weigand's sedge are provided on page C-39, C-40, and C-43.

Comment 129-275

YY. Yellow-bellied Flycatcher (Empidonnaxflaviventris)

-1. The Draft EIS fails to adequately assess the impacts to the yellow-bellied flycatcher, a state threatened species recently proposed for the Allegheny's Sensitive Species List. The yellow-bellied flycatcher is known to nest in the unsalvaged tornado swath of the Tionesta old-growth, a mere 4 miles to the east of the East Side Project Area. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment.

The yellowbellied flycatcher analysis is sufficient. None of the alternatives propose timber harvest, road building or surface disturbing activities in this flycatcher's habitat (Appendix C p. C-32).

Comment 129-276

2. The DCNR states that "One of the state's rarest nesting species, this flycatcher can survive only if shrubby wetlands and conifer stands in extensive upland forests are preserved." The Forest Service needs to implement measures to protect this state threatened species.

Comment noted. See Comment 129-275.

Comment 129-277

3. The yellow-bellied flycatcher is dependent on older hemlock forests and is sensitive to habitat alteration due to logging (Rooney 1994). The Forest Service can not assume that because this species is "extremely rare" on the Allegheny, that therefore there will be no harm done through execution of the East Side Project. The Forest Service should develop an alternative that includes zero-logging as part of the East Side Project analysis for the purposes of protecting yellow-bellied flycatcher habitat.

Yellow-bellied flycatchers are nesting on the ANF in the 1985 tornado swath where virtually all of the trees were blown down, a habitat with many characteristics similar to timber harvest. No impacts to existing yellow-bellied flycatcher habitat are anticipated (Appendix C p. C-32).

Comment 129-278

4. The East Side BA states on page C-4 that:

> In Pennsylvania it nests in mossy, poorly drained areas in extensive sections of northern hardwood forests. On the ANF [the yellow-bellied flycatcher] has been documented nesting in an unsalvaged portion of the 1985 tornado swath (D. Gross, pers. comm.).
> This nesting site is within the East Side project area but is more than a mile from the closest treatment area. Unlike other flycatchers, the Yellow-bellied flycatchers nests on the ground usually concealed in sphagnurn moss. The home range of this rare flycatcher is between on and ten acres (DeGraff et al, 1992.)

There appears to be an erroneous analysis here. The Forest Service seems to be implying that despite the fact that this species requires large tracts of northern hardwood forests, the fact that its home size is only 10 acres will ensure that it is protected. There is good reason for the fact that the only place on the Allegheny National Forest that this bird chose to nest was in an unsalvaged tornado area in the region's largest tract of mostly unfragmented old growth, Tionesta Scenic and Research Natural Areas. The Forest Service must develop a Management Plan for this species that provides not only habitat for the existing nest but develops goals and objectives for this species forest-wide. This will prevent this type of arbitrary conclusion on page C-4:

> Habitat management for this species on the ANF focuses on maintaining suitable wet areas with sphagnurn moss.

Protecting only nesting sites, and not the necessary large tracts of older growth forests is entirely an arbitrary and capricious measure. Detennining what the forest-wide management strategy for the Yellowbellied flycatcher is beyond the scope of the East Side EIS. The failure to complete the mandated Management Plan violates the NFMA. Any management plan for this flycatcher would have to address existing and potential populations. This is especially important since the isolated populations of this species in PA are particularly at risk.

All alternatives result in extensive northern hardwood forests. The commenter has assumed that extensive northern hardwood forests equates to larger tracts of older growth forests which may not be the case. There are no treatments planned under any alternative in the wet sphagnum nesting habitat of this species. The Conservation Assessment for this species is in progress.

Comment 129-279

5. The East Side BA states that "The Pennsylvania Breeding Bird Atlas project confirmed this species in only two survey (SIC) blocks (Brauning, 1992.)" It is important to distinguish that these two plots do not include the population in the Tionesta areas. It is also important to note that maintenance of viable populations in PA and on the Allegheny requires that habitat be maintained to ensure greater numbers of flycatchers nest here.

Comment noted. All alternatives maintain habitat for this species.

Comment 129-280

6. The effects conclusion for the Yellow-bellied flycatcher is entirely arbitrary and capricious and ignores the relationship between the flycatcher and its habitat which is described as requiring large tracts of contiguous forest. Proposed logging, especially in cumulation with other proposed projects such as Eagle mills, Six pipes, Brookston, and Pigeon will further isolate the existing nesting location through fragmentation of nearly all of the surrounding forest lands. The effects determination on page C-27 reads:

> Although the only known location of the yellow-bellied flycatcher on the ANF is within the project area, no treatments under any of the alternatives are near this known site. Thisknown nesting location is within the 1985 tornado swath, characterized by dense saplings, and large woody debris with sphagnum moss on the forest floor. None of the alternatives propose timber harvest, road building or surface disturbing activities in this type of habitat. Therefore, the yellow-bellied flycatcher would not be impacted under any alternative.

Comment 129-280 cont.

This conclusion ignores every piece of information about the yellow-bellied flycatcher. First of all, this species prefers old growth forest conditions. Yet the proposed action would reduce the amount of old growth forest to less than the Desired Future Condition outlined in the Forest Plan for MA 3.0 and MA 6. 1. Secondly, this species likes to nest amongst blowdowns (Rooney 1994.) Yet, part of the East Side proposal is to salvage log blowdown just southwest of the Tionesta areas. The Forest Service needs to protect windthrow areas and large sections of surrounding forest. An analysis needs to be done to look at impacts to potential nesting sites and their surrounding habitats. Until these things are adequately done, this conclusion is entirely arbitrary and capricious.

The commenter has assumed that extensive hardwood forest means large tracts of contiguous forests. We have not documented the yellowbellied flycatcher in any other habitats on the ANF other than the wet sphagnum/sapling habitat.

Comment 129-281

7. Apparently the Forest Service has initiated a Management plan for the yellow-bellied flycatcher. Yet, it has not been incorporated into the ongoing Forest Plan amendment analysis due to an illegal fragmentation of the issues by the Forest Service. What is the status of this Management Plan? When will the Notice of Intent be issued?

The Conservation Assessment for the Yellow-bellied flycatcher is in progress and is expected to be completed this fall.

Comment 129-282

ZZ. Zebra Clubtail (Stylurus seudderi)

1.The Draft EIS fails to assess the impacts to the zebra clubtail, a state threatened species recently proposed for the Allegheny's Sensitive Species List. The East Side Project cannot proceed until the Draft EIS is again revised and distributed for public comment.

2.The zebra clubtail, formerly known as the scudder's clubtail, is known to inhabit the Allegheny. It is known to inhabit the East Branch of Tionesta Creek, Kinzua Creek, Salmon Creek, South Branch of Tionesta Creek, and Tionesta Creek. This species clearly is one of importance on the Allegheny. The Forest Service, however, has not surveyed for this species within or near the East Side Project Area.

3.Threats to the zebra clubtail include deterioration of water quality (Rooney 1994). The East Side Project threatens the viability of this species. The Forest Service needs to develop a zero-logging alternative for the benefit of species requiring high water quality. Until this is done, the Forest Service should select the No Action alternative.

4. The project file indicates that the scudder's clubtail (a.k.a. zebra clubtail) was removed from the Allegheny sensitive species list in 1996 because it only had a G3/G4 ranking. However, the scudder's clubtail has throughout had a S I ranking suggesting the need to maintain it on the Allegheny sensitive species list. The species was confirmed to live on 5 locations on the Allegheny in 1998 - however, no analysis has been given to this species since. The removal of this species from the Allegheny's sensitive species list clearly constitutes arbitrary and capricious action on behalf of the Forest Service and a violation of the NFMA.

Impacts to the zebra clubtail are included in Appendix C pp. C-38, C-40, and C-43.

Comment 129-283

1. In 1986, the Forest Service approved the Forest Plan for the Allegheny. This Plan included a Standard and Guideline (Standards and Guidelines are requirements that the Forest Service must comply with under the NFMA that required the preparation of Management Plans for all state and federally listed Threatened and Endangered Species that occur on the Allegheny or in its watersheds (Page 4-37 of the Forest Plan). Since 1986, the Forest Service has approved dozens of timber sales on the Allegheny resulting in 84,463 acres of even-aged logging, 6,206 acres of un-even aged logging, 14,193 acres of herbicide spray, and 847.3 miles of road construction and re-construction. On the other hand, the Forest Service has prepared NO management plans for threatened and endangered species. The extreme bias towards timber production by the Forest Service is clear. The Forest Plan additionally included a Standard and Guideline requirement that surveys be conducted for threatened and endangered species in "all areas to be affected by land adjustment or resource management activities" (Forest Plan page 4-37) The Forest Service has conducted the required surveys for only one species, the federally endangered small whorled pogonia, in conjunction with resource management activities. Surveys have not been conducted for any other state and federally threatened and endangered species. In addition to the failure to survey for most of these species, many of the surveys for the small whorled pogonia were conducted under outdated protocol and the Forest Service has conducted no new surveys before preparing the East Side Project.

Comment 129-283 cont.

Conservation assessments for sensitive species are underway, but to date, none have been completed. Survey work for PETS species conducted within the project area, as well as in suitable habitat across the Forest is described on pp. C-4 through C-16 of the BA in Appendix C. Although the commenter suggests that only the small-whorled pogonia has been surveyed for, as described in the BA, the project area has been surveyed for the Indiana bat, Northern Long-eared bat, Eastern small-footed myotis, northern water shrew, Long-solid mussel, harpoon clubtail, midland clubtail, ski-tailed emerald, Maine snaketail, zebra clubtail, rapids clubtail, mustached clubtail, Uhlers sundragon and small-whorled pogonia. Additionally, the survey protocol utilized for the small-whorled pogonia, was agreed upon with the USFWS.

The need for project level field reconnaissance is commensurate with the risks associated with the project, the species involved, the likelihood of species occurrence and the level of knowledge already at hand. Information presented in the FEIS is based upon this survey work Additionally, all alternatives comply with the terms and conditions set forth in the BO.

Also, see Comments 129-146, 129-151, 129-156, 129-162, and 129-171.

Comment 129-284

2. The federally endangered clubshell mussel and northern riffleshell mussel, the Pennsylvania endangered black bullhead, burbot, eastern sand darter, lake sturgeon, mountain madtom, northern madtom, the Pennsylvania threatened bigmouth shiner, bluebreast darter, channel darter, gilt darter, gravel chub (also proposed for the Allegheny's sensitive species list), harpoon clubtail, longhead darter, longsolid (also proposed for the Allegheny's sensitive species list), Maine snaketail, midland clubtail (also proposed for the Allegheny's sensitive species list), mountain brook lamprey (also an Allegheny sensitive species), moustached clubtail, rapids clubtail, southern redbelly dace, tippecanoe darter, Uhler's sundragon, and zebra clubtail, American brook lamprey, brook stickleback, horneyhead chub, Ohio lamprey, river redhorse, northern water shrew, and the proposed for TES status green-faced clubtail ALL require excellent water quality for the maintenance of viable populations. Many species on the Allegheny that are not considered PETS species also require excellent water quality. The East Side Project, alone and in cumulation (SIC) with other currently proposed actions, calls for enormous amounts of c1removal" clearcutting, herbicide spraying, road construction, and other actions that will all negatively impact water quality through the displacement of sedimentation, siltation, and pollution into the waters that provide habitat for these PETS species. Despite this, the Forest Service has not considered an alternative for the East Side Project that would improve water quality (only alternatives that mitigate against proposed negative impacts). The Forest Service hasn't even considered the NEPA and NFMA mandated un-even aged alternative that, though causing negative impacts on water quality, would result in less negative impact than any of the proposed actions (excluding No Action). The Forest Service MUST also develop this alternative: a zero-logging, zero-herbicide, zero-road construction alternative that utilizes restoration of streambanks (through planting), removal/revegetation of sediment sources (such as roads, poor campsites, and log landings), and the restoration of previously clearcut forestland through the planting of native species such as hemlock and white pine (no black cherry should be planted anywhere on the Allegheny ever again).

Impacts to water quality and impacts of road construction are addressed on pages 83 through 105. Neither water quality degradation nor road construction would be severe enough to impact TES species (Appendix C pp. C-42 & C-43). Also, see the Alternatives Considered but Eliminated from Detailed Study section of Chapter 2.

Comment 129-285

A.Salmon Creek and Little Salmon Creek Watersheds-1. No Cutting, Herbicide Spraying, or Road Building should be allowed in the Salmon Creek or Little Salmon Creek Watersheds.

Comment noted. See the Purpose and Need section of Chapter 1.

Comment 129-286

2. East Side proposes cuts in the Salmon Creek and Little Salmon Creek watersheds here as well as their unnamed tributaries and a number of seeps and springs. The impacts of sediment needs to be analyzed for ALL of these watersheds. Not just sediment from roads but sediment from all proposed activities.

Sediment production from surface water flow is very low. Cross-soil surface water flow generally only occurs on slopes over 50 percent. Nine years of monitoring has yielded only 0.2 percent observable erosion on harvest units. Filter strips are effective in stopping any sediment that may occur before they reach streams. See Chapter 3, Water and Watershed section, p. 83-86.

Comment 129-287

3. East Side calls for at least 304 acres of cutting that will disturb soils within the Little Salmon Creek Watershed, This will result in large amounts of sediment being poured into this beautiful watershed. Drop these cuts from your proposal.

Comment noted. See Comment 129-286.

Comment 129-288

4. In addition to the 304 acres of cuts proposed by East Side there are areas currently being logged there. Consider these in your cumulative effects analysis.

Comment noted. See the Cumulative Effects for Ecological Landtypes and Water sections.

Comment 129-289

5. Please send us copies of the Final Environmental Assessments and Decision Notices for areas currently being cut in the Salmon Creek and Little Salmon Creek Watersheds (except for Greely Farm Re-entry which we already have).

There is some harvesting from the Beaver Dam and Mother Nature EAs in the vicinity of these watersheds. There is potential activity from the FR 165 and Coon Creek EAs also. Our records indicate that you have copies of all of these documents.

Comment 129-290

6. The Ritt's Salvage includes cuts off or FR 216A. These are neither part of Mortality 11 nor East Side. Please provide the Environmental Analysis and Decision Notice for the Project(s) that approved these cuts.

There are no proposed harvest units off of FR 216A in the East Side project or are there any planned at this time in any other projects.

Comment 129-291

7. There is some nice flora along Little Salmon Creek. Protect this flora.

Comment noted. See Appendix D, Mitigation Measures.

Comment 129-292

8. The proposed cuts in the Salmon Creek/Little Salmon Creek watersheds will create 5 cuts greater than 40 acres. According to your figures in the Mortality 11 EA only 2 greater than 40 acre cuts were created (Mortality 11 EA, p.28). The Mortality 11 EA identifies these cuts as being 159 acres and 47 acres in size respectively while more detailed study shows that they should be 179 acres and 95 acres in size respectively. Since stands C-41 Stand-87 and C-40 Stand-3 were dropped they now equate to 169 acres and (dropped) respectively.

We reviewed your 'Greater than 40 Acre Cut Analysis' (Attachment 6) submitted with your comments on the East Side project. Your attachment includes outdated information. You have listed stands that are not included in East Side treatments and/or identify incorrect treatments. Also, your analysis uses a different set of assumptions. We do not use 20 years as the standard for inclusion in temporary opening calculations. Our standard for assessing temporary opening block size was as follows:

- **Identify East Side treatments where temporary openings will be created through clearcut, shelterwood removal, or shelterwood seed followed by shelterwood removal.**

Comment 129-292 cont.

- **Identify existing and planned temporary openings. Include stands that are less than 14 years old (stands equal to or greater than 14 years old are tall enough to no longer be considered a temporary opening, based on observations made in regenerating stands on the ANF). Also, see Appendix B, p. B-20.**
- **Calculate size of temporary opening. Consider when the Eastside treatment will occur (i.e. – now or in 2008) in calculation of temporary opening size.**

Area 1 – We show this as Block 2 on East Side Appendix B, Table 19, however we find this block to be 153 acres, not 179 acres. Your table includes incorrect stand acres for six stands, and does not include treatments proposed for Comp 642 stand 29. Comp. 641 stand 87 was not included as an East Side treatment.

Area 2 – This block is less than 40 acres. Your table includes incorrect stand acres for three stands. Comp. 641 stand 93 was not included as an East Side treatment.

Area 3 – This block is less than 40 acres. Your table includes incorrect stand acres for one stand.

Area 4 – This block was not evaluated in East Side. Comp 640 stand 3 (originally proposed in Mortality II) was not included as an East Side treatment.

Area 5 – This block was not evaluated in East Side. Comp 640 stands 20 and 46 (originally proposed in Mortality II) were not included as East Side treatments.

Comment 129-293

9. Refer to Attachment 6. Attachment 6 is the greater than 40 acre cuts analysis from Mortality 11. In your EA you identified 24 greater than 40 acre clearcuts where there actually were 32. Additionally, most of those you identified were actually larger than you credited. This shows how pathetically careless your analysis was. The analysis for East Side MUST be much more sophisticated and reliable.

We reviewed your 'Greater than 40 Acre Cut Analysis' (Attachment 6) from the Mortality II project file. We do not agree with your analysis. Your attachment includes outdated information. You have listed stands that are not included in East Side treatments and/or identify incorrect treatments. We do not use 20 years as the standard for inclusion in temporary opening calculations. Our standard for assessing temporary opening block size was as follows:

- **Identify East Side treatments where temporary openings will be created through clearcut, shelterwood removal, or shelterwood seed followed by shelterwood removal.**
- **Identify existing and planned temporary openings. Include stands that are less than 14 years old (stands equal to or greater than 14 years old are tall enough to no longer be considered a temporary opening, based on observations made in regenerating stands on the ANF). Also, see Appendix B, p. B-20.**
- **Calculate size of temporary opening. Consider when the Eastside treatment will occur (i.e. – now or in 2008) in calculation of temporary opening size.**

Area 6 – This block is less than 40 acres. Your table shows three stands where treatments are not proposed in East Side and one stand that is not adjacent.

Area 7 – East Side proposed treatment is a salvage thinning. East Side treatment does not affect temporary opening size.

Area 8 – This block is less than 40 acres. Your table shows three stands where treatments are not proposed in East Side. East Side treatment (st 19) does not include harvest, therefore it does not affect temporary opening size. Your table includes existing stands that are no longer considered to be temporary openings.

Comment 129-293 cont.

Area 9 – East Side proposed treatment is a salvage thinning. East Side treatment does not affect temporary opening size.

Area 10 – This block is less than 40 acres. Your table shows incorrect acres for 1 stand, includes one stand that is not adjacent to East Side treatment and one stand that is no longer considered to be a temporary opening.

Area 11 – This block equals 40 acres. Your table shows incorrect acres for three stands.

Area 12 – This block is block 15 on East Side Appendix B, Table 19. Total block size is 68 acres, not 127 acres. We show this block incorrectly as 48 acres in the DEIS.

Area 13 – This block is shown as block 16 on East Side Appendix B, Table 19. We calculate the block size to be 46 acres, not 80 acres.

Area 14 – This block is shown as block 10 on East Side Appendix B, Table 19. We calculate the block size to be 75 acres, not 120 acres.

Area 15 – This block is shown as block 21 on East Side Appendix B, Table 19. We calculate the block size to be 113 acres, not 188 acres.

Area 16 – This block is shown as block 19 on East Side Appendix B, Table 19. Total block size is 84 acres, not 95 acres.

Area 18 – This block is shown as block 12 on East Side Appendix B, Table 19. Total block size is 75 acres, not 285 acres.

Area 19 – This block is shown as blocks 13 and 14 on East Side Appendix B, Table 19. We show two blocks at 49 acres each, rather than one block of 251 acres.

Area 22 – This block is shown as block 8 on East Side Appendix B, Table 19. Total block size is 61 acres not 67 acres.

Area 28 – This block is shown as block 9 on East Side Appendix B, Table 19. Total block size is 49 acres, not 87.

Area 29 – This block is shown as block 4 on East Side Appendix B, Table 19. Total block size is 45 acres not 167 acres.

Area 30 – This block is shown as block 6 on East Side Appendix B, Table 19. Total block size is 51 acres, not 50 acres. We show the block size to be 85 acres in error in the DEIS.

Area 31 – This block is shown as block 1 on East Side Appendix B, Table 19. Total block size is 41 acres, not 43 acres.

Area 32 – This block is shown as block 3 on East Side Appendix B, Table 19. Total block size is 111 acres, not 108 acres.

Comment 129-294

10. Refer to Attachment 7. Attachment 7 is a newer breakdown of greater than 40 acre cuts as part of the East Side Project. Note that this breakdown can only be partial since we didn't have requested information on Rocket John, Thomas Rock, Coal Mine, and FR 446.

No attachment 7 was received with the East Side Comments. Carl Leland contacted Allegheny Defense Project by telephone on August 2, 2000 and informed them that we had not received the attachment. The person answering the phone said that they would get back to us. No further communications were received.

Comment 129-295

11. Many changes were made between the signing of the Mortality 11 Project DN/FONSI and the implementation of the 17 timber sales last summer. How is it that your predictions of forest conditions could be so off?

No "timber sales" that were included in the Mortality 2 project have been implemented nor will they be until the East Side EIS has been approved.

Comment 129-296

12. Last June you argued in Federal Court that if Federal Judge William Standish did not allow the sales to go through the trees would die and the opportunity to salvage them would be lost. Yet there is NO difference between the proposed Ritt's Salvage Sale and the East Side Proposal except for maybe additions to it. In other words, the Ritt's Salvage Sale opportunity apparently has NOT disappeared. Why did you lie to a federal judge?

Please see p. 259.

Comment 129-297

4. You have proposed a salvage thin for Compartment-39 Stand-2 (herein after Compartment Stand will be identified by C-39 S-2 instead of completely spelling out).
   a) This stand is nearly 100 years old (95 according to CDS compartment records). It should be left alone.
   b) This stand was recently thin cut. If thin cuts are supposed to improve the health and vigor of the remaining trees how is it that you need to salvage thin this stand? Please justify!
   c) Since this stand was recently thin cut how do you know that health and vigor won't improve - or is that all bull anyways?
   d) Hikes through this stand and adjacent stand reveal some truths such as the likelihood of any tree decline increases as you approach roads, cut areas, and skid trails. Furthermore, damage of trunks caused by skidder machines and compacting of soils seem to be good indicators of decline - predisposers of stress if you will. Consider this in your analysis.
   e) This stand is Soil Type 2 and should be looked at closer to make sure that it is ok for logging.
   f) Thin cutting increases concentration of fern and therefore this stand could be subjected to unnecessary increases in fern populations.
   g) This cut is in close proximity to an area already marked on hunting maps as needing increased deer hunting to maintain lower deer populations. How will this cut not exarcebate this problem?
   h) It is suggested by Forest Publication NE-96 that a minimal amount of plots need to be taken in order to ensure reliability in your analysis. It was further suggested by Forest Service personnel that in the case of salvage cuts stand condition tend to be more variable. NE-96 provides guidelines for both uniform and variable stands. Please answer the following questions for this stand:
      (1) NE?96 suggests that you need to take 7 more plots to obtain accurate data. Have you done this?
      (2) Have you revisited this plot since the Mortality 11 Decision was issued? If so, how many times, on what dates, with whom, and where are the results of your analysis maintained, and how are they maintained?
      (3) What was your methodology in determining the type of cut for this stand?
      (4) What species of tree do you believe are declining in this stand?
      (5) What species are in the understory of this stand?
      (6) Does this stand include habitat for ANY endangered species?

Compartment 639 Stand 2 is a 95 year old red maple stand that has suffered mortality. Plot data collected in 1995 shows that substantial numbers of trees are at risk and are in a state of decline and that many trees have already died. This stand meets the criteria for prescribing a salvage thinning treatment as described in Appendix B, p. 35. It also meets Forest Plan criteria for stands where this kind of silvicultural treatment can be considered (USDA-FS 1986a – p. 4-88). b) There have been no recent harvests in this stand, however timber harvest has occurred on adjacent private land. c) Salvage harvest will remove dead and dying trees. Residual trees will benefit from this treatment. d) Tree decline and mortality in this and other stands included in the East Side project is attributable to the series of defoliations and droughts referenced in Chapter 3, Vegetation Section. Forest Plan standards and guidelines limit the amount of soil compaction that is allowed to occur. Timber sale contract specifications impose penalties when excessive damage to residual trees occurs. e) Site characteristics have been reviewed by the Forest Terrestrial Ecologist to determine whether or not damage would occur from logging. Mitigation measures to protect resources in this stand are shown in Appendix D, p. 8. f) Fern interference is found on approximately 70% of Management Area 3 (USDA-FS 1995a, Appendix L p. 15). Fern interference is already found in the understory of this stand (Appendix B, p. 27). Salvage thinning harvest may result in increases in concentration of fern,

Comment 129-297 cont.

however the interference problem already exists in this stand. g) Seedling regeneration is generally absent in this stand. Salvage thinning will not change this condition, therefore this treatment will not change availability of browse for deer. Looking at a larger landscape, (See Map Set, Alternative 1 Section J) one can see that a block of treatments is prescribed (Blocks C-16, D-15,16) that includes salvage thinning, shelterwood seed/removal and final harvest. Shelterwood seed/removal and final harvest treatments will provide browse for deer. h) Specific answers follow:

1) **The SILVAH printout is used as a guide in combination with professional judgment in the preparation of stand prescriptions. The statistical information serves as an indication of the variability of condition within the stand, and to an extent, the utility of the data contained in the printout. The forester uses this information, along with field observations to determine the final prescription for the stand. It was not necessary to take additional plots.**
2) **The stand was revisited by the prescriber in the 1999/2000 field seasons**
3) **See Appendix B, p. B-35 for prescription development rationale.**
4) **Red maple, sugar maple and white ash are the tree species that are declining in the stand.**
5) **The understory of this stand is dominated by fern. Some beech and striped maple are also present.**
6) **This stand does not include habitat for endangered species.**

Comment 129-298

18 1. You have proposed a Salvage Removal Cut for Compartment-39 Stand-5. a) This stand has recently been cut and should be left alone.

Compartment 639 Stand 5 received a shelterwood seed cut in 1997 as part of the FR 165 project. Planning for this project occurred in 1993. The purpose of the seed cut, in combination with reforestation treatments, is to establish adequate seedling regeneration so that a shelterwood removal cut can occur. Subsequent to the FR 165 Decision and Mortality II decision, sufficient mortality was observed in this stand to include the stand in the East Side project. The current prescription included in Alternatives 1 and 3 is a shelterwood removal. This treatment completes the process initiated as part of the FR 165 project.

Comment 129-299

A. Avoiding Meaningful Public Comments

1. We have done our best to provide meaningful comment in a timely manner. There are so many issues we still have not been able to address. The Forest Service has overwhelmed the public by providing too much for comment in a short period of time. Interestingly enough, it is not clear to the public why this is even necessary. Already, the 14 (of 45) Timber sales opened for public comment exceed the allowable acreage to be impacted by removal cuts as allowable under the BO. Additionally, the Forest Service has already exceeded the allowable Incidental Take allowed for Fiscal Year 1998 in at least the following areas: Selection Cuts (72% greater than the Incidental Take), Motorized-Winter (4.1 miles of construction greater than allowed), Motorized- Summer (10.9 miles of construction greater than allowed), and Trails-Pedestrian (8.3 5 miles of construction greater than allowed).

Comment noted. Commentor suggests that the ANF has exceeded the allowable take identified in the BO. However, timber sales will be monitored to ensure that annual levels of incidental take will not be exceeded. The ANF will comply with the terms and conditions set forth in the BO. Also, see Comment 129-28.

Comment 129-300

B. Maximizing PETS Protection-1. The Draft EIS for the East Side Project fails to consider an alternative that truly maximizes protections for PETS species. Such an alternative would include zero logging activity combined with actions that would maximize watershed protection such as road obliteration and trail/campground rehabilitation. Another method of restoration would include the planting of native trees along troubled stream banks for soil stabilization purposes.

Alternative 1 complies with the BO and minimizes incidental take of T&E species. Under Alternative 1 individual rattlesnakes or water shrews could be impacted but these impacts would not cause a trend toward federal listing. No adverse impacts would occur to any other sensitive species and many species would benefit from improving the health of the forest ecosystem and sustaining the forest over the long-term. Alternative 5 (no action) may affect Indiana bats and may impact individual northern long-eared bats (Appendix C pp. C-42 and C-43). Also, see Chapter 2, Alternatives Considered but Eliminated from Detailed Study.

Comment 129-301

2. In addition to the information referenced in the Draft EIS, the Forest Service also has on hand a study completed in October of 1997 that sheds light on PETS species. This study and others sheds new light on whether or not the proposed East Side Project will impact viable populations of species on the Allegheny. Considering the greatly increased list of PETS species and the growing information available, it is clear that the Draft EIS for the East Side Project does not adequately address environmental concerns protected by the NEPA and the NFMA.

The analysis of PETS species and their habitat in the Draft and Final EIS for East Side was based on the updated Regional Foresters sensitive species list, as well as the most current and applicable information, including on-Forest monitoring, related to threatened, endangered and sensitive species. As a result, effects to PETS species and their habitat are fully evaluated in the BA (Appendix C).

Comment 129-302

C. Relevance of New Information-1. The Draft EIS for the East Side Project makes a number of determinations that imply decisions have been made - decisions made at inappropriate stages in fact. The purpose of the currently ongoing Forest Plan amendment and accompanying EIS is to make the determination as to what changes might need to be made regarding MA 3.0 and/or 6.1 Objectives. Forest Service statements in the Draft EIS suggest that the Forest Service has already made a determination more appropriate for the Forest Plan amendment process which has not yet been completed. Not only would such a decision constitute arbitrary and capricious action on behalf of the Forest Service but it would also mean that the Forest Service has denied the public their right to review and comment on the EIS and Proposed Amendment (the citizen right to appeal would also have been foregone). Furthermore, it was not the purpose of the BO to determine whether or not the new information on PETS species required changes to the Objectives in the Forest Plan for MAs 3.0 and 6. 1. The BO only addresses some of this new information and does so with an intent different from that set forth in the Forest Plan. In fact, the terms and conditions are not entirely explicit in what they would finally require of the Forest Service. Many of them are drafted in a fashion that requires the Forest Service to develop what measures would be taken in meeting the given term or conditions. Finally, the terms and conditions are not the sole aspect of the BO that the Forest Service is required to review. The BO provides a wealth of information useful to the conservation of the threatened and endangered species discussed, and it also provides a number of conservation recommendations that the Forest Service, though not required to follow, is expected to consider. Forest Service statements to the effect that the relevant information in the BO equates solely to the terms and conditions clearly shows that the Forest Service has no intention of even considering action beyond them, including consideration of the conservation recommendations.

The FEIS for Threatened and Endangered Species on the ANF, which was approved on July 28, 2000, revises three existing Standards and Guidelines, adds 12 new guidelines, and approves conservation recommendations for the Indiana bat, bald eagle, northern riffleshell. The analysis presented in the BA (Appendix C) includes information presented in the 7/28/00 FEIS (Appendix C p. C-1).

Comment 129-303

D. Review of Comments Received from the Public During Scoping-1. The Draft EIS for the East Side Project includes an appendix entitled "Scoping." This section summarizes whether or not the Forest Service received comments during the scoping public comment period when the original East Side Project was announced. This section does not, however, address those comments raised regarding PETS species, instead preferring to essentially dismiss them as being adequately addressed already. The Forest Service concludes without clear justification that the public comments do not require additional consideration or response. The original comments on East Side Project are not adequately addressed. The Forest Service has acted arbitrarily and capriciously by intentionally considering only parts of the public record for the East Side Project, by failing to re-address issues regarding the new information on PETS species that were raised during prior public comment periods, and by failing to incorporate public comment to develop an adequate range of alternatives as required by NEPA.

All comments concerning PETS species received during the scoping period were considered during that phase of the project. The purpose of soliciting comments during the scoping period is to determine the "scope" of the issues that are related to a proposed action (40 CFR 1501.7). See Appendix A and Chapter 1, p. 8 for a discussion of the process used. Additionally, PETS species were analyzed on the BA.

Comment 129-304

E. Review of Range of Alternatives-1. The Forest Service's dismissal of consideration of alternatives is troubling. While clearly ignoring major portions of the administrative record, the East Side Draft EIS suggests that new alternatives don't need to be developed because the new information does not suggest a need for new alternatives but new analysis. Without any substantiating analysis the Forest Service seems to take the position that new information on PETS species never suggests the need to revisit the original analysis and develop new alternatives. This is not consistent with the NEPA mandated consideration of a broad range of alternatives. If new information becomes available that suggests that a proposed action will affect a species that the Forest Service previously presumed absent from the Allegheny, clearly that information suggests the need for a new alternative, if for example that alternative may have preferable outcomes to the proposed action, and especially if that alternative is in regard to an endangered species.

No issues were raised during the scoping phase of the East Side project that would have generated an alternative regarding PETS species. See Comment 129-303.

Comment 129-305

The value of biodiversity is the value of everything there is. It is the summed value of all the GNPs of all the countries from now until the end of the world. We know that, because our very lives are dependent upon biodiversity. If biodiversity is reduced sufficiently, and we do not know the disaster point, there will no longer be any conscious beings. With them will go all value - economic and otherwise. -- Boyd Norton

This is a quote.

Comment 129-306

Thank you for this opportunity to comment on the proposed East Side Project. Please select the Zero-cut action alternative for the East Side Project. Also, please schedule a number of public meetings to discuss the merits of the East Side Project with concerned citizens, to be held in surrounding Allegheny communities during the summer and early fall of 2000. Minimally this would include meetings in Warren, Harrisburg, Clarion, Buffalo, and Pittsburgh, Jamestown, Bradford, Erie, Cleveland, New York City, Ithaca, State College, Rochester, Philadelphia, and others.

See the Record of Decision or the rationale for the selection of the preferred alternative. Pages A-6 through A-11 lists all of the organizations and individuals who were sent a copy of the DEIS or Summary. There were no requests for public meetings received with the exception of the demand for multiple meetings by the Allegheny Defense Project.

Letter #130 - Note signed by Denise Roberts attached to petition forms containing 263 signatures (see project file for complete petition)

Comment 130-1

: I've enclosed over 100 signatures, for the petition to help stop the largest timber sale in the East. It took me 2 weeks, but I did it! People are very supportive, when it concerns deforestation of our land, and massive development..It needs to stop! If the contractors and builders continue to destroy our land, the damage will be irreversible. And, as you know, they are cutting off our natural resources and the air that we breath! I appreciate all the hard work you are doing. Please keep up the good work!

Comment noted.

Comment 130-2

Actual petition received with 263 signatures: We, the undersigned, ask the U.S. Forest Service to select the Zero-Cut Alternative for the East Side Timber Sale.

Comment noted.

Comment 130-3

The East Side Timber Sale proposes the extraction of 66 million board feet of timber from Pennsylvania's only national forest - the Allegheny. To do this the Forest Service plans to log 8,666 acres, including clearcuts on over 3,000 acres, to spray toxic herbicides on over 3,500 acres, to construct over 15 miles of new logging roads, and to "reconstruct" over 100 miles of other logging roads.

Comment noted.

Comment 130-4

These proposed activities will fragment thousands of acres on our national forest at a major cost to taxpayers.

Please see the Fragmentation discussion in the Wildlife section p. 205.

Letter #131 – Michael Hepinger

Comment 131-1

The following statements are my comments that refer to the East Side Project:

Comment noted.

Comment 131-2

I agree and support the harvesting of Timber while using even-age management techniques.

Comment noted.

Comment 131-3

The Forest Service should step-up efforts and continue to conduct salvage timber sales.

Comment noted.

Comment 131-4

I prefer the selection of Alternative #1. By selecting this alternative, the Forest Plan objectives are met.

Comment noted. See the Record of Decision for the rationale for the selection of the preferred alternative.

Comment 131-5

I agree with the "Summary of Determinations" on pages 179 and 180 of the East Side EIS.

Comment noted.

Comment 131-6

I support proposed reforestation efforts including site preparation, herbiciding, fencing, and planting.

Comment noted.

Comment 131-7

Please consider these comments as you continue to manage the Allegheny National Forest.

Comment noted.

Letter #132 – Susan Swanson, Allegheny Hardwood Utilization Group, Executive Director

Comment 132-1

On behalf of the members of the Allegheny Hardwoods Utilization Group, Inc. (AHUG), I would like to provide the following comments regarding the East Side Draft Environmental Impact Statement (DEIS).

Comment noted.

Comment 132-2

We agree that the "need for the proposal" on pages 2 and 3 of the summary will "enhance present conditions."

Comment noted.

Comment 132-3

We support the harvesting of trees, especially when using even-age management techniques.

Comment noted.

Comment 132-4

We support the use of herbicides to control interfering vegetation.

Comment noted.

Comment 132-5

We expect the Forest Service to salvage and treat dead and dying timber to the extent it is economically feasible, but also to maintain and perpetuate a healthy forest.

Comment noted.

Comment 132-6

We do not support using uneven-age silviculture in Allegheny Hardwood stands. These are even-age stands and the Forest, Service should not be forcing them to become some something they are not. The use of uneven-age management should be concentrated in riparian areas.

Comment noted.

Comment 132-7

We agree with the "Summary of Determinations" on pages 179 and 180 of the Draft EIS.

Comment noted.

Comment 132-8

We support Alternative 1 for best meeting the mission of the forest plan.

Comment noted. See the Record of Decision for the rationale for the selection of the preferred alternative.

Comment 132-9

Thank for the opportunity to comment on this project.

Comment noted.

Letter #133 – Stacy McCormack

Comment 133-1

I would like to voice my opinion about the East Side Project.

Comment noted.

Comment 133-2

It is my opinion as a Env. Policy Studies Master's student at New Jersey Institute of Tech that their be no cutting, herbicide, road building or fencing.

Comment noted.

Comment.133-3

Public land should be considered for the public not big money agencies & their affiliates. The U.S. Forest Service should not continue to add to their discraceful [sic] record of cutting public lands.

Comment noted.

Comment 133-4

I totally opposed commercial logging on public land or new road building.

Comment noted.

Comment 133-5

Lets try to think about the future & not money, huh. This is not ecologically sound mangement [sic], I think we all know its all about the money. Do the right thing - don't sell our future to big corporaitons.

Comment noted.

Letter #134 –Robert Leslie

Comment 134-1

I concur with Alternative 1 - The Proposed Action, for management of the East Side Project.

Comment noted. See the Record of Decision for the rationale for the selection of the preferred alternative.

Comment 134-2

In Chapter 3 Environmental Consequences, Section Socio-Economic, Alternate 1 plainly shows the economic benefit to the local community and the U.S. Treasury for that Alternative. All other benefits to the forest will accrue as shown by following all standards and guidelines to move the project area toward the Desired Future Condition?of the Allegheny National Forest as set forth in The Forest Plan.

Comment noted.

Comment 134-3

The delay already imposed on the ANF by litigous individuals and groups, most of whom are not local stakeholders of the outcomes, has cost the ANF, the U.S. Treasury and local communities significant dollar losses.

Comment noted.

Comment 134-4

The recreation public are now subjected to visual costs of many areas of dead, standing trees

Comment noted.

Comment 135-1

Thank you for the information on the East side Project.

Comment noted.

Letter #135 – Ray Egger

Comment 135-2

I agree with the Forest Service's Alternative #1, I firmly believe that we must utilize our national forest resources through management. We have taken away Mother Natures way, which can be cruel, with fires & insects so we must replace Mother Natures way with common sense. However what we seem to be lacking in this society is common sense, I hope that the Forest Service will be able to continue to manage the Allegheny National Forest long into the future with common sense.

Comment noted. See the Record of Decision for the rationale for the selection of the preferred alternative.

Comment 135-3

P.S. Caring for the land and serving ALL the people.

Comment noted.

Letter #138 – Dale Anderson, Pennsylvania Forest Industry Association, President

Comment 138-1

The Pennsylvania Forest Industry Association is a grass-roots, non-profit, bioregional organization of forest resource caretakers and affiliated concerned citizens. We include members from many states with interests that are biodiverse. PFIA spans numerous ecosystems.

Comment noted.

Comment 138-2

We support the even age management systems employed in the East Side project to achieve the desired future outcome as outlined on pages 2 & 3 of the draft EIS summary. The ANF consists of even aged timber stands and we should not be forcing these timber stands to be something that they are not. Un-even aged stand treatments must be restricted to the riparian stands that contain hemlock. This will help with the cold water fisheries.

Comment noted.

Comment 138-3

The northern hardwood forests stands of the ANF are very valuable and unique to the world, These stands will be replaced by less desirable stands if they are not managed properly. The ANF has an obligation to the public to maintain these high value forests.

Comment noted.

Comment 138-4

We oppose the destruction of a capital asset such as roads. These roads were mostly built with timber revenues and need to be left in place for future management activities. Roads not needed for immediate management activities can be successfully retired by seeding, water barring, and gates to await future need., Obliterating roads will only lead to more "roadless" areas.

Comment noted.

Comment 138-5

The USFS has a unique window of opportunity to regenerate some decadent stands in the East Side Project. This window will close, the public will lose the investment, and the forest stands will continue to deteriorate if this action is not carried out. This action should apply to green stands as well as stands that need salvage treatments.

Comment noted.

Comment 138-6

PFIA has taken part in USFS tours that explain the actions of the East Side Project. When a professional forester with a 21 year career on the ANF explains what forest management actions are needed for a healthy forest, we believe him. This forester has more time in his career than the crazy "stop doing that" crowd is years old. We need to pay attention to the professionals employed by the forest service, and not the professional activists of the "stop doing that" crowd.

Comment noted.

Comment 138-7

We support the proposed reforestation, including fencing, herbicide treatment, and site preparation.

Comment noted.

Comment 138-8

We support salvage thinning and "green treatments" as described in the preferred alternative.

Comment noted.

Comment 138-9

This package of information cost $5.33 in postage to ship to PFIA. It is a ridiculous amount of data to sift through.

Comment noted.

Comment 138-10

We support and prefer Alternative 1. This alternative moves the forest towards the desired future condition as outlined in the forest plan.

Comment noted. See the Record of Decision for the rationale for the selection of the preferred alternative.

Letter #139 – Mark Donham, Regional Association of Concerned Environmentalists, President

Comment 139-1

See Comment Letter #15 and original letter in Project File. All comments are exactly the same except for additional statement preceeding comment #1 (see **) and a final comment added at the end. Also, a few minor wording changes did not affect context of comments. Comment #1: "*These are the comments of the Regional Association of Concerned Environmentalists (RACE), a grassroots environmental organization from Southern Illinois and Western Kentucky, with a long history of involvement in national forest issues, regarding the East Side Timber sale. We believe the proposed East Side Timber Sale*." This sale, previously titled "Mortality II" poses a serious threat to the native ecology of the Allegheny National Forest.

Comment noted. See the Record of Decision for the rationale for the selection of the preferred alternative.

Comment 139-2

Please keep us on the mailing list regarding this project.

Comment noted. A copy of the FEIS will be sent to you.

Letter #140 - Bill Brainerd

Comment 140-1

I have comments on the DEIS for the ESP.

Comment noted.

Comment 140-2

With your obligation or obsession to get the cut out, I am skeptical there is as much mortality in the ANF as you say. The 1995 Timber Salvage Rider proved what a convenient word is salvage when you want timber, living or dead.

Comment noted.

Comment 140-3

Assuming there is some mortality, I might condone vegetation management, 1., p. 20, under Alternatives Eliminated. The ANF will eventually regenerate itself, but at least this alternative seems to do little harm and could speed up the process. You eliminated it because it doesn't meet Need 1, p.3, but salvage of dying trees for someone's economic gain is, by the text itself, an "opportunity", not a need. Needs 3 and 4, but reducing stocking levels and bring MA 3.0 to the DFC are needs only if one thinks the ANF should be logged. I don't, and in this time of global warming you shouldn't either. Need 5. but National Forests fortunately provide so small a % of this country's timber, people can easily get along without it. Black cherry is a luxury. I don't condone vegetation management 2.,3., or 4., p. 21. Among your 5 surviving alternatives, 1. (Proposed Action) I like least. According to Table 5, only about 40% of the 8,000 + acres you plan to log are morbid. 60% are healthy. The ESP is, for the most part, a normal timber sale, except for its unprecedented size. Judged by acres logged, salvage is a come-on. 2.,3., and 4. Each are better than 1., because they drop "other resource management objectives" (for now), new roads, and even-age clearcuts, respectively. But 2. Just postpones things, 3. Retains much road restoration, 4. Is cosmetic. I prefer Alternative 5. I like our NFs as is, or as they would be, without the USFS.

Comment noted. See the Record of Decision for the rationale for the selection of the preferred alternative.

Comment 140-4

Thanks for the glossary Chap. 6.

You are welcome.

Letter #141 – James Rauch

Comment 14-1

Subject: Comments on East Side Project DEIS, April 2000

Comment noted.

Comment 141-2

1) The FS has not presented the necessary range of alternatives that reflects the full range of scoping requests made and the full mix of, unresolved issues. In scoping comment (3), I requested the development of a restoration of ecosystem integrity alternative. The closest alternative to this is Alternative 4, the uneven-aged timber management alternative that is required by the 1997 court decision. Presumably, the court intended the decision making process to include independent, detailed, de novo, evaluation of UEAM, which could easily be interpreted to include such options as the restoration of ecosystem integrity through the passive functioning of natural ecological processes or active intervention measures if necessary. This has not been done. In view of this failure I am forced to support Alternative 5, the "No Action" alternative.

Please see the Alternatives Considered but Eliminated from Detailed Study section of Chapter 2, Ecological Restoration Alternative.

Comment 141-3

2) A major negative impact of implementing the preferred alternative is further foreclosure of the already receding opportunities to restore and preserve native mature forests, their biodiversity and watershed values, and their ecological processes at the landscape level. In this part of the country these opportunities are predominantly only available on the large public land tracts. Foregoing this ecosystem restoration opportunity now carries the likelihood of its permanent foreclosure, in view of increasing human population pressures and global economic and social trends. The limited discussion and documentation of this issue, especially impacts of edge, openings, and fragmentation, is inadequate and one-sided and does not support the conclusions asserted.

Please see the Purpose and Need section of Chapter 1. Also, see the Wildlife section of Chapter 3.

Comment 141-4

3) What I glean from the discussion presented in Appendix F and this DEIS is that historically the FS has almost exclusively practiced EAM with an increasingly disproportionate emphasis on acreage devoted to high value black cherry timber production at the expense of the native forest types, that "adequate" regeneration is claimed for EAM stands versus "marginal" regeneration for UEAM stands, and that insect, disease and decline problems reported with some UEAM species', specifically beech and sugar maple, are being put forward as reasons not to restore native forest conditions or to use UEAM practices.

The discussion presented in Appendix F, largely based on a review of the fourteen year old Forest Plan and FP FEIS, concludes that "we need to limit the application of UEAM" until better regeneration results Can be assured (page F-7).

The ANF's regeneration problems are principally attributed to deer overpopulation and attendant heavy browsing. Yet incredibly, the principal causes of the deer overpopulation/browsing/regeneration problem, namely the historic clearcuts and continuing EAM practices, are glossed over in this DEIS.

The FS has acknowledged that high deer numbers (overpopulation) are a major cause of forest regeneration difficulties and failures, and that deer herds can move great distances, yet the FS continues to apply even-aged timber harvesting methods that were at the turn of the century, and which continue to be, the major cause of deer overpopulation.

Without sound method(s) to resolve this problem, continuation of the EAM practices of preferred Alternative 1 and Alternatives 2 and 3, which are the fundamental causes of this problem, would be unwise and without support. (See my scoping comment 7).

The FS has failed to accurately and quantitatively describe the causes and to effectively address the severe deer browsing problem (need 2, on page 4). A more complete examination of all the factors that contribute to this problem should be presented, in particular a comparative evaluation of the relative contributions of the various vegetative treatment methods. And the full range of potential mitigation measures should be presented -- including measures to increase hunter numbers and take, immunocontraception, and bait and shoot -- until transition to the most economic long-term solution, the restoration of the vertical diversity of the mature native forests at the landscape level, is realized.

The mitigation measures the FS has employed to date -- fencing, supplemental planting and re-seeding, fertilization, and herbicide application -- are very expensive and would become largely unnecessary when deer numbers are stabilized at natural levels under the modified alternative 4 recommended above in comment (1). The DEIS fails to distinguish differences in need for these measures among the various vegetative treatments/alternatives and differences in the corresponding economic requirements (investment).

The conditions necessary to "maintain desired levels" of demand species are much different from the conditions in mature native forests on a landscape that has attained sustainable ecosystem integrity. I am opposed to manipulation of conditions to create unnaturally high levels of demand species. Most true hunter/conservationists do not support such manipulated imbalances.

It is disappointing that the FS has allied itself with sections of the hunting community that seek more deer in order to gain their support of the large-scale, even-aged timber management practices that are the principal source of this major forest regeneration problem. It is disturbing that a large part of the actions that contribute to this problem are promoted as "wildlife work" to garner such support.

Much of the type of trade-off analysis you suggest was completed when the ANF Forest Plan was developed. The Forest Plan FEIS documents the competitive interactions considered (USDA-FS 1986, Chapter 4) and presents a summary in Chapter 2 (USDA-FS 1986, Chapter 2, pp 61 to 65). You suggest a return to mature native forests which existed before European occupation of the ANF area, a management strategy most similar to Forest Plan FEIS Alternative A (USDA-FS 1986, Chapter 2, pp 26 and 27, Chapter 4, p 94-95). The decision maker did not select Alternative A as the guiding management philosophy for the ANF; rather he selected Alternative D. The trade-offs he considered are documented in the Record of Decision (USDA-FS 1986b, pp 6-25), with specific mention of wildlife considerations on pp 17-19. He recognized this type of controversy would continue (p 26) and determined Alternative D would provide the maximum net public benefit in an environmentally sound manner (USDA-FS 1986b, pp 5 and 6). The controversy over and impact of high deer

Comment 141-4 cont.

populations can best be resolved through increased deer harvest while continuing to create early successional habitats to benefit deer and a host of other wildlife species (USDA-FS 1986b, pp 22 - 26). The even-aged treatments proposed in the East Side project are consistent with Forest Plan Alternative D. The Forest Plan analysis recognized the desirability of reducing investments necessary to establish and develop tree seedlings. In all Forest Plan alternatives, achieving this objective would require bringing the deer herd in line with habitat carrying capacity (USDA-FS 1986c, p 75).

The information in Appendix F provides a summary of the consideration given in the Forest Plan analysis to the use of uneven-aged management verses even-aged management. The East Side proposal is tiered to the Forest Plan and accompanying FEIS. Changing the direction of the Forest Plan is not part of the Purpose and Need of a project level proposal. Forest Plan revision is a more appropriate time to consider a change in direction for the Forest Plan. Deer populations are controlled by the regulations of the state of Pennsylvania.

Comment 141-5

4) On page F-7 it is stated that "(r)egeneration requirements for tree seedling species needed to successfully maintain uneven-aged stands over the long term are not well understood. Adaptive management and administrative studies are underway to gain better local understanding. These kinds of studies can take an extended period of time, so results may not come quickly." The nature of these adaptive management and administrative studies should have been identified and thoroughly explained. A thorough and independent analysis of these UEAM issues is essential to a supportable decision.

A description of the ANF adaptive management program is found in the project file. Also, a summary of the adaptive management program can be found in the annual Monitoring and Evaluation Report (see for example, USDA-ANF 1999, pp. 80- 82).

The ANF conducts annual evaluation of the success of UEAM treatments. A summary of findings can be found in the annual Monitoring and Evaluation Report (see for example, USDA-ANF 1999, p. 17). As can be seen in Table 5 of that report, success rates for uneven-aged management fall far below that reported for even-aged management activities. We are actively pursuing gaining additional local information on the application of UEAM treatments (USDA-ANF 1999, pp. 86-87)

Comment 141-6

Wouldn't "seedlings of the various tree species" or just "tree seedlings" convey meaning better than "tree seedling species"?

Comment noted.

Comment 141-7

5) Other factors mentioned as contributing to regeneration problems are diseases and insect attack. It should be stressed that several of these agents, including gypsy moth, chestnut blight, beech scale, and Pyrrhalta, are aliens brought in by humans, either intentionally or otherwise, and as such their introduction should be viewed as major human management blunders that have wrought catastrophic ecological consequences. For example, the gypsy moth was bought in under the erroneous belief that it would be a lucrative source of silk production. Although no mention is made of the potentially massive future destruction that may result from the recent "free trade" introductions of the Asian Long Horn beetle, may it be assumed that the FS response to this threat will be similar? Measures effective in preventing further alien introductions to the ANF and appropriate mechanisms for their implementation should have been identified and presented in detail in this DEIS.

We are also concerned about the potential impacts to ANF forest ecosystems from the introduction of exotic pests. ANF personnel and USDA-Forest Service Forest Health Protection personnel (entomologists and pathologists) are always on the alert for these kinds of pests. Other branches of the Federal government have responsibility for regulating the introduction of exotic pests into the United States. Analysis and development of the type of measures you have suggested are beyond the scope of this East Side Project analysis.

Comment 141-8

6) The negative effects of acid precipitation on base cation levels and maple root nutrient uptake is mentioned as an unconfirmed cause of sugar maple decline. This effect is well documented. Rather than identifying the heavy atmospheric acid deposition occurring on the ANF as a problem requiring government action, the FS seems content to simply identify it as a further problem arguing against any significant implementation of UEAM.

We agree it is well documented that acid precipitation causes accelerated depletion of soil base cation levels. Locally, however, we believe the observed maple decline results from more complex interactions than you suggest. Recent research has shown that sugar maple decline on the Northern Allegheny Plateau of Pennsylvania results from an interaction between low foliar levels of magnesium and calcium coupled with excessive levels of insect defoliation (Horsley et al, in press). From a regional perspective, research has shown that without defoliation stress, low levels of calcium and magnesium do not result in sugar maple decline (Hallett et al 1999a and Hallett et al 1999b). Additional discussion regarding local sugar maple decline can be found in the East Side EIS (pp 88, 90, and Appendix B pp 3-8).

Sugar maple decline is only one of many factors mentioned in the East Side EIS which locally affect the feasibility of uneven-aged management (DEIS pp 110-117, 130-132, 203-205, Appendix F p 8, and Appendix B pp 15-20). Assessing the merits of government action dealing with acid deposition is beyond the scope of the East Side analysis.

Comment 141-9

7) This project will further delay meeting the old growth percentage targets in the Forest Plan. By conducting separate environmental reviews for various concurrent timber removal projects across the ANF, and asserting in each project that opportunities exist elsewhere on the ANF to meet the old growth targets, the FS is being disingenuous and is violating public review procedures.

Please Tables 16, 17, and 18. All alternatives result in a greater percentage of old growth at the end of the planning decade.

Comment 141-10

8) This project contains a preferred alternative which is a major federal action having very large and long-lasting impacts. Some of the foreseeable impacts of implementing the preferred alternative, including the potential extinction of species, are irreversible. For example, it is stated that the small-whorled pogonia is not found in the project area. This does not mean that it may not be present and be discovered by additional surveying. Monitoring, surveying and inventorying(adaptive management) have been FS weaknesses.

Comment noted. Please see Appendix C, the Biological Assessment.

Comment 141-11

9) In scoping comment (5a) I requested a qualitative and quantitative assessment of soil and humus loss. The discussion on pages 40 to 44 does not identify, quantitate and compare the degree of damage to the affected pedons under each alternative. It is inadequate for public review purposes. The described upper limit of 15 percent soil loss through erosion is not insignificant for each project, but rather carries long-term, cumulative productivity reduction consequences. A functional ecosystem (intact ecological processes) should not require exogenous fertilization. It is observed that compaction can affect productivity since it reduces soil porosity and the rate of water filtration [and other effects such as altered gas exchange]. But no comparative quantitative assessment of the degree of compaction and productivity effect differences among the various vegetative treatments is given nor are measure(s) to mitigate or avoid this large negative impact offered. This is insufficient for public review purposes. Such measures as limiting harvesting to periods when the ground is solidly frozen should be evaluated.

The 15% guideline contains all types of surface disturbance – surface disturbance (7.8%*), displacement(1.7%), puddling(.1%), erosion(.2%), and observed compaction(4.4%) with a total surface disturbance of 14.2% for a period from 1990 to 1998 (*ANF 1998 Monitoring Report). This is relevant information and is used in determining cumulative affects. The monitoring is based on looking at various vegetation harvesting operations on landtypes that are well drained, moderately well drained and/or poorly drained. The soil determinants for all these disturbances are surface soil texture(with % of surface rocks), internal soil drainage, slope, bare soil, weather, equipment operator, and sale administration during the harvest cycle. These factors are all considered when mitigating measures are prescribed for each harvest site based on landtypes.

Comment 141-12

10) I share the concern of other commenters that the projected timber harvest under the preferred alternative will exceed sustainable levels. A few timber companies' economic "need" to utilize the ANF as a cherry cropping operation (although only a negligible percentage of the nation's sawtimber production) has received disproportionate weight in comparison with the more important biodiversity, watershed protection, and recreation values and services that increasingly can only be provided on large public tracts such as the ANF.

The proposed timber harvest is well within sustainable levels for the proposed action.

Comment 141-13

11) The complete change in the mapping format (map section boundaries, keys and legends) used in the 4/00 DEIS from that used in the 4/98 scoping documents has made it very difficult for the public to follow changes in the development of this proposal. For the preferred alternative, it appears that significant changes in the treatments and treatment areas have been made since the scoping proposal with little or no explanation of the reasons for these changes. This is a poor way to conduct the public review for this major action.

Comment noted. We apologize for any inconvenience caused by the change in mapping format. Changes between the Scoping period and the 45 day comment period for the DEIS were not significant. Members of the Forest Service staff are available to help at any time.

Comment 141-14

12) Until the Roadless Areas review and the revision of the National Forest System Land and Resource Management Planning regulations are completed, and in view of the preceding comments, the "No Action" alternative, Alternative 5, should be selected at this time.

Comment noted.

Comment 141-15

Please send me a paper copy of the FEIS and ROD.

You will be sent a copy of the FEIS and ROD.

Letter #142 –Jim Bensman, Heartwood

Comment 142-1

We are in receipt of your denial of our request for an extension of time to comment. As our request points out, the Forest Service holding these sales and sending them all out at once is illegal. This constitutes our comments on the East Side timber sale. Since the Forest Service sent them all out at the same time, we have not had time to review them. Therefore, we cannot adequately comment on them. We again request an extension of time.

This comment appears to be directed at the Supplemental EA process. The East Side DEIS was not sent out with any others project proposals.

Comment 142-2

Logging is an inappropriate use of National Forests and should not be allowed.

Comment noted.

Comment 142-3

Our April 6, 2000, comments on the first set of EAs enclosed a copy of a May 9, 1999, letter to John MacGregor on his Indiana bat monitoring. It should be considered for these sales. We also enclosed a copy of our comments on the draft recovery plan. While a large portion of the material is not relevant, it cites extensive research that contradicts the conclusions the Forest Service has reached. All of the research we cite, needs to be considered. We also note that you have ignored the September 6, 1999, letter on Dr. Whitaker's comments. We include this letter by reference. We also included a copy of the USFWS's comments on the draft recovery plan. They need to be considered.

This comment appears to be directed at the Supplemental EA process. Please see Appendix C, the Biological Assessment for information regarding literature used in the analysis.

Comment 142-4

See Comment Letter #15 and original letter in Project File. All comments are exactly the same as Letter #15, Comments 1-14.

Letter #143 – John Forren, US Environmental Protection Agency, Program Manager

Comment 143-1

In accordance with the National Environmental Policy Act (NEPA) and Section 305 of the Clean Air Act, the Environmental Protection Agency (EPA) has reviewed the DEIS for vegetative composition, age distribution, forest cover type distributions, and other resource management activities to move the project area from the Existing Condition (EC) towards the Desired Future Condition (DFC) as outlined in the Allegheny National Forest Land and Resource Management Plan, as amended, 1986.

Comment noted.

Comment 143-2

The USDA-Forest Service proposes management activities in Management Areas (MAs) 2.0, 3.0, 6.1, 7, and 8 of the East Side project are primarily because of a series of defoliations caused by elm spanworm and forest tent caterpillar, in conjunction with a series of droughts, has resulted in an increase of tree mortality and decline. The alternatives in the DEIS for the project area provide for site-specific implementation of management activities for these MAs as well as minor amounts of treatments proposed by the Northeastern Research Station in MA 8.

Comment noted.

Comment 143-3

Based on our review the EPA has assigned a rating of LO (Lack of Objection) to Alternative 1, the Proposed Action, Alternative 2, Alternative 3, Alternative 4, and Alternative 5, the No Action Alternative, and an overall rating of 1 (Adequate) for the DEIS. A copy of the rating system is enclosed for your information.

Comment noted.

Comment 143-4

We concur with the Forest Service that Alternative 1, the preferred alternative. best meets, the needs of the Forest Service to meet the objectives of the Forest Plan in the project area. This alternative will restore forested ecosystems by initiating regeneration harvest and reforestation prescriptions in areas of severe mortality while salvage harvesting is proposed in areas of light to moderate mortality. Vegetation management (timber harvest) and wildlife habitat enhancement activities will be implemented in stands not impacted by mortality but is necessary to achieve Forest Plan objectives. Roadway systems will be provided to facilitate implementation of proposed activities. According to Forest Plan direction, vegetation is managed primarily through use of even-aged systems in Mas 3.0 and 6. 1, and uneven-aged systems in MA 2.0.

Comment noted.

Comment 143-5

We are in agreement with the proposed measures to protect water quality within the project area. Surfacing roads with limestone will significantly reduce sediment loads and associated turbidity in receiving waters.

Comment noted.

Comment 143-6

Stringent adherence to mitigation measures for the application of herbicides will significantly lessen the potential for ecosystem and human health risks. The establishment of 25-75 foot buffers will effectively prevent herbicides from entering stream courses.

Comment noted.

Comment 143-7

Thank you for providing EPA with the opportunity to comment on the DEIS. If you have any questions regarding our comments please contact Marria O'Malley Walsh at (570) 628-9685.

Comment noted.

USDI Fish and Wildlife Service Concurrence Letter

Eastside Map Index

The maps associated with the alternatives are in post script format.

- Cover 1
- Cover 2

Index	Alternative 1	Alternative 2	Alternatve 3	Alternatve 4
a	a	a	a	a
b	b	b	b	b
c	c	c	c	c
d	d	d	d	d
e	e	e	e	e
f	f	f	f	f
g	g	g	g	g
h	h	h	h	h
i	i	i	i	i
j	j	j	j	j

Thank you for your interest and participation!

Return to the ANF Homepage

E-mail with any problems detected.