Salmon West

Environmental Assessment

United States Department of Agriculture

Forest Service

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Marienville Ranger District
Allegheny National Forest

Warrants 3183, 5101, 5105, 5106, 5107, and 5267, Howe Township

Warrants 3171 (Lots 12, 13, 14, 15 and 16), 3174 (Lots 50, 55, 56 and 58), 3179 (Lots 43, 44, 45, 46, 51, 52, 53, 54, 59 and 60), 3181 (Lot 37), 3183, 3191, 5110, 5129, 5136, 5137, 5138, 5139, 5140, and 5144, Jenks Township

Warrants 5104, 5105, 5107, 5108, 5109, 5110, 5128, 5129, 5131, 5134, 5135, 5136, 5137, 5138, and 5269, Kingsley Township

Forest County, Pennsylvania

For Information Contact:

Kevin Treese
USDA-Forest Service
Marienville Ranger District
131 Smokey Lane
Marienville, PA 16239
(814) 927-5759

http://www.fs.fed.us/r9/forests/allegheny/projects/vegetative_management/

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EXECUTIVE SUMMARY

The Marienville Ranger District of the Allegheny National Forest is proposing the following management activities for the Salomon West Project (Alternative 1: Proposed Action)

- Creation of 1,380 acres of early structural habitat using even-aged management.
- Uneven-aged management on 278 acres to increase within stand structure.
- Oak management on 498 acres to maintain or increase oak species.
- Intermediate thinning on 877 acres to promote stand growth, tree vigor, and species diversity.
- Reforestation activities listed in Table 1 on page 9 to maintain and improve forest health through the promotion of stand growth, tree vigor, and species diversity.
- Wildlife habitat improvements on 169 acres, including installing 51 wildlife structures, planting 59 acres, enhancing 49 acres (including several stone pits) of herbaceous openings, releasing shrubs and mast-producing trees on 7 acres, regenerating aspen on 9 acres, and reclaiming 29 acres of stone pits as herbaceous openings.
- Felling trees along 1.4 miles of Little Salmon Creek introducing large wood into the stream to improve aquatic habitat, trap sediment, and slow flood flows. Adding in-stream structures along 2,400 feet of Salmon Creek and The Branch to help stabilize eroding banks and improve aquatic habitat.
- Treatment of 188 acres of non-native invasive plant species along road corridors and within stands using manual, mechanical, and chemical methods.
- Improving 19 dispersed camping sites, closing 35 dispersed camping sites, and converting 3 dispersed camping sites to parking areas to minimize impacts to soil and water resources. Install a sweet-smelling toilet and information board near the intersection of Forest Roads 127 and 145.
- Constructing 0.8 miles of road using new corridors and adding 7.7 miles of existing road to the Forest Service road system to provide access for proposed and future management activities.
- Harvesting of approximately 31.8 million board feet of timber from 2,547 acres of National Forest System lands in three entries.

The project area contains 13,851 acres of National Forest System lands located in Management Areas 2.2 and 3.0. The proposed action would implement the 2007 ANF Land and Resource Management Plan (or Forest Plan). This project does not contain any oil and gas development proposals. The analysis in this environmental assessment is tiered to the Final Environmental Impact Statement for the ANF Forest Plan.

An interdisciplinary team of resource specialists chose the initial treatment areas from an analysis of existing conditions within the project area. The team identified the need to manage individual stands within the project area in order to attain the desired condition listed in the Forest Plan. Management needs within the project area include establishing areas of young forest, improving stand conditions for optimum tree growth, improving forest structure, providing high quality hardwood timber, treating non-native invasive plant species, improving wildlife and aquatic habitat, and managing dispersed camping to reduce health, safety, and resource impacts.

A no action alternative (Alternative 2) and another action alternative (Alternative 3–The Branch) were considered in detail by the interdisciplinary team. The effects on implementing Alternative 1 as compared to the other alternatives are summarized in Table 2 on pages 20–25. The alternatives are described in Section II, Alternatives and the effects for each alternative are discussed in Section III, Environmental

Consequences. The action alternatives will meet the purpose and need and are consistent with the Forest Plan.

I. Purpose and Need for Action

Introduction

The Forest Service has prepared this environmental assessment (EA) in compliance with the National Environmental Policy Act (NEPA), according to the format established by the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] part 1500), Forest Service NEPA Procedures (36 CFR Part 220), the Appeals Reform Act of 1993 (ARA), and other relevant laws and regulations as part of the environmental analysis process for the Salmon West project. This EA discloses the potential direct, indirect, and cumulative effects that would result from implementing one of the action alternatives or the no-action alternative. Additional documentation regarding the environmental effects may be found in the project file (or planning record) located at the Marienville Ranger District office in Marienville, Pennsylvania.

Allegheny National Forest Land and Resource Management Plan

The Allegheny National Forest (ANF) Land and Resource Management Plan (LRMP or Forest Plan) (USDA-2007a) provides a 10 to 15 year strategy for managing forest resources on the ANF. All applicable laws, regulations, policies, and national and regional direction, as detailed in the Forest Service Manual and Handbook, are part of Forest Plan direction.

The Forest Plan is organized into four parts:

Part 1–Vision contains the forest niche statement, the desired condition of the ANF, and additional goals for the ANF;

Part 2–Strategy contains objectives, an estimate of management activities and funding, the allowable sale quantity, special designation, a summary of the management areas (MAs), suitable uses and activities, and monitoring strategy;

Part 3–Design Criteria contains forest-wide standard and guidelines; and

Part 4–Management Area Direction includes the contribution to the desired condition, objectives, suitable uses and activities, and standard and guidelines specific to each MA.

The Forest Plan is permissive in that it guides but does not mandate ANF projects and activities. Broader goals and objectives are realized through the development and completion of site-specific projects. The standards defined in the Forest Plan set parameters within which site-specific projects must take place. All projects must be consistent with these parameters (16 United States Code [USC] 1604[i]). If a project cannot be implemented in accordance with Forest Plan standards, the plan must be amended before the project can proceed (USDA-2007a, p. ROD-4).

Proposal, Needs, and Issues

Background and Overview of the Salmon West Project Area

The proposed 15,090-acre Salmon West project area is located on the Marienville Ranger District of the ANF, northwest of Marienville, Pennsylvania (see Map 1). It includes National Forest System (NFS) lands within Warrants 3183, 5101, 5104, 5105, 5106, 5107, 5267 in Howe Township; Warrants 3171 (Lots 12, 13, 14, 15, and 16), 3174 (Lots 50, 55, 56 and 58), 3179 (Lots 43, 44, 45, 46, 51, 52, 53, 54, 59 and 60), 3181 (Lot 37), 3183, 3191, 5110, 5129, 5136, 5137, 5138, 5139, 5140 and 5144 in Jenks Township and Warrants 5104, 5105, 5107, 5108, 5109, 5110, 5128, 5129, 5131, 5134, 5135, 5136, 5137, 5138 and 5269 in Kingsley Township, Forest County, Pennsylvania. This EA implements the Forest Plan and includes proposed

management activities that are designed to help achieve the desired condition described in the Forest Plan. All of the NFS lands within the project area lie within Management Area (MA) 2.2–Late Structural Linkages (4,892 acres) and MA 3.0–Even-aged Management (8,959 acres). See Section III, Environmental Consequences for a description of the existing condition.

Why here, why now. For the Salmon West project, stand data was reviewed using SILVAH (a computer program that provides silvicultural recommendations for stands based on data provided) to determine a pool of stands that would be looked at and reviewed for potential treatment. The following criteria were used to include stands in the pool for review.

- Potential thinning treatments were based on the relative stand density (relationship between the current stand density and maximum density that could occur at the same average tree size) being greater than 77 percent, effective stand age being less than 80 years, and average merchantable stand diameter being less than 16 inches in diameter at breast height (DBH).
- Potential shelterwood seed cut and removal treatments were based on the relative stand density being greater than or equal to 50 percent, effective stand age being greater than 80 years, and average merchantable stand diameter being greater than 16 inches DBH.
- Potential catastrophic shelterwood seed cut and removal treatments were based on the healthy relative stand density being less than or equal to 40 percent.

The interdisciplinary (ID) team examined the existing conditions in the project area, including conducting field surveys to identify specific concerns and opportunities. ID team meetings and district ranger direction dropped a number of stands from the stand pool. The following direction was given by the district ranger as side boards for this project.

- Not to harvest stands more than ¼ mile from an existing road.
- Not to manage (harvest timber or build roads) within unroaded area #53-Two Mile Run, which is located in MA 3.0.

Additional stands were dropped for other resource concerns, including:

- Cultural resource sites or concerns
- Steep slopes
- MA 2.2 stands already meeting current wildlife habitat needs
- On-going research projects

Following the filtering process, the remaining proposed stands were evaluated in the field during the summer of 2010 by the ID team. Following another filtering process during the fall of 2010, a group of stands needing treatment was carried forward and is included in the proposed action.

The oak stands in the project area have understories dominated by shade-tolerant and fire-susceptible species, which inhibits regeneration of oak. Given the disturbance-dependent nature of oaks, disturbance is needed to provide suitable conditions for oak regeneration. A combination of prescribed burning, site preparation, and scarification would provide the disturbance necessary to achieve oak regeneration and sustain oak forests types within the project area. Oak regeneration in mature stands is necessary to retain oak as a future forest type.

In the spring of 2010, a 65-acre wildfire occurred in unroaded area #53. The intensity of the fire varied and tree mortality is anticipated within the burned area.

Relationship to Other Documents

The analysis for this project is tiered to the Forest Plan Final Environmental Impact Statement (FEIS) (USDA-FS 2007b). The Forest Plan FEIS documents the effects of implementing various management options on the ANF.

Tiering is described in the Forest Service Handbook (FSH) 1905.15 as a process of summarizing and incorporating by reference other environmental documents of broader scope to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision (FSH 1909.15, chapter 42.1). An environmental impact statement (EIS) for a forest plan is an example of a "broad" EIS prepared for a program or policy statement. The Salmon West project is a project-level analysis. The scope of the Salmon West EA will be confined to addressing issues and possible environmental consequences of this project. It will not attempt to address decisions made at higher levels. However, it will implement direction provided at those higher levels and rely on the effects analysis included for activities proposed in this project unless stated by exemption.

The ANF Fiscal Year 2007 Monitoring and Evaluation Report is incorporated by reference. This report contains updates to information on forest health conditions and wildlife information. None of the items monitored in 2007 identified a need to amend the Forest Plan (USDA-FS 2008, p. 59).

Recent management project decisions within the project area include the Vegetation Management on Electric Utility Rights-of-Way FEIS and ROD (1997, the FY06 Regeneration EA (2006), the FY07 Regeneration EA (2009) and the Apple Tree Maintenance Categorical Exclusion (2009). These FEISs, EAs, and categorical exclusions have approved activities within the Salmon West project area that have not been fully implemented yet:

Vegetation Management on Electric Utility Rights-of-Way FEIS and ROD (USDA-FS 1997). The Vegetation Management on Electric Utility Rights-of Way project, approved in 1997, amended the 1986 Forest Plan and established direction for vegetation management on electric utility rights-of-way (ROW) on the ANF. It was both a programmatic (forest plan level) and a site specific analysis covering the use of herbicides and non-herbicide methods to achieve control of vegetation that interferes with the safe and effective operation of these facilities on the ANF. A total of 955 acres on rights-of-way (ROW) associated with 125 miles of electric utility line were covered by the FEIS. Approximate 1.7 miles of electric utility line ROW are located within the project area or along the project boundary.

FY06 Regeneration EA (USDA-FS 2006). The FY06 Regeneration project, approved in December 2006, was developed to improve the spatial arrangement of age classes in MA 3.0 and to complete regeneration sequences in stands with previously initiated regeneration treatments or were severely damaged by the July 2003 storm. Proposed treatments for stands 627018, reforestation only, including release, 25 acres in size; and 638044, overstory removal, including site preparation, herbicide application, tree shelters and planting, and release, 25 acres in size, which are located in the Salmon West project area, have not been completed yet. A consistency review was completed for the FY06 Regeneration EA in 2007 to ensure that these remaining activities are consistent with the direction in the revised 2007 Forest Plan and is incorporated by reference.

FY07 Regeneration EA (USDA-FS 2008a). The FY07 Regeneration project, approved in March 2009, was developed to improve the spatial arrangement of age classes in MA 3.0 and

to complete regeneration sequences in stands with previously initiated regeneration treatments or were severely damaged by the July 2003 storm. Initiate understory development and develop a more complex stand structure in MA 2.2. Proposed treatments for stands 635035, shelterwood seed cut/removal cut, including fence construction, herbicide application, site preparation, planting and release, 19 acres in size; 635040, reforestation only, including fertilizer application and release, 7 acres in size; and 635067, reforestation only, including fertilizer application and release, 8 acres in size, which are located in the Salmon West project area, have not been completed yet.

Apple Tree Maintenance Categorical Exclusion (USDA-FS 2009a). This decision approved release and pruning of approximately 5000 "wild" fruit trees scattered across the Marienville Ranger District. Implementation of this project is ongoing across the district as funding permits. There are 146 apple trees documented in the project area.

The Branch Stream Improvement Categorical Exclusion (USDA-FS 2013) has been proposed within the Salmon West project area and is currently being scoped for public comments. This proposal would involve constructing a multi-faceted log complex in The Branch to stabilize the stream bank and hill slope below Forest Road (FR) 145 in Warrant 5109, Kingsley Township, Forest County, Pennsylvania and improving (maintenance) 500 feet of FR145 above the multi-faceted log complex site.

Purpose and Need

The purpose of this project is to help achieve the desired condition in the Forest Plan (USDA-FS 2007a) for MAs 2.2 and 3.0 by responding to Forest Plan and MAs 2.2 and 3.0 goals and objectives. The project needs are:

- There is a need to create early structural habitat to provide diverse vegetation patterns across the landscape to represent well distributed habitats, a range of forest age classes and vegetative stages, a variety of healthy functioning vegetation layers, moderate to well stocked forest cover, and the variety of vegetation species or forest types necessary to achieve multiple resource objectives and sustain ecosystem health (USDA-FS 2007a, p. 14). Early structural habitat within the project area and across the region has been declining and has created a need to create young forest. Many treatments being proposed would create early-structural habitat through regeneration harvests.
- There is a need to regenerate or improve oak stands (USDA-FS 2007a, pp. 19, 20, and 109). There is a need to reintroduce fire into fire-adapted oak ecosystems to conserve regional biodiversity and sustain ecosystem structure and function (USDA-FS 2007a, p. 14). In the oak habitat, there is a need for management that should sustain oak mast crops and large den trees in the long-term (USDA-FS 2007a, pp. 15, 20 and 109).
- There is a need to provide diverse wildlife habitat across the landscape to provide forage and cover for a variety of wildlife species through habitat enhancements. To contribute to the conservation and enhancement of habitat integrity for species with viability concerns by protecting specific habitat elements crucial to the long-term sustainability of species to provide nesting sites, breeding areas, and young-rearing habitat free from human disturbance for species with viability concerns. There is a need to provide habitat for game species to make opportunities available for quality hunting and fishing experiences while promoting the management of game species that sustain healthy forest understories (USDA-FS 2007a, pp. 14 and 20).

- Non-native invasive plant (NNIP) species are established in the project area. There is a need to implement non-native invasive plant (NNIP) species treatments that would limit the introduction and/or spread of NNIP species, and conserve forest resources in a manner that presents the least hazard to humans and maintains or restores forest resources (USDA-FS 2007a, p. 13).
- There is a need to improve or restore dispersed campsites to reduce health, safety, and resource impacts (USDA-FS 2007a, p. 18)
- There is a need to manage Forest Service roads and expand stone pits to provide a safe, efficient, and economical transportation system that is responsive to public and administrative needs. There is a need to minimize adverse effects on ecological processes and ecosystem health, diversity, and productivity; and is in balance with needed management actions (USDA-FS 2007a, p. 16).
- There is a need to minimize potential soil erosion and sedimentation and long-term loss of inherent soil quality and function by maintaining, restoring, or improving soil quality, productivity, and function (USDA-FS 2007a, p. 14).
- A 1.4 mile section of Little Salmon Creek within the Salmon West project area is lacking large woody debris. About 0.5 miles of the banks of Salmon Creek (2000 feet) and The Branch (400 feet) are eroding due to dispersed camping. There is a need to maintain or restore watersheds and their associated stream and groundwater processes, channel stability, riparian resources, and aquatic habitats to a functional condition (USDA-FS 2007a, p. 14).
- Specific to MA 2.2 – There is a need to contribute to the desired condition by providing predominantly late structural forest habitat that links relatively large areas of older forest, or core areas, across the landscape. Vegetative management would provide complex late structural forest conditions and maintain mast-producing species (USDA-FS 2007a, pp. 109–112).
- Specific to MA 3.0 – There is a need to contribute to the desired condition by providing a mix of vegetative conditions and quality timber products that contribute to the local and regional economy. One of the objectives for MA 3.0 is to maintain 10 to 12 percent of the management area in early structural habitat. Currently, there are 526 acres (5.9 percent) of early structural habitat in MA 3.0 in the project area. Regeneration harvests, along with reforestation treatments would allow for the establishment of an early structural forest, which is characteristic of this management area and helps achieve the desired condition of a diversity of vegetation patterns across the landscape (USDA-FS 2007a, pp. 113-116).

Proposed Action

An interdisciplinary (ID) team has examined the existing condition within the project area, including field surveys to identify specific concerns and opportunities, and developed a site-specific proposal for natural resource management activities that help achieve the desired conditions for the MA 2.2 and MA 3.0 within the project area and respond to the purpose and need for action. Proposed timber harvest activities would include even-aged and uneven-aged management on 2,547 acres, about 18 percent of NFS lands within the project area.

It is assumed that the unfinished activities approved in FY06 Regeneration EA, FY07 Regeneration EA, and other decisions would proceed as planned. This includes shelterwood removals (44 acres), site preparation (44 acres), planting (44 acres), fencing or tree shelter

installation (44 acres), herbicide application (44 acres), fertilizer application (15 acres), and release for species diversity (84 acres).

Proposed **vegetation management activities** include:

- Even-aged management regeneration treatments, including shelterwood seed cuts and shelterwood removals, are proposed on 762 acres, delayed shelterwood removals, on 158 acres, delayed shelterwood seed cuts, on 175 acres, 3-stage preparation cut/shelterwood seed cut/shelterwood removal cut, on 273 acres, and 3-stage preparation cut/shelterwood seed cut/two-age removal cut, on 12 acres (10 percent of NFS lands in the project area). These treatments would be accompanied by reforestation activities, which could include site preparation, herbicide application, planting, fencing and installing individual tree shelters, fertilization, prescribed burning and/or scarification, and release to provide and maintain age class and species diversity. The maximum number of reforestation treatments are proposed for each given treatment area, with many of the treatments occurring on the same piece of ground. If available, American chestnut may be planted along with other hardwood and conifer species.
- Uneven-aged management regeneration treatments, including single tree/group selections, are proposed on 275 acres, and a group selection is proposed on 3 acres. These treatments would be accompanied by reforestation activities, which could include site preparation, herbicide application, planting, fencing and installing individual tree shelters, prescribed burning and/or scarification, and release to provide and maintain age class and species diversity. The maximum number of reforestation treatments are proposed for each given treatment area, with many of the treatments occurring on the same piece of ground.
- The amount of reforestation treatments proposed and those actually implemented may not end up being the same. For example, while fencing is proposed as an option for 60 stands (1,381 acres), the number of stands that will be fenced would likely be less. Management of the deer herd in recent years has been successful in reducing average deer densities. However, since deer densities are not evenly distributed across the ANF, there is a need to allow for management of site-specific deer browsing impacts. In recent years, we have installed fencing, on average, on less than 25 percent of those stands for which it was originally proposed. Herbicide application is proposed for 1,898 acres to reduce dense interfering vegetation for natural regeneration and to enhance species diversity and forest health. It is anticipated that herbicide would be applied to nearly all of these acres proposed for treatment.
- Intermediate thinning is proposed on 877 acres (6 percent of NFS lands in the project area) to promote stand health, growth, vigor, and diversity of overstocked stands where competition between trees is causing poor growth and reduced health. Five stands (633016, 634015, 634016, 634018 and 634021) in MA 2.2 are proposed for intermediate thinning to accelerate development of mature forest conditions in MA 2.2. Specifically, this treatment is designed to more rapidly develop larger trees and woody debris while increasing structural diversity by introducing canopy gaps and greater variation in overstory tree stocking.
- Forest health activities include release on 2,338 acres to increase or maintain species diversity and promote tree growth. The need for release will be determined following implementation of the final harvests and associated reforestation treatments. Fewer acres may be treated than proposed depending on the regeneration that develops.
- Grapevine control is proposed on 329 acres to allow trees to grow freely.

Changes to proposed action since scoping: Stands 628045 and 628055 have been dropped from the proposed action. These stands were originally proposed for a delayed shelterwood seed cut/shelterwood removal and delayed overstory removal, respectively. Further field review showed that managing these stands at this time would not economically support the road construction needed to manage these stands. Stand 633024 has been dropped from the proposed action. It was originally proposed for intermediate thinning based on silvex data and a SILVAH recommendation. Further field review showed that managing this stand at this time would not economically support the road construction needed to manage this stand. Dropping these three stands results in a reduction in the amount of delayed shelterwood seed cut/shelterwood removal from 214 acres to 175 acres (39 acres), delayed overstory removal from 162 acres to 159 acres (3 acres), and intermediate thinning from 900 acres to 877 acres (23 acres) in the proposed action.

In order to improve wildlife habitat within the project area, the following **wildlife habitat improvements** are being proposed.

- Planting native trees and shrubs to provide future food and cover for wildlife and for species diversity on approximately 59 acres. Fencing or tree shelter installation is being proposed on 17 acres to protect planted or existing trees and shrubs.
- Installing 51 wildlife structures to provide nesting, roosting and basking opportunities for cavity dwellers and other wildlife.
- Restoring or rehabilitating 49 acres of existing herbaceous openings (liming, disking, prescribed burning, applying herbicide and fertilizer, seeding, and mulching to enhance wildlife habitat.
- Reclaim 29 acres stone pits to create herbaceous openings (liming, disking, applying fertilizer, seeding and mulching) to enhance wildlife habitat.
- Releasing fruit bearing trees and shrubs that produce mast on 7 acres to enhance wildlife habitat.
- Manage 9 acres to maintain healthy vigorous aspen clones to enhance wildlife habitat.
- Fell up to 35 trees (large wood introductions) per mile would be felled into the stream or onto the floodplain along 1.4 miles of Little Salmon Creek to improve aquatic habitat diversity, trap sediment, and slow flood flows. Trees within 10 feet of the high water mark of the stream channel would not be cut. Trees would only be felled where large woody debris is lacking and trees are available to be felled without reducing stream side shading.

Changes to proposed action since scoping: Two stone pits (stands 632013 and 640080) were dropped from the wildlife proposal to be reclaimed and create herbaceous openings. Stand 632013 (1 acre) is not an open stone pit. Stand 640080 (1 acre) has been reclaimed and an oil and gas tank battery now occupies the site.

Thirty-one (31) NNIP species have been documented along roads and streams and within stands and stone pits in the project area. One hundred eighty-eight (188) acres of NNIP species treatments are being proposed through a combination of manual, mechanical, and chemical control based on site, species, size of infestation, reproductive stage, or need for multiple treatments within a growing season or over a course of several years. Not all NNIP species or infestations within the project area would be treated. For example, coltsfoot, which is commonly found along road corridors and disturbed areas, would not be prioritized for treatment unless it is

invading a Regional Forester Sensitive Plant Species (RFSS) habitat (USDA-2007a, Appendix A, pp. A-43–A-44). Additional NNIP species or infestations may be documented within the project area during implementation; additional NNIP species treatments for ANF NNIP species of concern would follow appropriate Forest Plan direction.

Management of dispersed campsites is necessary to protect soil and watershed conditions along Salmon Creek and The Branch. There is a need to define parking areas on five dispersed camping sites: two along FR127 and three along FR145 and expansion of a parking area off of FR127. A sweet-smelling toilet (SST) is being proposed for installation near the intersection of FR127 and FR145 to help alleviate human waste problems caused by dispersed camping. An information bulletin board would be installed near the SST and the parking area expanded. Seven dispersed camping sites off of FR127 and twenty-eight sites off of FR145 are proposed to be closed and rehabilitated because their use is causing soil and water concerns or because they are in the middle of the North Country National Scenic Trail. Pathway improvements (treadway and steps) are being proposed on eight sites to provide more stable access to these sites and to Salmon Creek and The Branch. Some existing sites would be converted from roadside camping to parking areas providing access one or two other campsites or provide for day-use fishing. Camping along the Salmon Creek and The Branch would be limited to designated sites, and no new user-created sites would be permitted.

Changes to proposed action since scoping: On Forest Road 145 five sites missed in the original survey were added to the inventory. Three sites are proposed to be improved. Two missed sites are proposed to be closed. Two sites proposed to be closed have been re-evaluated and are now proposed for improvement. One site proposed to be improved is now proposed to be close due to resource concerns. One camp site is proposed for closure while its parking area will be kept for day-use.

In-stream log structures are proposed for installation along 2,000 feet of Salmon Creek and 400 feet of The Branch. These structures will be placed at locations which will help stabilize eroding banks caused by dispersed campsites. The locations are adjacent to recreation proposals for dispersed camping sites. These structures would also improve aquatic habitat and would be constructed following the PA Fish and Boat Commission 2007 guidebook for "Habitat Improvement for Trout Streams". The structures will be created primarily with logs and root wads using heavy equipment. The logs and root wads will be delivered to these sites from off-site locations. Some rock will also be incorporated for stabilization.

Changes to proposed action since scoping: In-stream log structures are an addition to the proposed action as a method of addressing resource concerns.

To provide access for proposed and future management activities, 8.3 miles of road construction are needed with 7.7 miles of road construction on existing corridors and 0.8 miles requiring new corridors. Approximately 0.3 miles of Forest Service system roads are proposed for decommissioning and 3.6 miles of non-system roads are proposed for decommissioning. Two changes in road management (open, closed, or restricted) are being proposed. To promote isolation within MA 2.2, 1.6 miles of currently open road is proposed to be changed to restricted. To allow access for hunters to help manage the deer herd so that diverse forest understories may develop, 2.6 miles of closed road is proposed to be changed to restricted.

Changes to proposed action since scoping: The road construction–new corridor portion of FR212D and FR216E and the road construction–existing corridor of FR216E have been dropped from the proposed action due to economic concerns. Due to resource concerns, proposed road construction–new corridor has been dropped and new access (road construction–new corridor) from FR216 is being proposed. The new access road is FR216E, see Map 3. A road construction–new corridor segment was shown on the scoping maps along FR 361. This was an error; no road construction–new corridor is being proposed at this location. The short road segment beside it was proposed for decommissioning and it has been dropped from the proposed action. FR180G was proposed to be added to the Forest road system. This was an error; FR180G already exists. The road to be added to the Forest Service road system would be FR180K. In the scoping letter, the proposed realignment of FR145 has been dropped from the proposed action due to resource concerns.

- Stone will be needed for road maintenance (spot surfacing) and construction of Forest Service system roads. To provide stone, 10 existing stone pits within or near the project area are being proposed for horizontal and/or vertical expansion (6.5 acres). Following expansion, all ten pits will be rehabilitated and stabilized until needed again.

Changes to proposed action since scoping: The FR212 stone pit was dropped from the proposed action because it is a wildlife opening, not a stone pit. The FR165 pit was dropped from the proposed action because it has already been approved for expansion in the Ritts Salvage EA. The FR216A pit has been dropped from the proposal because it is no longer a stone pit. It is now a well site. The FR361 (3) pit was dropped from the proposed action due to a resource concern and vertical expansion is not feasible at this time. The FR361 (1), FR399, FR399A (1), FR399A (2), FR561A and FR577 pits were dropped from the proposed action because during the summer of 2011 they were tested and no or low quality stone was found. The FR540A pit was also tested during the summer of 2011 and limited quantities of stone were found. However, due to its location near private property boundary and the limited amount of stone found, it was dropped from the proposed action.

The proposed activities for Alternative 1 are summarized in Table 1 and displayed on the attached maps. More site-specific information on the proposed action and list of stands in each category can be found in Appendix B.

Table 1–Activities proposed in Alternative 1–Proposed Action

Vegetation Management (acres)		
Even-aged Treatments		
Intermediate thinning (commercial)		681
Shelterwood seed cut (1st entry)/shelterwood removal (2nd entry) for non-oak management		762
Delayed shelterwood seed cut (2nd entry)/shelterwood removal (3rd entry) for non-oak management		175
Overstory removal		158
Preparation cut (1st entry)/shelterwood seed cut (2nd entry)/shelterwood removal (3rd entry) for oak management (temporary openings will be less than 20 acres in MA 2.2 or less than 40 acres in MA 3.0)	MA 2.2	33/33/20
	MA 3.0	253/253/253
Preparation cut (1st entry)/shelterwood seed cut (2nd entry)/two-aged removal (3rd entry) for oak management in MA 2.2		12
Uneven-aged Treatments		
Single tree selection/group selection	MA 2.2 Non-oak management	75
	MA 2.2 Oak management	200
Group selection		3
Intermediate thinning		196
Understory Vegetation Treatments (acres)		
Site preparation		1,703
Herbicide–reforestation		1,898
Prescribed burning and/or scarification		525
Fence construction (optional)		1,381
Fertilization		404
Tree planting for species diversity		148
Release for species diversity		2,338
Grapevine control		329
NNIP species treatments (herbicide and manual)		188
Wildlife Habitat Management		
Wildlife structure installation (number)		51
Planting (acres)		59
Fencing (acres)		17
Shrub/Mast release (acres)		7
Aspen management (acres)		9
Opening enhancement for existing herbaceous opening, includes herbicide application, prescribed burning, etc. (acres)		49
Reclaim stone pits as herbaceous openings. No trees to be planted (acres)		29
Recreational Improvements		
Improve dispersed camping sites (number)		19
Close dispersed camping sites (number)		35
Convert to parking only (number)		3
Install Sweet-Smelling Toilet and information board		1
Install in-stream structures (feet)		2,400

Watershed Management (miles)	
Large wood introductions (35 trees/mile) (miles)	1.4
Travel Management (miles)	
Road construction (new corridor)	0.8
Road construction (existing corridor)	7.7
Forest Service System Road decommissioning	0.3
Non-System Road decommissioning	3.6
Area cleared in existing stone pits (number of pits/acres)	10/6.5
Road management change from open to restricted (FR180A) (miles)	1.6
Road management change from closed to restricted (FR212 and FR216A) (miles)	2.6

Decision to be Made

The purpose of this EA is to provide the responsible official, the Marienville District Ranger, with sufficient information and analysis to make an informed decision about the project in response to the purpose and need for action. The responsible official will also consider public input to the EA to decide the following:

1) What management activities to select, if any, to help achieve the desired conditions identified in the Forest Plan.
2) What site-specific mitigations to select, if any, to minimize environmental effects of any selected management activities.
3) Whether the proposed action proposes any significant environmental impacts to warrant the need to prepare an EIS.

This project does not require any amendments to the Forest Plan. A decision on this project is expected by April 2013. All proposed treatments would be implemented within 20 years.

Public Involvement

This proposal was first listed in the ANF schedule of proposed actions (SOPA) in April 2011. This quarterly publication is mailed to interested parties and is available on the ANF website. On March 11, 2011, a scoping proposal explaining the purpose and need for action, as well as the locations and types of proposed activities, was mailed to 180 individuals and organizations, including those who have expressed a desire to be notified about current projects, subsurface mineral owners, and adjacent landowners. On March 14, 2011, a news release announcing the opening of the scoping period was sent to local newspapers and members of the media and the scoping package was also posted on the ANF website.

Forty-six (46) responses to scoping were received before the end of the scoping period. Seven (7) responses were received after the scoping period. The comments are summarized in Appendix A– Scoping Comment Summary. Comment letters are part of the project record (located at the Marienville Ranger District office). Comments were reviewed by the responsible official and the ID team to identify issues and determine if additional alternatives would be needed. Section II, Alternatives explains the results.

Scoping comment issues were separated into two groups: unresolved and resolved. Unresolved issues are used to formulate alternatives, prescribe mitigation measures, or analyze environmental effects. Issues are "unresolved" because the extent of their geographic distribution, the duration of their effects, or the intensity of interest or resource conflict. Resolved issues are identified as those: (1) outside the scope of the proposed action; (2) already decided by law, regulation, Forest Plan, or other higher level decision; (3) irrelevant to the decision to be made; or (4) conjectural and not supported by scientific or factual evidence.

The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Section 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Section 1506.3)…" A list of resolved issues and reasons regarding their categorization as resolved may be found in Appendix A– Scoping Comment Summary.

One unresolved issue was identified from the comments received from scoping.

1. "Marcellus shale drilling, conventional drilling and extensive clearcutting on the private in-holdings southeast of the stands identified for "treatment" in and along The Branch (Stands in Warrants 5182, 5101, 5104, 5105, 5108, 5109) will add to the extensive stress on the ecosystem in Warrants 5102, 5103, 5106, and 5107 caused by logging and oil and gas drilling (both on private and ANF lands). … Changing the nature of the Branch would be a shame. The area must be protected."

Since the creation of temporary openings can decrease and fragment potential interior wildlife habitat and areas for solitude, the Indicator Measure (IM) for this unresolved issue will be habitat fragmentation and includes the following variables: change in the number of patches, mean patch size (acres), total edge (miles), and total core area (acres) (IM-4).

The Forest Service is consulting with the Pennsylvania Historical and Museum Commission (State Historic Preservation Office) and the Seneca Nation of Indians Tribal Historic Preservation Office (THPO) in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended in 1980 and 1992, and the regulations (36 Code of Federal Regulations Part 800) of the Advisory Council on Historic Preservation. All proposed management activities in this project are being reviewed by both of these agencies for potential effects to cultural resources.

II. ALTERNATIVES

Introduction

This section describes and compares the alternatives considered for the Salmon West project. NEPA directs the Forest Service to use an interdisciplinary approach that will ensure the integrated use of natural and social sciences and the environmental design arts (Section 102 [42 USC Section 4332]). The proposed action (Alternative 1) was developed by an ID team to respond to the purpose and need for action. Alternative 3 was developed to address the significant issue identified during scoping. Six other alternatives were proposed by the public during scoping. Of the nine alternatives considered, six were eliminated from detailed study because they failed to meet the purpose and need of the project. Three alternatives are analyzed in detail in this document: the proposed action (Alternative 1), the no action alternative (Alternative 2), and The Branch alternative (Alternative 3).

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate a range of reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not considered in detail (40 CFR 1502.14). The following alternatives were considered but were eliminated from detailed study as explained below.

An alternative to manage the forest for climate change. This alternative was considered but eliminated from detail study because implementing the Forest Plan provides for maintaining a diversity of plant and animal communities that will enhance the resiliency of the forest to respond to these changing conditions. Both of the action alternatives would enhance the resiliency of the forest by providing diverse vegetation patterns across the landscape to represent well-distributed habitats, a range of forest age classes and vegetative stages, a variety of healthy functioning vegetation layers, moderate-to-well stocked forest cover, and the variety of vegetation species and forest types necessary to achieve multiple resource objectives and sustain ecosystem health (USDA-FS 2007a, p. 14).

An alternative that maintains or increases the level of dispersed camping areas in this popular recreation area. This alternative was considered but eliminated from detailed study because it duplicates an alternative (maintaining the current level of dispersed sites) already being considered or cannot be implemented (increasing the number of dispersed sites). The no action alternative (Alternative 2) would maintain the current number of dispersed camping areas in the project area. The Salmon West interdisciplinary team was unable to identify any new areas suitable for sustainable dispersed camping along Salmon Creek or The Branch.

An alternative that does not use even-aged management practices, expand stone pits, apply herbicides, construct fences, or involve prescribed burning or the construction or reconstruction of roads. This alternative was considered but eliminated from detailed study because it does not meet the purpose and need for the project, which includes improving the spatial arrangement of age classes in MA 3.0 and restoring and maintaining forest health throughout the project area. An alternative that does not include the activities listed above and associated activities from the proposed action would resemble the no action alternative. The no action alternative (Alternative 2) is responsive to this concern.

An alternative in which all of the proposed treatments in MA 2.2 are dropped. This alternative was considered but eliminated from detail study because it would not meet the purpose and need of the project, which include regenerating and improving oak stands, providing diverse

wildlife habitat across the landscape, treating NNIP species within MA 2.2, and providing predominately late structural forest habitat. An alternative in which all the treatments in MA 2.2 are dropped would include the proposed activities on scoping maps 2, 3, 4, and 5 that are in MA 3.0.

An alternative that would offset the impacts of oil and gas drilling by reducing Forest Service actions. This alternative was considered but eliminated from detailed study because it does not meet the purpose and need for the project. Project proposals were designed primarily to meet the objectives for MA 2.2 and 3.0, which include improving the spatial arrangement of age classes in MA 3.0, restoring and maintaining forest health throughout the project area, and the need to regenerate and improve oak stands.

OGD operators are required to develop and implement soil erosion and sedimentation plans for their developments. These plans outline BMPs used to minimize soil erosion and sedimentation. The Forest Service (ANF) works cooperatively with oil and gas operators to reduce or eliminate impacts to surface resources. Potential cumulative effects from OGD within the project area, including reasonably foreseeable future effects, would be analyzed along with Forest Service proposals. The no action alternative is responsive to this concern.

An alternative that restores watersheds and maintains or increases species viability. All Forest Service (ANF) proposals would follow Forest Plan standards and guidelines (USDA-FS 2007a), which meet or exceed Pennsylvania BMPs and would minimize impacts to riparian areas, water quality, and water quantity. When future projects are proposed, project analysis and design would consider the combined impacts from OGD and other proposed ANF management activities. The proposed action includes wildlife habitat improvements, stream improvements, and restoring and maintaining forest health throughout the project area. None of the proposed actions are likely to cause a trend toward federal listing determination or loss of species viability for any federally listed threatened or endangered species, Regional Forester's sensitive species (RFSS), or species with a viability concern on the ANF.

An alternative that drops all treatments adjacent to, or in the headwaters of, Salmon Creek, Little Salmon Creek, Four Mile Run, Two Mile Run, Guiton Run, Lamentation Run, Mud Lick Run, and The Branch. This alternative was considered but eliminated from detailed study because it would not meet the purpose and need on the project and would also be duplication an alternative within the existing range of alternatives considered in detail. This alternative was displayed using GIS where all proposed timber harvests and other vegetation management treatments that had Forest Plan stream buffers (USDA-FS 2007a, pp. 74–76) fall within their proposed treatment areas were dropped from the proposed action. The resulting alternative would have 105 acres of intermediate thinning (an 88 percent reduction), 397 acres of even-aged regeneration harvests (a 68 percent reduction), 36 acres of uneven-aged management (single tree selection/group selection) (an 87 percent reduction), and 83 acres of oak management (an 83 percent reduction) along with a reduction in associated reforestation treatment over three entries. The map of this GIS analysis is located in the project file. However, additional acres from the remaining treatments of this alternative would also be dropped as portions of these stands lie within headwaters of streams but not within Forest Plan stream buffers. Once this is done, this alternative would be similar to the Alternative 2 (the no action alternative) and fall between Alternatives 2 and 3.

In addition, project proposals were designed primarily to meet the objectives for MA 2.2 and MA 3.0, which includes improving the spatial arrangement of age classes in MA 3.0, restoring and maintaining forest health throughout the project area, and the need to regenerate and improve oak

stands. All Forest Service (ANF) proposals would follow Forest Plan standards and guidelines, which would minimize impacts to riparian areas of headwater streams, water quality, and water quantity. This direction also meets or exceeds Pennsylvania BMPs. All headwater streams and riparian areas would be avoided during commercial activities through buffers, such as 100 feet buffers along perennial streams and wetlands and 50 feet plus 4 feet for each percent of slope along intermittent streams. The project analysis and design also reviewed basal area reductions to ensure they are less than 25 percent in watersheds. This would keep vegetation management activities from having measureable changes to water quantity levels. Cumulative effects will also consider the combined impacts from vegetation management activities, other ANF activities, and OGD. This project would also disperse vegetation management treatments over the project area and avoid concentrating treatments in the headwaters of these streams.

Alternatives Analyzed in Detail

The following alternatives were considered in detail.

Alternative 1 (Proposed Action)

This alternative is described on pages 4–10 and in Appendix B. Remaining Forest Service approved activities in FY06 and FY07 Regeneration EA's and other projects (pp. 2–3) would occur, including shelterwood seed cut/removal cut (19 acres), overstory removal (25acres), site preparation (44 acres), planting (44 acres), fencing or tree shelter installation (44 acres), herbicide application (44 acres), fertilizer application, (15 acres), and release for species diversity (84 acres).

Alternative 2 (No Action)

The proposed action would not occur at this time. Proposed timber harvests, reforestation treatments, NNIP species treatments, wildlife habitat improvements, road construction, stone pit expansion, and soil and water restoration activities would not occur under this alternative. Remaining Forest Service approved activities in the FY06 and FY07 Regeneration EA's and other projects (pp. 2–3) would occur, including shelterwood seed cut/removal cut (19 acres), overstory removal (25 acres), site preparation (44 acres), planting (44 acres), fencing or tree shelter installation (44 acres), herbicide application (44 acres), fertilizer application, (15 acres), and release for species diversity (84 acres). Routine maintenance activities would occur based on available resources and funding.

Alternative 3 (The Branch)

This alternative was developed to address the unresolved issue identified from scoping. Under this alternative, there would be no commercial timber harvesting in Warrants 5101, 5104, 5105, 5108, 5109 and 5282. This alternative includes all of the activities proposed in Alternative 1, except for the following stands: 629036, 630004, 630008, 630034, 630037, 630065, 630066, 631017, 632008, 632012, 632030, 632036, 632056, 636017, 636027, 636035, 636053, 636064, 636067 and 636068 (These stands are highlighted in Table B-1 in Appendix B). Dropping these stands results in a reduction of 493 acres of timber harvests (155 acres intermediate thinning, 264 acres of even-aged regeneration, including associated preparation cut, shelterwood seed cuts and reforestation treatments, and 74 acres of uneven-aged regeneration, including associated single-tree selection cuts and reforestation treatments). This would also result in less timber harvested (approximately 6.3 MMBF less than in Alternative 1).

Remaining Forest Service approved activities in the FY06 and FY07 Regeneration EAs and other projects (pp. 2–3) would occur, including shelterwood seed cut/removal cut (19 acres), overstory removal (25 acres), site preparation (44 acres), planting (44 acres), fencing or tree shelter

installation (44 acres), herbicide application (44 acres), fertilizer application, (15 acres), and release for species diversity (84 acres).

Table 2–Activities proposed in Alternative 3–The Branch

Vegetation Management (acres)		
Even-aged Treatments		
Intermediate thinning (commercial)		524
Shelterwood seed cut (1st entry)/shelterwood removal (2nd entry) for non-oak management		590
Delayed shelterwood seed cut (2nd entry)/shelterwood removal (3rd entry) for non-oak management		174
Overstory removal		123
Preparation cut (1st entry)/shelterwood seed cut (2nd entry)/shelterwood removal (3rd entry) for oak management (temporary openings will be less than 20 acres in MA 2.2 or less than 40 acres in MA 3.0)	MA 2.2	33/33/20
	MA 3.0	199/199/199
Preparation cut (1st entry)/shelterwood seed cut (2nd entry)/two-aged removal (3rd entry) for oak management in MA 2.2		12
Uneven-aged Treatments		
Single tree selection/group selection	MA 2.2 Non-oak management	0
	MA 2.2 Oak management	200
Group selection		3
Intermediate thinning		196
Understory Vegetation Treatments (acres)		
Site preparation		1,365
Herbicide–reforestation		1,560
Prescribed burning and/or scarification		453
Fence construction (optional)		1,096
Fertilization		319
Tree planting for species diversity		125
Release for species diversity		2,000
Grapevine control		287
NNIP species treatments (herbicide and manual)		188
Wildlife Habitat Management		
Wildlife structure installation (number)		51
Planting (acres)		39
Fencing (acres)		17
Shrub/Mast release (acres)		7
Aspen management (acres)		9
Opening enhancement for existing herbaceous opening, includes herbicide application, prescribed burning, etc. (acres)		49
Reclaim stone pits as herbaceous openings. No trees to be planted (acres)		29

Recreational Improvements	
Improve dispersed camping sites (number)	19
Close dispersed camping sites (number)	35
Convert to parking only (number)	3
Install Sweet-Smelling Toilet and information board	1
Install in-stream structures (feet)	2,400
Watershed Management (miles)	
Large wood introductions (35 trees/mile) (miles)	1.4
Travel Management (miles)	
Road construction (new corridor)	0.8
Road construction (existing corridor)	6.9
Forest Service System Road decommissioning	0.3
Non-System Road decommissioning	3.6
Area cleared in existing stone pits (number of pits/acres)	7/5.0
Road management change from open to restricted (FR180A) (miles)	1.6
Road management change from closed to restricted (FR212 and FR216A) (miles)	2.6

Design Features for Action Alternatives

The proposed activities in Alternatives 1 and 3 have been designed to be implemented in accordance with Forest Plan forest-wide, MA 2.2 and MA 3.0 standards and guidelines (USDA-FS 2007a). Design features are highlighted applications of the Forest Plan standards and guidelines. In some cases, the standards and guidelines provide options for how they may be applied. A design feature clarifies, where necessary, how these standards and guidelines may apply to specific activities in the proposed action.

Project design features for the proposed action include:

Soil and Water

- On those portions of each stand with group II and III soils, cutting and skidding are permitted during dry or frozen conditions or during the entire normal operating season using equipment meeting low ground pressure requirements **(USDA-FS 2007a, p. 74).**
- Surface armoring (at stream crossings) shall be applied on planned timber haul routes prior to timber hauling **(USDA-FS 2007a, p. 75).**

NNIP species

- Noxious weed and invasive plant surveys shall be conducted prior to stone pit expansion **(USDA-FS 2007a, p. 53)**.
- In order to reduce the potential for introduction or spread of NNIP species, an equipment cleaning provision is included in timber sale and other contracts **(USDA-FS 2007a, p. 53)**.

Wildlife and Regional Forester Sensitive Species

- In **stands 640031, 640091, and 640032**, reserve and protect all known apple trees, crabapples, and native shrubs. If any of these components are discovered during implementation in other stands, reserve and protect **(USDA-FS 2007a, p. 80)**.
- In all stands where grapevine is managed, maintain grapevine within the stand in small

patches to ensure its component is present on the landscape **(USDA-FS 2007a, p. 80)**.

- In **stand 628054**, protect lone American chestnut tree along the northern portion of stand just outside the stand border when implementing silvicultural prescription **(USDA-FS 2007a, p. 80)**.
- White pine and eastern hemlock will not be felled or damaged during implementation of large woody debris introductions into streams **(USDA-FS 2007a, p. 80)**.
- In proposed wildlife opening rehabilitations, protect existing apple trees, native shrubs, fences, and other wildlife structures. In addition, field surveys shall be accomplished before implementation to protect wildlife that may be currently utilizing the opening **(USDA-FS 2007a, p. 80)**.
- During construction for FR216E, protect, as much as possible, the known round leaf orchid population **(USDA-FS 2007a, p. 80)**.
- During stone pit rehabilitation in **stand 631029,** habitat integrity for the coal skink shall be maintained by avoiding disturbance to rubble or boulder field in the center of the pit **(USDA-FS 2007a, p. 87)**.
- In all non-commercial release treatments, particularly those within the 1985 tornado swath, retain all aspen, apple, woody shrubs, and other mast producing trees such as oak and cucumber **(USDA-FS 2007a, p. 80)**.
- In **stand 636036**, protect diverse fungus field in eastern portion of stand by not skidding timber from stands 636017 or 636067 through this fungus field **(USDA-FS 2007a, p. 80)**.
- In **stand 636025,** remove old fence mounting gadgets manually or fell small trees with fencing attached.
- In **stands 620043 and 620062** (stone pit development), protect large whorled pogonia during expansion **(USDA-FS 2007a, p. 80)**.
- In **stand 636068**, reserve raptor nest tree and monitor for use before implementation **(USDA-FS 2007a, p. 80)**.
- Include/emphasize rock and boulder complexes in reserve areas in **stands 623041, 624008, 624015, 624020, 624029, 627012, 628028, 628037 628039 628040, 628045, 628046, 628060, 629036, 631017, 633010, 633020, 633024, 633045, 634005 634016, 634015, 634018, 634021, 634022, 635022, 636017, 638032, 638046, 636060, and 636068.**
- In stands **623041, 624008, 624015, 624020, 624021, 624028, and 624029,** prescribed burning will be conducted prior to the cerulean warbler's arrival in the spring.

Heritage

- Site-specific heritage design features are not listed due to the confidential nature of the information. Standards and guidelines for heritage resources are listed in the Forest Plan. Appropriate heritage resource personnel will be contacted prior to formalizing any sale or implementation contract or other resource treatments involving ground disturbing activities to include any design features to heritage sites in contracts or agreements **(USDA-FS 2007a, p.62).**
- In any contract or agreement, the following statement will be included, as appropriate: If any previously unknown or unrecorded sites are found during project implementation, any ground disturbing activity will cease and the appropriate heritage resource personnel notified. A heritage resource specialist will evaluate the situation and determine the proper course of action **(USDA-FS 2007a, p. 62).**

Scenery and Recreation

- Along Concern Level (CL) 1 or CL2 travelways, North Country National Scenic Trail (NST), Allegheny Snowmobile Loop (ASL), leave ¼ acre buffer areas or feather edges of openings, as needed **(Stands 627017, 627019, 627020, 631013, 631017, 633002, 633003, 633016,**

633042, 633045, 634001, 634005, 634015, 634018, 634020, 634021, 634022, 634022, 635008, 635048, 635050, 638009, 638022, 638025, 638031, 638032, 638035, 638037, 638042) (USDA-FS 2009b, pp. 7– 8).

- Landings shall incorporate screening when viewed from a Concern Level (CL) 1 or CL2 travelways and be rehabilitated to mimic natural openings **(Stands 627017, 627019, 627020, 631013, 631017, 633002, 633003, 633016, 633020, 633042, 633045, 634001, 634005, 634015, 634018, 634020, 634021, 634022, 634022, 635008, 635048, 635050, 638009, 638022, 638025, 638031, 638032, 638035, 638037, 638042) (USDA-FS 2009b, pp. 7–8)**.
- Along ASL and North Country NST, slash shall be pulled back 50 feet from the edge of the road or trail, and for an additional 50 feet, slash shall be lopped and scattered to a depth of 3 feet. Treatment should be accomplished within one year of harvesting **(Stands 627017, 627019, 627020, 630001, 630002, 631013, 631017, 633001, 633002, 633003, 633016, 633020, 633042, 633045, 634001, 634005, 634015, 634018, 634020, 634021, 634022, 635008, 635048, 635050, 638009, 638022, 638025, 638031, 638032, 638035, 638037, 638041, 638042) (USDA-FS 2009b, pp. 7–8)**.
- In **stands 627020, 633045, 634020, 634022, 635008, 635048, 635050** stumps within 50 feet and seen from a CL1 travelway, North Country NST, shall be chisel cut with the face oriented away from the road, trail, or stream or flush cut **(USDA-FS 2009b, p. 7–8).**
- Cutting and skidding is prohibited within 200 feet of the ASL during the established Allegheny National Forest snowmobile season, NCNST, Forest Road 145, and State Route 3004 on weekends and legal holidays. Safety signs must be placed along the ASL, NCNST, FR145, and State Route 3004 roads and trails when operating within 200 feet of the them **(Stands 627017, 627019, 627020, 631013, 631017, 633002, 633003, 633016, 633020, 633042, 633045, 634001, 634005, 634015, 634018, 634020, 634021, 634022, 635008, 635048, 635050, 638009, 638022, 638025, 638031, 638032, 638035, 638037, 638042) (USDA-FS 2007a, p. 60)**.
- No **hauling** on **FR127, FR145, FR180, FR216 and FR287 (ASL)** during the established snowmobile season on the ANF on weekends and legal holidays **(USDA-FS 2007a, p. 60).**
- **Snowplowing** of designated snowmobile routes **(FR127, FR145, FR180, FR216 and FR287)** shall be done as to leave an adequate snow mat (3 inches) for grooming, snowmobile operation and road surface protection (Contract Clause [CT] #5.33 Snow Plowing). Commercial and administrative vehicle traffic shall run with their headlights on during the established snowmobile season **(USDA-FS 2007a, p.61).**

Comparison of Effects by Alternative

Forest Plan standards and guidelines are incorporated into the analysis of Alternative 1–Proposed Action and Alternative 3–The Branch, presented in Section III, Environmental Consequences. Previously approved activities that have not been implemented yet are considered in cumulative effects for all alternatives in Table 3, which provides a brief comparison of the effects disclosed in Section III, Environmental Consequences.

Table 2–Summary of cumulative effects of implementing Alternative 1–Proposed Action as compared to Alternative 2–No Action and Alternative 3– The Branch

Resource/Effects Analysis Framework	Alternative 2–No Action	Alternative 1–Proposed Action	Alternative 3–The Branch
Soils (see Section III, pp.39–42)	Soil disturbance would occur on less than 15 percent of each harvest area (up to 6.6 acres total) (from remaining FY06 and FY07 Regeneration units). Temporary soil disturbance would occur during associated reforestation activities and road maintenance (16.4 miles). Previously approved fertilization may occur on 15 acres. Proposed road construction or stone pit expansion would not occur.	Soil disturbance would occur on less than 15 percent of each harvest area (up to 388.8 acres total). Temporary soil disturbance would occur during associated reforestation activities, road maintenance (up to 39.5 miles), and road construction (8.5 miles). Fertilization of 419 acres may decrease the availability of base cations in soils (e.g. calcium and magnesium). Loss of long-term soil productivity from road construction–new corridor and stone pit expansion would occur (up to 9.9 acres).	Soil disturbance would occur on less than 15 percent of each harvest area (up to 314.7 acres total). Temporary soil disturbance would occur during associated reforestation activities and road maintenance (up to 39.5 miles) and road construction (7.7 miles). Fertilization of 334 acres may decrease the availability of base cations in soils (e.g. calcium and magnesium). Loss of long-term soil productivity from road construction–new corridor and stone pit expansion would occur (up to 8.4 acres).
Hydrology (see Section III, pp.42–50)	Stream water quality would improve in the long-term through road maintenance (16.4 miles) and surface armoring (1.5 miles). Minimal effects to water quantity because less than 25 percent of tree canopy would be removed.	Stream water quality would improve in the long-term road maintenance (39.5 miles) and surface armoring (4.6 miles). Minimal effects to water quantity because less than 25 percent of tree canopy would be removed. Streams would have more structure to dissipate stream energy and trap sediment through the addition of large wood (1.4 miles) and installation of in-stream structures (0.5 miles).	Stream water quality would improve in the long-term through road maintenance (39.5 miles) and surface armoring (4.6 miles). Minimal effects to water quantity because less than 25 percent of tree canopy would be removed. Streams would have more structure to dissipate stream energy and trap sediment through the addition of large wood (1.4 miles) and installation of in-stream structures (0.5 miles).

Resource/Effects Analysis Framework	Alternative 2–No Action	Alternative 1–Proposed Action	Alternative 3–The Branch
Air quality (see Section III, pp.50–55)	No additional direct or indirect effects are anticipated. Cumulative effects, including OGD, are minimal.	Direct and indirect effects due to prescribed burning and timber harvesting are minimal. Cumulative effects, including OGD, are minimal.	Direct and indirect effects due to prescribed burning and timber harvesting are minimal. Cumulative effects, including OGD, are minimal.
Wildlife and Plants (see Section III, pp.55–72 and Appendix C)	**Habitat Fragmentation:** Total core area in the cumulative effects analysis area is 5,869; Mean patch size is 64 acres; Number of patches is 92; Largest patch is 1175 acres. **Habitat composition and structure.** Structural diversity would increase, but less than in the action alternatives. Disturbances to wildlife species and habitat would be short term in nature and could potentially impact individuals on site during	**Habitat Fragmentation:** Total core area reduced by 16.6 percent to 4,893 acres; Mean patch size reduced by 23.4 percent to 49 acres; Number of patches increases to 99; Largest patch is 928 acres. **Habitat composition and structure.** Structural diversity would increase more than in Alternatives 2 and 3; Wildlife habitat improvements would help to achieve progress towards Forest Plan objectives. Disturbances to wildlife species and habitat would be short term in nature and could potentially impact individuals on site during treatments. Early age class would be created on 10.3 percent (1,424 acres) of NFS lands in project area and help achieve the Forest Plan goal of 10 to 12 percent in MA 3.0 across the ANF. Late-structural habitat increases to 52.9 percent (7,328 acres) of the NFS lands in the project area. Aquatic habitat would improve following road and riparian improvements.	**Habitat Fragmentation:** Total core area reduced by 12.4 percent to 5,141 acres; Mean patch size reduced by 12.5 percent to 56 acres; Number of patches increases is 92; Largest patch is 1,119 acres. **Habitat composition and structure.** Structural diversity would increase more than in Alternative 2, but less than in Alternative 1; Wildlife habitat improvements would help to achieve progress towards Forest Plan objectives. Disturbances to wildlife species and habitat would be short term in nature and could potentially impact individuals on site during treatments. Early age class would be created on 8.4 percent (1,162 acres) of NFS lands in project area and help achieve the Forest Plan goal of 12 percent in MA 3.0 across the ANF. Late-structural habitat increases to 54.4 percent (7,535 acres) of the NFS lands in the project area. Aquatic habitat would improve following road and riparian improvements.

Resource/Effects Analysis Framework	Alternative 2–No Action	Alternative 1–Proposed Action	Alternative 3–The Branch
Wildlife and Plants (continued)	**Management Indicator Species:** Mourning warbler habitat (early structural forest) would be created on 0.3 percent (44 acres from FY06 and FY07 Regeneration projects) of NFS lands in the project area. Proposed oak management would not occur. Aquatic habitat would improve from installation of multi-faceted log complex and from surface armoring (road maintenance). For the remaining MIS, there would be no effects to contribute to local or regional change in habitat quality of these species. **Federally listed threatened and endangered species, Regional Forester's Sensitive Species (RFSS), and species with viability concerns (SVC):** No effects are anticipated to jeopardize the continued existence of any of these species or their habitat; Previously approved herbicide application (44 acres) coupled with area fencing would help restore understory diversity and abundance and release treatments (84 acres) would likely maintain or increase species diversity in young stands.	**Management Indicator Species:** Mourning warbler habitat (early structural forest) would be created on 10.3 percent (1,424 acres) of NFS lands in project area. The proposed 498 acres of oak management would provide habitat for the cerulean warbler. Aquatic habitat would improve from adding large wood to streams, from installation of in-stream structures, and multi-faceted log complex, and from surface armoring. For the remaining MIS, there would be no effects to contribute to local or regional change in habitat quality of these species. **Federally listed threatened and endangered species, RFSS, and SVC:** No effects are anticipated to jeopardize the continued existence of any of these species or their habitat; Herbicide application (2,129 acres) coupled with area fencing (1,425 acres) would help restore understory diversity and abundance; Release treatments (2,422 acres) would likely maintain or increase species diversity in young stands.	**Management Indicator Species:** Mourning warbler habitat (early structural forest) would be created on 8.4 percent (1,162 acres) of NFS lands in project area. The proposed 444 acres of oak management would provide habitat for the cerulean warbler. Aquatic habitat would improve from adding large wood to streams, from installation of in-stream structures, and multi-faceted log complex, and from surface armoring. For the remaining MIS, there would be no effects to contribute to local or regional change in habitat quality of these species. **Federally listed threatened and endangered species, RFSS, and SVC:** No effects are anticipated to jeopardize the continued existence of any of these species or their habitat; Herbicide application (1,741 acres) coupled with area fencing (1,140 acres) would help restore understory diversity and abundance; Release treatments (2,084 acres) would likely maintain or increase species diversity in young stands.

Resource/Effects Analysis Framework	Alternative 2–No Action	Alternative 1–Proposed Action	Alternative 3–The Branch
Wildlife and Plants (continued)	**Game habitat and migratory birds:** A variety of structured habitat would be provided and maintained; however, early structural habitat would decline since no additional early structural habitat would be created.	**Game habitat and migratory birds:** A variety of structured habitat would be provided and maintained.	**Game habitat and migratory birds:** A variety of structured habitat would be provided and maintained.
NNIP Species (see Section III, pp.73-76)	Existing NNIP species would continue to spread.	Proposed treatments (188 acres) would lessen the potential for introduction and spread of NNIP species and their impacts native plants and their habitats.	Proposed treatments (188 acres) would lessen the potential for introduction and spread of NNIP species and their impacts native plants and their habitats.
Heritage (see Section III, p.76)	No direct, indirect, or adverse cumulative effects are anticipated	No direct, indirect, or adverse cumulative effects are anticipated.	No direct, indirect, or adverse cumulative effects are anticipated.
Recreation Opportunities and Forest Settings (see Section III, pp. 77–82)	No changes are anticipated to ROS classifications or inventoried SILs from approved Forest Service activities. There would be no effects to recreation activities or use patterns due to timber harvests. Size and shape of unroaded area 53 (610 acres) (USDA-FS 2003) would not change.	No changes are anticipated to ROS classifications or inventoried SILs from proposed and approved Forest Service activities. There would be limited effects to recreation activities and use patterns due to timber harvests and road construction. Stone pit development that would provide opportunities for additional access, dispersed camping, target shooting, and parking. Snowmobile trail use may be disrupted due to additional vehicle use on haul routes that are also designated as trails. Size and shape of unroaded area 53 (610 acres) (USDA-FS 2003) would increase due to proposed road decommissioning by 86 acres to 696 acres.	No changes are anticipated to ROS classifications or inventoried SILs from proposed and approved Forest Service activities. There would be limited effects to recreation activities and use patterns due to timber harvests and road construction. Stone pit development that would provide opportunities for additional access, dispersed camping, target shooting, and parking. Snowmobile trail use may be disrupted due to additional vehicle use on haul routes that are also designated as trails. Size and shape of unroaded area 53 (610 acres) (USDA-FS 2003) would increase due to proposed road decommissioning by 86 acres to 696 acres.

Resource/Effects Analysis Framework	Alternative 2–No Action	Alternative 1–Proposed Action	Alternative 3–The Branch
Recreation Opportunities and Forest Settings (continued)	No adverse cumulative effects are anticipated from approved Forest Service activities. Future OGD could bring about a change in ROS, SIL, and recreation activities and their use patterns.	No adverse cumulative effects are anticipated from proposed and approved Forest Service activities. Future OGD could bring about a change in ROS, SIL, and recreation activities and their use patterns.	No adverse cumulative effects are anticipated from proposed and approved Forest Service activities. Future OGD could bring about a change in ROS, SIL, and recreation activities and their use patterns.
Economics (see Section III, pp.82–84)	Planning costs ($500,000.00) would occur. Routine maintenance activities would occur. Additional wood products would not be provided and additional jobs would not occur. Cumulatively, less returns to Forest County than in Alternatives 1 or 3.	Timber harvesting (31.8 MMBF) would provide an economic benefit through jobs produced and provide receipts returned to local school districts and townships and to the U.S. Treasury ($6,079,524.00). Project costs include planning and implementation ($7,360,428.00). Net cash flow is (-) $1,280,904.00.	Timber harvesting (25.3 MMBF) would provide an economic benefit through jobs produced and provide receipts returned to local school districts and townships and to the U.S. Treasury ($4,836,854.00). Project costs include planning and implementation ($6,416,592.00). Net cash flow is (-) $1,579,738.00.
Human Health and Safety (Section III, pp.84–85)	No adverse cumulative effects are anticipated. All alternatives would avoid adverse impacts to public health and safety through implementation of ANF LRMP standards and guidelines, Pennsylvania BMPs, project design features, timber sale contract requirements, Office of Safety and Health Administration (OSHA) requirements, and standard operating safety procedures (including OGD operations).	No adverse cumulative effects are anticipated. All alternatives would avoid adverse impacts to public health and safety through implementation of ANF LRMP standards and guidelines, Pennsylvania BMPs, project design features, timber sale contract requirements, Office of Safety and Health Administration (OSHA) requirements, and standard operating safety procedures (including OGD operations).	No adverse cumulative effects are anticipated. All alternatives would avoid adverse impacts to public health and safety through implementation of ANF LRMP standards and guidelines, Pennsylvania BMPs, project design features, timber sale contract requirements, Office of Safety and Health Administration (OSHA) requirements, and standard operating safety procedures (including OGD operations).

III. Environmental Consequences

This section summarizes the physical, biological, and social environmental consequences of implementing each alternative. It also presents the scientific and analytical basis for the comparison of alternatives that are being considered in detail.

Introduction

Project Area and Description of the Affected Environment

The project area and boundary are shown on Map 1. The project area consists of approximately 15,090 acres of NFS lands and private land (1,239 acres) and is located in the Salmon Creek (6th level) watershed. The majority of the NFS lands within the project area are located within MA 3.0–Even-aged Management (8,959 acres) while the remainder (4,892 acres) are located in MA 2.2 –Late Structural Linkages and have been actively managed for the past 30 years.

For this project, the discussion and disclosure of effects for Alternative 2–No Action on each resource is equivalent to the existing condition of lands within the project area and is considered the ***affected environment*** since none of the proposed activities would be implemented. Routine maintenance and previously approved activities would be implemented (see Section I Purpose and Need, pp. 4–5 and Section III. Environmental Consequences, pp. 25–37). In addition, the description of the affected environment by resource area is found in the ANF Forest Plan FEIS (USDA-FS 2007b).

The project area contains approximately 116 miles of roads: 40 miles of National Forest System (NFS) roads, 2 miles of State and Township roads, and 62 miles of non-system roads, most of which are OGD access roads. The project area also contains approximately 21.5 miles of the Allegheny Snowmobile Loop and Connectors. There are 12.3 miles of the North Country National Scenic hiking trail within the project area. The project area contains no designated equestrian trails.

Within the project area, forested stands consist primarily of even-aged, second-growth trees as a result of timber harvesting carried out in the late 19th and early 20th centuries. The age, structure, and maturity of the stands within the project area are fairly uniform with 83 percent of them greater than 50 years old. The majority of the project area consists of Allegheny and upland hardwood forest types. Approximately 4 percent of the project area (549 acres) is early-structural habitat, of which approximately 146 acres have been created since 2003.

Table 3–Existing condition (2012) within the project area

Stocking (%)		Age Class (%)		Forest Type (%)	
Non-forest	3	Non-forest	3	Non-forest	3
Non-stocked (0-9)	<1	0 to 20 years (early-structural habitat)	4	Northern hardwoods	2
Poorly stocked (10-34)	4	21 to 50 years (mid-structural habitat)	10	Allegheny hardwood	20
Moderately-stocked (35-59)	13	51 to 90 years (mid-structural habitat)	20	Upland hardwoods	50
Fully-stocked (60-100)	77	91 to 110 years (mid-structural habitat)	59	Conifer	<1%
Overstocked (greater than100)	3	111 years and greater (late-structural habitat)	4	Oak	13

Except for two parcels, Tract 13 (101.43-acres) and Tract 923 (229.29 acres), the subsurface mineral estates under the project area are privately owned. Tract 13 was recently leased by the federal government to a private mineral developer that has drilled six shallow wells in Tract 13. There are no plans for additional shallow well development on Tract 13 by the private mineral developer. Approximately 500 (active or dormant) private oil and gas wells occur within the project area. This is about 1 well for every 30 acres within the project area. Oil and gas wells have associated tank batteries, pipelines, additional equipment, power lines, and access roads.

Four future shallow well development scenarios (ranging from 302 to 1,336 new wells) were considered for OGD within the project area (in project file) over the next two decades. The scenario using the projections from the recent OGD (past 3 years) was selected because it appears to be the most reasonably foreseeable future estimate of shallow OGD within the project area based on past OGD within the project area and current OGD on the ANF. Using this scenario, an additional 633 shallow wells could be developed within the project area resulting in up to 823 acres (5.5 percent of the project area) of additional disturbance over the next 20 years. Deep well shale development was also projected using projections from the Programmatic Effects of Private Oil and Gas Activity on the Allegheny National Forest (USDA-FS 2010a, unpublished) and several potential well pad spacing's. Deep well development is still uncertain as to intensity and coverage. The scenario using the projection from the Programmatic Effects of Private Oil and Gas Activity on the Allegheny National Forest (USDA-FS 2010a, unpublished) was selected to be the most reasonable foreseeable future estimate of deep OGD because of the uncertainty as to intensity and coverage. Using this scenario, four deep well pads (with several wells per pad) could be developed within the project area resulting in approximately 40 acres of disturbance over the next 20 years. The potential cumulative effects of private OGD are analyzed by the affected resources. This is not an OGD proposal.

Analysis Framework

This analysis is tiered to the ANF Forest Plan FEIS (USDA-FS 2007b). Chapter 3 of the Forest Plan FEIS (USDA-FS 2007b) provides an analysis of the following resources on the ANF and is incorporated by reference into this EA: economics, pp. 3-399–3-443; heritage, pp. 3-380–3-384; human health and safety, pp. 3-419–3-443; hydrology, pp. 3-22–3-51; recreation, pp. 3-296–3-328; scenery, pp. 3-370–3-380; soils, pp. 3-7–3-21; transportation, pp. 3-64–3-74; vegetation, pp. 3-77–3-179; and wildlife and non-native invasive species, pp. 3-179–3-295. In addition, the approved FEISs and EAs listed in Section I provide information to support this analysis. Current supporting ANF air quality information is provided in the Programmatic Effects of Private Oil and Gas Activity on the Allegheny National Forest (USDA-FS 2010a, unpublished). Current supporting ANF OGD information is provided in the Programmatic Effects of Private Oil and Gas Activity on the Allegheny National Forest (USDA-FS 2010a, unpublished) and Site-Specific Oil and Gas Development on the Allegheny National Forest (USDA-FS 2010b, unpublished).

The Programmatic Effects of Private Oil and Gas Activity on the Allegheny National Forest document describes the programmatic effects of private oil and gas activity on the physical, biological, and social resources. It incorporates information contained in the Forest Plan FEIS and provides additional information, such as updated air quality information. It includes proposed mitigation measures for private OGD that are designed to maintain surface resource values.

The Site-Specific Oil and Gas Development on the Allegheny National Forest document serves as a reference that discloses site-specific impacts to surface resources resulting from proposed OGD (in the former Transition EIS process) and site-specific, scientifically based mitigation measures developed to minimize these impacts.

The Biological Assessment (BA) for the Endangered Species Act (ESA)–Threatened and Endangered Federally Listed Species is provided in Appendix C of this EA. The Biological Evaluation (BE) for Regional Forester's Sensitive Species (RFSS) and wildlife report, which includes species with viability concerns (SVC) and management indicator species (MIS), are summarized in Section III. Environmental Consequences, on pages 62–72 and are located in the project file.

Indicator Measures for Resource Analysis

To analyze and disclose the environmental, social, and economic effects of the Alternatives considered in detail for this project, the following indicator measures (IMs) by resource area were identified by the ID team and responsible official.

Table 4–Indicator measures by resource area for analyzing effects

Resource Analyzed	Indicator Measure
Soils	IM-1: Effects of proposed activities on long-term soil productivity.
Hydrology	IM-2: Effects of proposed activities on water quality and quantity.
Air	IM-3: Effects of proposed activities on the attainment of NAAQS.
Wildlife and Plants	IM-4: Effects of proposed activities on habitat fragmentation. See Appendices C for the effects analysis for threatened and endangered species.
NNIP Species	IM-5: Effects of proposed activities on causing or promoting the introduction or spread of NNIP species.
Heritage	IM-6: Effects of the proposed activities on cultural resources.
Recreation Opportunities and Forest Settings	IM-7: Changes of the ROS classifications from proposed activities. IM-8: Effects of proposed activities on Landscape Character and effects of proposed activities that cause Scenic Integrity Levels not to be met. IM-9: Effects of proposed activities on recreation activities and use patterns.
Human Health and Safety	IM-10: Risks to human health and safety from proposed activities.
Economics	IM-11: Effects of proposed activities on providing goods and services.

Cumulative Effects Analysis Areas

Cumulative effects consider the effects of past, present, and proposed activities on a landscape scale across space and time. CEQ regulations define cumulative effects as "… the impact on the environment which results from 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 (40 CFR 1508.7). The cumulative effects analysis examines the effects of other activities on NFS and private lands that may occur across the landscape.

Comprehensive lists of such activities (located in the project file) have been compiled for past, present, and reasonably foreseeable future activities that may potentially contribute to cumulative effects. These lists were used as a reference for all cumulative effects analyses conducted within each resource section. In addition, the following definitions clarify the differences between past, present, and reasonably foreseeable future activities.

1. ***Past activities:*** In order to understand the contribution of past activities to cumulative effects, this analysis relies on current environmental conditions as a proxy for the impacts of past activities for most resources. This is based on the existing conditions (pp.25–37) and reflects the aggregate of prior human actions and natural events that have affected the environment of the cumulative effects analysis areas (outlined in Tables 7 and 9) and contribute to cumulative effects.

2. ***Present activities:*** Activities currently undergoing implementation on NFS lands of the ANF, as well as activities on private lands, within the cumulative effects analysis areas outlined in Tables 7 and 9.

3. ***Reasonably foreseeable future activities:*** Known activities on NFS lands of the ANF, as well as on private lands, within the cumulative effect analysis areas outlined on Tables 7 and 9 that would be implemented within the next 20 years.

The following tables provide detailed and summary information on present and reasonably foreseeable future activities that will be used for the analysis.

Table 5–Present condition (2012) of vegetation on private lands within the project area (source–aerial photography [GIS–PA MAP])

Activity/Condition	Acres
0penings	9
0-20 Years Old	195
Greater than 20 Years Old	1,035
Total	1,239

It is very difficult to distinguish the "affected acres" or overall effects of these harvests from aerial photos. Using timber harvest projections for private non-industrial lands from the Forest Plan FEIS (USDA-FS 2007b, Table 3-42, p. 3-177), it is estimated that 5 acres of final harvests, 6 acres of intermediate timber harvests and 2 acres of selection harvests would occur on the private lands within the project area over the next two decades. Timber harvest projections for private industrial lands from the Forest Plan FEIS (USDA-FS 2007b, Table 3-42, p. 3-177) estimate that 159 acres of final harvests and 219 acres of intermediate timber harvests would occur on the private lands within the project area over the next two decades.

Table 6–Project area summary of silvicultural treatments on NFS lands (2002–2012)

Treatment	Acres
Shelterwood removal cut	189
Salvage cut	133
Fencing or Tree Shelter Installation	104
Herbicide	62
Fertilizer	40
Site preparation	53
Release	292

Note: These treatments are similar to the proposed silvicultural treatments in the proposed action (Alternative 1).

Table 7–Anticipated project area silvicultural treatments (includes previously approved and proposed treatments) on NFS lands (2013–2032)

Treatment	Projected Implementation	Alternative 1	Alternative 2	Alternative 3
Even-aged Partial Harvest		**Acres**	**Acres**	**Acres**
Intermediate thinning	2013 to 2032	681	0	524
Total Partial Harvest		***681***	***0***	***524***
Even-aged Final Harvest				
Shelterwood seed cut/removal	2013 to 2032	956	19	783
Overstory Removal		183	25	148
Prep Cut/Shelterwood Seed/Shelterwood Removal		286	0	232
Prep Cut/Shelterwood Seed/Two-Aged Removal		12	0	12
Total Final Harvest		***1,437***	***44***	***1,175***
Uneven-aged Management				
Single Tree Selection/ Group Selection	2013 to 2032	275	0	*200*
Group Selection		3	0	*3*
Intermediate thinning		196	0	196
Total Uneven-aged Harvest		***474***	***0***	***399***
Total Harvest		***2,592***	***44***	***2,098***
Reforestation Treatments				
Herbicide application	2013 to 2032	1,942	44	1,604
Fertilization		419	15	334
Fencing or tree shelter installation		1,425	44	1140
Site preparation		1,747	44	1409
Tree planting for species diversity		192	44	169
Release for species diversity		2,422	84	2,084
Prescribed Burning and/or Scarification		525	0	453
Grapevine Control		329	0	287

Table 8–Age Class Distribution on National Forest System lands (2012 and 2032) for Alternatives 1, 2, and 3

Age Class	NFS Acres (2012)	Percent (2012)	Alternative 1 NFS Acres (2032)	Alternative 1 Percent (2032)	Alternative 2 NFS Acres (2032)	Alternative 2 Percent (2032)	Alternative 3 NFS Acres (2032)	Alternative 3 Percent (2032)
Openings	417	3.0	414	3.0	417	3.0	414	3.0
0-10	146	1.1	472	3.4	0	0	418	3.0
11-20	403	2.9	965	7.0	41	0.3	748	5.4
21-30	1,221	8.8	232	1.7	232	1.7	232	1.7
31-40	68	0.5	344	2.5	344	2.5	344	2.5
41-50	43	0.3	1,202	8.7	1,202	8.7	1,202	8.7
51-60	7	0.1	48	0.3	48	0.3	48	0.3
61-70	65	0.5	43	0.3	43	0.3	43	0.3
71-80	394	2.8	7	0.1	7	0.1	7	0.1
81-90	2,343	16.9	46	0.3	80	0.6	46	0.3
91-100	5,013	36.2	488	3.5	517	3.7	488	3.5
101-110	3,218	23.2	2,261	16.3	2,530	18.3	2,325	16.8
111+	513	3.7	7,328	52.9	8,391	60.6	7,535	54.4
Total	**13,851**	**100**	**13,851**	**100**	**13,851**	**100**	**13,851**	**100**

Table 9–Summary of past, present, and reasonably foreseeable future activities in the project area, including project outcomes for all alternatives

Activity	Present (2012)	Future (2032)[a]					
		Alt 1	*Alt 1 CE (2032)*	*Alt 2*	*Alt 2 CE (2032)*	*Alt 3*	*Alt 3 CE (2032)*
	Acres/Percent						
Even aged final harvests (temporary openings)							
NFS lands	549	1,380	1,570	0	190	1,118	1,308
Private lands	195	0	164	0	164	0	164
Total final harvests	744	1,380	1,734	0	354	1,118	1,472
Percent of project area	4.9	9.1	11.5	0	2.3	7.4	9.8
Non-forest openings (non-OGD)(includes natural openings, wildlife food-plots, wetlands, savannahs and man-made openings such as stone pits and utility corridors)							
NFS lands	417	421	421[b]	417	417	419	419[b]
Private lands	9	0	9	0	9	0	9
Total acres	426	421	430	417	426	419	428
Percent of project area	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Oil and gas development (OGD)(includes NFS and private lands)							
Wells (number)	500	637	1,137[c]	637	1,137[c]	637	1,137[c]
OGD related disturbance	500	863	1,363[d]	863	1,363[d]	863	1,363[d]
Percent of project area	3.3	5.7	9.0	5.7	9.0	5.7	9.0
Total non-forest (OGD and non-OGD)							
Percent of project area	6.1	8.5	11.8	8.5	11.8	8.5	11.8

[a] *Includes previously approved silvicultural treatments with implementation pending*

[b] *Total includes existing openings, proposed stone pit expansion (Alternatives 1 and 3), and proposed Forest Service road construction – new corridor (Alternative 1).*

[c] *Total includes existing shallow wells (500), estimated shallow wells to be developed within the foreseeable future (633), and estimated deep wells within the foreseeable future (4).*

[d] *Total includes area disturbed from existing shallow wells (500 acres), area disturbed from estimated shallow wells to be developed within the foreseeable future (823 acres), and area disturbed from estimated deep wells within the foreseeable future (40 acres).*

Cumulative effects analysis areas vary by resource and extend over space and time (see Table 10). It is an area analyzed out to where potential effects of the alternatives become negligible. For each resource, the boundary and rationale for selecting the boundary is provided. Potential cumulative effects of the alternatives are analyzed by resource.

Table 10–Spatial and temporal cumulative effects boundaries by resource area

Resource	Spatial Boundary and Rationale	Temporal Scale and Rationale
Soils	The project area (15,090 acres), including private lands, is the boundary for the cumulative effects analysis. This boundary encloses all the proposed treatment areas in the project.	The timeframe for this analysis goes 10 years into the past and 20 years into the future to analyze potential cumulative effects. Detrimental effects from soil compaction from a single event are not expected to persist beyond five years. Likewise, where ground cover is removed, reestablishment of vegetation can be expected to occur in less than five years. This timeframe allows for completion of proposed, remaining approved, and foreseeable future activities.
Hydrology	The hydrology cumulative effects analysis area (36,365 acres) includes the Salmon Creek watershed (35,043 acres), plus 3 other subwatersheds (see Table 11 and Map 10). The cumulative boundary includes 26,094 acres of NFS lands and 10,271 acres of private lands. Impacts are not expected to be identifiable beyond these boundaries. Cumulative effects of the proposed activities would be masked, or diluted, to the point that ties with potential site disturbance would not be apparent or measurable.	The timeframe for this analysis goes 10 years into the past and 20 years into the future to analyze potential cumulative effects. This timeframe includes any previous effects of activities and natural events with current, proposed, and reasonably foreseeable future activities.
Air	The project area is the boundary for the cumulative effects analysis. Since air effects occur as project activities occur and then are quickly diffused into the atmosphere, this analysis will estimate when the highest annual levels of emissions occur and compare these emission levels to the four-county projected levels calculated by VISTA for the four-county area. So estimating when the highest levels will occur and then given the projected context in the four-county area will show the level of significance they are contributing.	The timeframe for this analysis goes 8 years into the future to analyze potential cumulative effects. This analysis relies on current environmental conditions as a proxy for the impacts of past actions. This analysis will qualitatively project when the activities in the project area will have the greatest impact (emissions) and compare it to the NAAQS, which is an annual set of air standards for human health. Emission projections for the four-county area are not available beyond 2018 at this time.

Resource	Spatial Boundary and Rationale	Temporal Scale and Rationale
Wildlife and Plants	The project area is the cumulative effects analysis boundary for threatened and endangered species in the biological assessment and many of the Regional Forester's Sensitive Species (RFSS). Many of these species and their habitat home ranges are conducive to a forest condition that exists in the project area. Since there is no suitable habitat for the threatened or endangered mollusks within the entire Salmon Creek watershed, expanding the cumulative effects analysis area beyond the project boundary would simply result in similar effects. Within this cumulative effects project boundary, vegetation cover types, forest structure, wildlife habitats, climate, soil types, and developments from federal and private activities are similar. This landscape shares the same drainage pattern and terrain, aspect and exposure, and natural disturbances such as insect pests, diseases, and wind and ice storms. The cumulative effects of the project alternatives when added to other past, present and reasonably foreseeable future Forest Service and private actions become diluted beyond this boundary for many species. This cumulative effects analysis boundary includes a total of 15,090 acres which includes 13,851 acres of National Forest land (92 percent) and 1,239 acres of private property (8 percent). For streams, management indicator species (MIS) aquatic invertebrates and many RFSS mobile aquatic species, the cumulative effects analysis area is the entire Salmon Creek watershed (36,365 acres). Depending on the scale of the proposed federal action, resources impacted, the mobility, sensitivity, or adaptibility of the species to the action under consideration, cumulative effects on a particular species may be evaluated on a broader-scale or	Encompasses the time period when the past changes in forest habitat would have occurred and the majority of the proposed federal actions including reforestation activities such as site prep, release cuts, fencing will be completed. Plus a disclosure of activities through the next planning period. Beyond the 20 years, changes would not be measurable because other unknown environmental variables would likely exist and cannot be measured.

Resource	Spatial Boundary and Rationale	Temporal Scale and Rationale
Wildlife and Plants (continued)	across a more restricted area. The cumulative effects analysis area may vary depending on the species under consideration, its home range, and potential effects of activities. Because aquatic and riparian systems are linear, connected, and form larger systems, any adverse impacts to the perennial or upper reaches (intermittent sections) of any of the streams within the project area could have an impact on suitable habitat downstream of the project area; therefore, the cumulative effects analysis area was enlarged to measure these impacts. It also includes a portion of Salmon Creek watershed that goes outside the ANF proclaimation boundary near the town of Marienville, PA. In addition, it covers additional acres to the watershed by encompassing FR212 as some of the management activities proposed in the project area are accessed from this road segment. Approximately 10,362 acres of private land and other non-federal land occur within this cumulative effects analysis area on portions of 16 parcels. With the exception of three blocks totalling 372 acres (1 percent), the sub-surface oil and gas rights are privately owned across the entire cumulative effects analysis area. This cumulative effects analysis area contains 26,003 acres of NFS lands managed as MA 3.0 (19,686 acres), MA 2.2 (5,088 acres), and MA 6.1 (1,229 acres). In addition to these aquatic species, the land-base used for the patch analysis of fragmentation regarding the cumulative effects of past, present and future actions is the same area used for stream and aquatic biological resources affected by the proposed Salmon West project. Totaling 36,365 acres, the cumulative effects area was chosen because it encompasses both public and large	

Resource	Spatial Boundary and Rationale	Temporal Scale and Rationale
Wildlife and Plants (continued)	blocks of private lands across the entire Salmon Creek watershed. The patch analysis is a landscape model that emphasizes larger blocks displaying see connectivity and corridors and their placement within and adjacent to the project area.	
NNIP species and Vegetation	The project area is the boundary for the cumulative effects analysis. The surrounding landscape is similar in forest composition, age-class, and amount of permanent openings and acres of NFS and non-NFS lands and has experienced similar levels and types of activities as those within the project area.	Twenty (20) years into the future is the time frame to analyze potential cumulative effects. This analysis relies on current environmental conditions as a proxy for the impacts of past actions. This timeframe allows for completion of proposed and remaining approved activities and foreseeable future activities.
Heritage	The project area is the boundary for the cumulative effects analysis. This boundary was selected because it encloses all of the proposed treatment areas for the project. Cultural resources outside the project area would not be affected by the proposed activities.	Twenty (20) years into the future is the time frame to analyze potential cumulative effects. This analysis relies on current environmental conditions as a proxy for the impacts of past actions. This timeframe allows for completion of proposed, remaining approved, and foreseeable future activities.
Recreation Opportunities and Forest Settings	For recreation, the project area is the boundary for the cumulative effects analysis. The effects to recreation are localized and stay within the project area. Likewise, the effects to recreation activities outside the project area are similar to those within it, and their effects do not extend into the project area. The cumulative effects analysis area for scenery includes the Salmon Creek and The Branch watersheds (see Map 10). Criteria used to establish this scenery cumulative effects analysis area includes the degree of interest in scenery within the project area and the ability to capture the impacts to scenery viewshed. Scenic corridors in the project area include two snowmobile trail connectors and a portion of the main Allegheny Snowmobile Loop (ASL) and the North Country National Scenic Trail (NST), which bisects the project area. The ASL and its connectors are Concern Level 2 corridors that	For recreation, 10 years prior to this project and 20 years into the future is the time frame to analyze potential cumulative effects. This time period provides an overall view of the incremental impact of vegetation management and OGD activities in combination with past, current, and future project proposals. It considers the effects from past activities and the completion of proposed, previously approved, and reasonable foreseeable future activities. For scenery, 10 years prior and 20 years into the future is the time frame to analyze potential cumulative effects. This time period allows for consideration of the effects from past, previously approved and not yet completed, proposed, and reasonably foreseeable future activities. It allows for incremental impacts to scenery from vegetation management and OGD activities as related to past, current, and future proposals.

Resource	Spatial Boundary and Rationale	Temporal Scale and Rationale
Recreation Opportunities and Forest Settings	represent a secondary interest in scenery in the project area. The North Country NST is a Concern Level 1 corridor that represents a primary interest in the scenery in the project area. The views from these travel corridors are contained within this cumulative effects analysis area.	
Economics	It includes Warren, Forest, McKean, and Elk counties. The project occurs in Elk County, and it is likely that much of the products produced and the jobs filled would be within the counties associated with the ANF.	Twenty (20) years into the future is the time frame to analyze potential cumulative effects. This analysis relies on current environmental conditions as a proxy for the impacts of past actions. This time period encompasses the time frame in which a majority of the commercial treatments would occur, federal funds would be expended, and related monies would be distributed to the county.
Human Health and Safety	The project area is the boundary for the cumulative effects analysis. Potential effects (from herbicide application and prescribed burning) are localized and stay within the project area (all in the same watershed). Likewise, effects outside the project area (different watersheds or downstream) are similar to those within it, and their effects would not extend into the project area.	Twenty (20) years into the future is the time frame to analyze potential cumulative effects. This analysis relies on current environmental conditions as a proxy for the impacts of past actions. This timeframe allows for completion of proposed, remaining approved, and reasonably foreseeable future activities.

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Soils

Analysis Framework

Soils on the ANF are described in the Forest Plan FEIS in terms of effects on 1) soil nutrients, 2) soil erosion, and 3) soil compaction and puddling/rutting (USDA-FS 2007b, pp. 3-7–3-21). This analysis compares the potential effects of the proposed activities for each alternative, including the amount and category of soil disturbance and the likelihood of long-term soil impairment. This comparison considers site-specific effects of the proposed activities as well as general effects analyzed in the Forest Plan FEIS (USDA-FS 2007b, pp. 3-7–3-21). Descriptions and maps of soil types in the project area are provided in the project record.

The Forest Service manual describes seven categories of soil disturbance that may result from forest management activities: 1) compaction, 2) displacement, 3) puddling/rutting, 4) burned (which is directly related to the intensity of the fire), 5) eroded, 6) lack of ground cover, and 7) mass movement (USDA-FS 2012a, p.3). These potential soil disturbances could result in detrimental soil conditions such as a long-term loss of soil organic matter, impaired nutrient cycling, and alteration of soil air and moisture relationships, as well as hydrologic functions. Loss of soil material, through erosion or mass movement, may result in off-site environmental impacts.

One of the goals of the Forest Plan is to manage soil disturbances from management activities such that they do not result in long-term loss of inherent soil quality and function (USDA-FS 2007a, p.14). This analysis assumes that Forest Service activities would be implemented following Forest Plan standards and guidelines, Pennsylvania best management practices (BMPs), and project design features, as well as all other applicable laws, regulations, and policies, to minimize soil disturbance and maintain long-term soil productivity. Effects to soils are mitigated primarily by minimizing the amount of disturbance (collectively less than 15 percent of the activity areas), through timing of treatments (seasonal restrictions), by reestablishing vegetation on disturbed areas, and through natural processes.

Soils designated as “prime farmland” and “farmland of statewide importance” are federally designated by the USDA-Natural Resource Conservation Service and protected by law. There are activities proposed on farmland soil map units in both action alternatives; however, except for the proposed road construction (new corridor) and stone pit expansion, none of the proposed activities would result in the permanent conversion of land. Also, none of the proposed road construction–new corridor or stone pit expansion is located on soils designated as farmland.

Environmental Consequences

IM-1: Effects of proposed activities on long-term soil productivity.

Direct and Indirect Effects

Under Alternative 2 (no action), none of the proposed Forest Service activities would occur; therefore, there would be no soil disturbance from the activities proposed in the action alternatives. Natural weathering and soil erosion would occur at background levels. Soils in the project area would continue to acidify due to acid deposition. Road maintenance would occur on open Forest Service system roads (approximately 16.4 miles) as funding and management priorities permit. Short-term effects of road maintenance activities would include potential increases in soil movement during road maintenance activities but would have long-term effects of stabilizing roadside soils and reducing erosion potential. Remaining approved Forest Service activities would include short-term and long-term effects as described in the action alternatives (Alternative 1–Proposed Action and Alternative 3–The Branch).

The action alternatives would have similar effects to soil resources, with less soil disturbance occurring under Alternative 3 due to less proposed timber harvesting, associated reforestation activities, and road construction (including new and existing corridors).

- Timber harvesting activities would result in localized, small-scale, and short-term soil compaction, puddling, and rutting due use of heavy equipment in forested stands and from skidding and landing logs and in localized erosion due to increased traffic on unpaved roads. Alternative 1 proposes approximately 2,548 acres of commercial timber harvests and Alternative 3 proposes approximately 2,054 acres of commercial timber harvests. With implementation of Forest Plan standards and guidelines, Pennsylvania BMPs, and project design features, these soil disturbances would be limited to less than 15 percent of the activity areas (up to 382 acres [2.8 percent of NFS lands within the project area] in Alternative 1 and up to 308 acres [2.2 percent of NFS lands within the project area] in Alternative 3). Both action alternatives proposed commercial timber harvests in areas with wet soils. Seasonally restricting timber harvest activities to dry or frozen conditions, use of low ground pressure equipment, and avoiding perennially wet areas and steep slopes would minimize or avoid soil disturbance in these areas. The effects of low-intensity vegetation management practices, such as release for species diversity, non-commercial thinning, and understory treatments, to soil resources would be minimal. These activities are short in duration, result in little to no soil disturbance, and do not usually create detrimental soil conditions.

- Proposed road construction (8.3 miles [35.2 acres] in Alternative 1 and 7.7 miles [32.7 acres] in Alternative 3) and stone pit expansion (up to 6.5 acres) would result in long-term losses in soil productivity where soils are removed or buried. Impacts would be less in Alternative 3 due to less road construction. The proposed addition of non-system roads (road construction–existing corridor) to the Forest Service System under both action alternatives would reduce the potential for erosion by constructing and maintaining these road segments to a higher standard. System roads are considered dedicated land uses and are not considered part of the disturbed soil condition (15 percent). Road maintenance would occur on up to 39.5 miles of Forest Service system roads in Alternatives 1 and 3. Short-term effects of road maintenance activities would include potential increases in soil movement during road maintenance activities but would have long-term effects of stabilizing roadside soils and reducing the potential for erosion. Decommissioning 3.9 miles of road in both action alternatives and armoring of road surfaces with limestone or other durable material would also reduce the potential for erosion.

- Proposed prescribed fire would result in short-term reduction of ground cover and leaf litter and may increase soil pH. However, the prescribed understory burns proposed in the action alternatives would be of low-intensity and any impacts would be short-term and only last until revegetation occurs (USDA-FS 2007b, p. 3-14). Low intensity fires can facilitate nutrient cycling and increase availability of some plant nutrients. Ground scarification may be used along with or in place of prescribed burning and is used to promote oak regeneration. Scarification would involve a small dozer with a root rake and would take place after acorns have dropped during leaf fall. Sensitive areas, like drainages and steep slopes, would be avoided. The proposed scarification methods would not cause detrimental soil conditions (USDA-FS 2007b, p. 3-14). Alternative 3 has prescribed burning/scarification proposed on fewer acres (72 fewer acres) than in Alternative 1; therefore, the effects of proposed prescribed fire/scarification would be less than in Alternative 1.

- The Forest Plan FEIS determined that with the application rates used on the ANF, the herbicides, glyphosate and sulfometuron methyl, would not adversely affect soil nutrient cycling, soil microorganisms, or soil productivity (USDA-2007b, pp. 3-12 and 3-14 and Appendix G, pp. G1-42–G1-44 and G1-104–G1-106). A review of the literature suggests that use of glyphosate in forests, especially at typical application rates used to control striped maple, American beech, and hayscented and New York ferns, does not have lasting impacts on the fungal components in the soil (in project file).

- The proposed fertilization to encourage forest regeneration may alter soil nutrients through base cation loss. However, young trees rapidly uptake most nutrients and proper application should minimize substantial nutrient loss or other potential effects to soil chemistry (USDA-FS 2007b, p. 3-12). Also, the stands proposed for fertilization are dominated by black cherry and located on plateau and shoulder topographic positions, which are typically already low in base cations.

- The proposed NNIP species treatments (up to 188 acres) could result in soil disturbance where heavy equipment is used. Most treatment areas involve individual plants or small populations (less than one acre in size). If mechanical treatment of NNIP species displaces topsoil, the topsoil would be restored.

None of the other activities proposed in the action alternatives would result in any effects to soil resources beyond small-scale, localized, short-term impacts; and therefore, there would be minimal impacts to soil productivity.

Cumulative Effects

In all alternatives, natural weathering, soil erosion, soil formation, and soil acidification due to atmospheric acid deposition would continue to occur at background levels. None of these processes are likely to result in large-scale soil disturbances in the project area.

Within the cumulative effects analysis area, the impacts of the alternatives described above would occur in addition to previously approved Forest Service activities, routine maintenance activities, activities on private lands, and private OGD. These activities would occur regardless of the alternative selected.

Forty-four (44) acres of timber harvests have been approved previously within the cumulative effects analysis area. In the Porkey Heights EA, 1.25 acres of stone pit (FR180A and FR726) expansion was approved within the Salmon West project area. This would result in the conversion of 1.25 acres from forest land to non-forest land over time. These activities would result in an additional (up to) 7.9 acres of soil disturbance, which would be mitigated through Forest Plan standards and guidelines, Pennsylvania BMPs, and project design features.

Activities on private land are often difficult to predict. GIS data shows 500 existing oil and gas wells within the cumulative effects analysis area. The rate and location of potential OGD (well sites and access roads) are unknown at this time and difficult to predict. An analysis of potential OGD within the cumulative effects analysis area estimated the development of 633 shallow wells and 4 deep wells over the next 20 years. This would result in 1,343 acres of forest land (8.8 percent of the cumulative effects analysis area) being converted to non-forest land for well pads, access roads, tank batteries, and other OGD infrastructure. These areas would experience soil disturbance associated with construction and operation of well sites, access roads, and other facilities.

In all alternatives, activities within the cumulative effects analysis area on private and NFS lands have included and are anticipated to include road construction, reconstruction, and maintenance, timber harvesting, skid trail development, and OGD (shallow and deep). These activities have the potential to result in detrimental soil conditions, reduce soil productivity, and cause soil erosion and sedimentation. Based on Forest Plan FEIS estimates of future timber harvesting on non-industrial and industrial forest lands (391 acres) (USDA-FS 2007b, Table 3-42, p. 3-177), an additional 59 acres of soil disturbance may occur on private lands within the cumulative effects analysis area from timber harvesting and associated reforestation activities over the next 20 years. Under Alternative 1, approximately 3 percent (447.5 acres) of the cumulative effects analysis area may be affected by timber harvesting and associated reforestation treatments; approximately 2.5 percent (373.4 acres) in Alternative 3; and approximately 0.4 percent (65.3 acres) in Alternative 2. In the past, the majority of these activities have had conservation measures applied to them (Forest Plan standard and guidelines, Pennsylvania BMPs, and other mitigation measures) applied to them to minimize the effects to soil productivity within NFS and private lands, and it is anticipated that conservation measures would be applied in the future to minimize the effects to soil resources.

By 2032, an additional 1,354 acres of forest land (8.9 percent of the cumulative effects analysis area) would be converted to non-forest land in Alternative 1, an additional 1353 acres (8.9 percent) in Alternative 3, and 1344 acres (8.9 percent) in Alternative 2, which would potentially result in a long-term reduction in soil productivity on these acres. Under all alternatives, it is anticipated that of the potential soil disturbance occurring over the next 20 years would result in long-term effects to approximately 8.9 percent of soil resources (primarily from private OGD) within the cumulative effects analysis area.

Hydrology

Analysis Framework

Protected Water Uses and Criteria Necessary to Protect Each Use

Protected water uses were designated by the PA Department of Environmental Protection (DEP) for all Commonwealth waters. Little Salmon Creek, Salmon Creek, Guiton Run, Two-mile Run, The Branch, and all unnamed tributaries to Salmon Creek are classified as High Quality - Cold Water Fisheries and Fourmile Run is classified as an Exceptional Value - Cold Water Fisheries. These streams should be managed in a way that maintains and/or propagates fish species as well as flora and fauna, which are indigenous to a cold-water habitat and the water quality shall be maintained and protected. The remaining streams that are tributary to the Tionesta Creek are classified as Cold Water Fisheries and should also be managed in a way that maintains and/or propagates fish species as well as flora and fauna, which are indigenous to a cold-water habitat.

There are no streams listed as impaired from meeting Commonwealth water quality standards within the project area (PA-DEP 2010). In the cumulative effects analysis area, a tributary to The Branch is listed as impaired for aquatic resources due to “Municipal Point Source - Cause Unknown”, which is from the Abraxis Juvenile Detention Center. The Abraxis Center has a water pollution control facility that discharges into this stream. Tionesta Creek is also listed for fish consumption due to mercury from “unknown sources.”

Water chemistry in the area is marginal due to soils and bedrock with low buffering capacity, in combination with acid deposition, which specifically affects mineral content and causes the water to be more acidic by lowering the water’s acid neutralizing capacity (USFS 2007b, p. 3-27).

During snow melt or large rain events, episodic acidification can exacerbate pH, acid neutralizing capacity, and alkalinity and release high levels of aluminum by causing a pulse of acids and/or dilution of base cations (e.g., calcium and magnesium). Research on streams in central and southwestern Pennsylvania have shown severe and chronic episodic acidification causing fish mortality and affecting fish distribution (Baker and others 1996). Many streams in the project area have low pH values (less than 5.0) and low alkalinity (less than 5 mg/L), even during summer baseflow when pH and alkalinity usually improve.

Stream habitat monitoring found that Little Salmon Creek lacks habitat diversity that would contribute to improved habitat for aquatic animals and enhanced recreational experiences for anglers. Pools and slow water habitat make up 7 percent of the stream habitat, which is well below the recommended minimum of 35 percent pool. Also, large wood monitoring on Little Salmon Creek shows 44 pieces per mile, which is below the recommended minimum of 75 pieces per mile.

Forest Plan standards and guidelines (USDA-FS 2007a) would be applied to all Forest Service activities; therefore, there should be no adverse cumulative effects on water quality or quantity as a result of proposed treatments. For instance, commercial timber harvests will not occur within riparian or wetland management zones. Actions within riparian and wetland management zones are limited to minimize changes to water quality and water quality (Stuart and Edwards 2006). The Forest Plan FEIS (USDA-FS 2007b) provides documentation, which demonstrated minimal effects to water temperature, nutrient concentrations, and sediment concentrations from proposed activities when Forest Plan standards and guidelines are applied.

Measureable changes to stream flow are predicted to occur when more than 25 percent of a watershed changes from forested to regenerating forest in a 3 to 10 year period (Hornbeck and Kochenderfer 2000, Lynch and Corbett 1990). When changes to streamflow occur, water yield would be expected to occur as in increase in summer low flow, as opposed to peak flows, and occur primarily during the growing season (Megahan and Hornbeck 2000). Even-aged harvests typically result in vigorous increase in herbaceous vegetation, shrubs, and tree seedlings on the ANF. Once this flush of understory vegetation is established, changes to stream flow would be diminished to pre-harvest conditions. Basal area reduction was analyzed for even-aged silvicultural treatments including shelterwood seed cuts, shelterwood removal harvests, and delayed shelterwood removal harvests. For this analysis, it was assumed that these treatments would result in total removal of the stand basal area; however, up to 10 percent of the stand basal area remains after final harvest to meet reserve tree and area requirements. Intermediate treatments were also considered for basal area reductions and these treatments were estimated to remove 30 percent of the basal area of the stand. The average time until hydrologic recovery after an even-aged harvest is between 3 and 10 years (Hornbeck and Kochenderfer 2000), and streamflow regime recovery in central Pennsylvania takes approximately four years (Lynch and Corbett 1990). Based on the Pennsylvania study, this analysis assumes hydrologic recovery would occur after 5 years.

Road construction within 300 feet of streams has the highest potential of any of the proposed activities to affect water quality and quantity, while road reconstruction and hauling on roads within 300 feet of streams have the next highest potential (USDA-Fs 2007b). Sedimentation from roads is the principle concern for water quality and runoff from roads is the principle concern for water quantity. Existing road corridors within 300 feet of a stream that are added to the Forest Service road system could reduce sedimentation and runoff where the roads are improved to Forest Service standards. Road maintenance would correct road segments that are contributing increased sedimentation and runoff to streams by diverting water into effective filter and

infiltration areas (Sheetz and Bloser 2008).

Table 11–Watershed hierarchy for the project and cumulative effects areas

4th field subbasin	5th field watershed	6th field subwatershed (project area acres/total subwatershed area acres)	Major streams with project boundary
Allegheny River (middle) and Tionesta Creek	Tionesta Creek	Middle Tionesta Creek (134/30,451)	
		Salmon Creek (14,441/35,043)	Salmon Creek/ The Branch/ Little Salmon Creek
		Lower Tionesta Creek (440/35,385)	Lamentation Run/Bear Creek
		Coon Run (74/26,476)	

Environmental Consequences

IM-2: Effects of proposed activities on water quality and quantity.

Direct and Indirect Effects

For Alternatives 1 and 3, 0.8 miles of road construction–new corridor is proposed. This road construction has a low risk of impacting water quality and quantity since less than 150 feet of this construction would be within 300 feet of streams. The road construction–new corridor would not cross any streams.

For Alternative 2, there are no new proposed activities on existing non-system roads, so improvements to roads that could reduce sedimentation and runoff would occur at a much slower rate than in Alternatives 1 and 3. Alternative 1 would reconstruct 7.7 miles of existing road corridors to Forest Service standards, while Alternative 3 would reconstruct 6.9 miles. About 10 of these corridors (about 2.7 miles) have crossings of ephemeral or intermittent streams, and about 0.5 miles are within 300 feet of streams. The proposed FR212Da crosses an unnamed tributary to Salmon Creek. This section of road delivers sediment laden runoff to a perennial stream, which would be reduced when commercial surfacing is applied to the stream crossing. Also, this culvert would be designed and replaced to minimize impacts to streams and allow for movement of aquatic organisms. Upgrading this road corridor to Forest Service standards and guidelines would likely reduce sedimentation to Salmon Creek in Alternatives 1 and 3.

Road maintenance is likely to occur at a faster rate in Alternatives 1 and 3 because there would be funds generated from timber sales to improve road conditions; therefore, there would be a greater reduction in sedimentation and runoff in Alternatives 1 and 3. Maintenance of Forest Service system roads within 300 feet of streams would disconnect runoff from the roads from the streams reducing potential sediment and runoff delivery. Commercial surfacing would occur to reduce the impacts of heavy truck traffic from timber hauling. It is recommended that limestone DSA be applied to roads within 300 feet of streams. Limestone DSA application may provide a beneficial effect to water chemistry through the addition of case cations (e.g. calcium and magnesium) to the local watershed. In addition, applying limestone sand to roadside ditches on existing and new roads at stream crossings would also provide increases in alkalinity.

Road decommissioning is proposed on 0.3 miles of Forest Service system roads and on 3.6 miles of non-system roads. Nine segments (1.6 miles of non-system roads) have connections to

ephemeral or intermittent streams. About 0.5 miles of non-system roads that parallel Four Mile Run within 300 feet would be decommissioned. Completion of the proposed road decommissioning would reduce sedimentation and erosion to streams and restore aquatic habitat in the project area.

Proposed timber harvest activities would include even-aged and uneven-aged management on 2,547 acres, about 18 percent of the NFS lands within the project area. Increases in streamflow are not anticipated as basal area reduction would not exceed 25 percent in the project area. In Alternative 2, basal area reductions would only be through natural process, previously approved projects, or private OGD development. No effects to stream flow are predicted as only 1.5 percent of the project area is in the zero to 10 year age class, of which the effects of regenerating stands would dissipate over the next 10 years. Over the next 20 years, the maximum increase of forest in the zero to 10 year age class would increase to 10 percent (1,475 acres) of the project area in Alternative 1 and would have less of an increase in Alternative 3. Some of the removal treatments would occur earlier in the 20 year period than the delayed removal cuts, which would separate the timing of the basal area reduction by at least five years. Due to this delay in removal cuts, the maximum basal area reduction is predicted to be 7 percent (1,027 acres) of the project area in Alternative 1 in 2021. Vegetation treatments would be spread out over a 20-yeat period and are also spread over the project watersheds.

The shelterwood removal treatments were evaluated on 21 small watersheds within the project area to determine if basal area reductions would exceed 25 percent if smaller watersheds were used. Only nine watersheds have proposed timber harvests on more than 15 acres, and the watershed areas ranged in size from 420 acres to 14,645 acres. Anticipated basal area reductions ranged from 3 to 9 percent for these nine watersheds indicating that treatments are spread across the project area.

Forest Plan guidelines require that slash, including tops and branches, be left where they are felled to retain nutrients and base cations in the stand (USDA-FS 2007a, p. 73). The extra base cations left on site would help buffer the effects of acid precipitation in soils and maintain water quality of streams within the project area.

Herbicide treatments are expected to have no effect on water quality in any alternative. Under Alternative 1, herbicide applications are proposed on 13.7 percent (up to 1,989 acres) of the project area. The majority of the herbicide treatments are located away from streams. Where treatments overlap streams or riparian areas, those resources would be protected through buffers identified in the Forest Plan (USDA-FS 2007a, pp. 57–58).

Fertilization is expected to have no effect on water quality under any alternative. Although fertilization has the potential to leach base cations from the soil profile depending on location and soil chemistry, Forest Plan stream buffers (USDA-FS 2007a, p. 71) will be applied to prevent this. Proposed fertilizer treatments may occur on 3 percent (up to 404 acres) of the project area in Alternative 1, and slightly less in Alternative 3. Since this treatment is only used when needed, less than this amount is likely to occur

The prescribed burns are expected to have minimal, short-term effects to water quality and quantity. These treatments would be spread out over several years. Prescribed burns are low-intensity and are not expected to impact water quality because revegetation occurs very quickly after this disturbance (USDA-FS 2007a, p. 3-41). Proposed prescribed burns would consume ground cover and leaf litter, but temperatures would not be high enough to burn up the organic layer of the soil or the roots, so erosion would be minimal. Low intensity fires can facilitate

nutrient cycling and may increase soil pH, but due to the limited amount of treatment expected each year no changes to water quality are expected. An estimated 13,000 gallons of water per day could be withdrawn during the prescribed burning that would be completed in 1 to 2 days every 1 to 2 years. Implementation of Forest Plan guidelines would ensure that drafting water from a stream for this and other incidental uses would maintain existing uses such as fish and aquatic life (USDA-FS 2007a, p. 76).

Ground scarification may be used along with or in place of prescribed burning and is used to promote oak regeneration. Scarification would involve a small dozer with a root rake and would take place after acorns have dropped during leaf fall. A buffer zone would be applied along streams and wetlands to avoid direct disturbances and minimize erosion near these resources. Effects are anticipated to be minimal and short term in Alternatives 1 and 3, with fewer impacts impact in Alternative 3 due to less proposed treatment acres.

The Forest Plan FEIS (USDA-FS 2007b) demonstrates minimal effects to water quantity when forestry-related activities are dispersed over the watershed. Forest Plan standards and guidelines (USDA-FS 2007a) would be applied to all proposed activities; therefore, minimal impacts on water quality or quantity are anticipated.

The addition of large wood to Little Salmon Creek proposed in Alternatives 1 and 3 would help create quality pools, slows flood flows, or store sediment and organic debris. The improvements are important for aquatic organism survival and propagation. In Alternative 2, no proposals are made and Little Salmon Creek would continue to have reduced quantities of large wood and have limited high-quality pool habitat. This riparian improvement prescription was analyzed in the Forest Plan FEIS (USDA-FS 2007b, pp. 3-22–3-51). Trees within 10 feet of the high water mark of the stream channel would not be cut. While large wood recruitment is proposed along approximately 1.4 miles of Little Salmon Creek, this activity would only occur where large woody debris is lacking and where trees are available to be felled without reducing stream shading. Therefore, it is anticipated there would be areas along this stream where trees would not be felled due to lack of trees or due to the presence of existing woody debris in the stream. Based on recent aquatic habitat inventories and expected need in this stream, it is anticipated that up to 35 trees per mile would be felled or a total of 49 trees along Little Salmon Creek.

The improvement of 19 dispersed camping sites and the closure of 35 dispersed camping sites in the project area would minimize impacts to soil and water resources. The majority of these sites are located along Salmon Creek and The Branch. Stream restoration is proposed along 2,000 feet of Salmon Creek and 400 feet of The Branch to stabilize eroding streambanks. This proposal would reduce compaction and eroding along these streams, as well as improve aquatic habitat. There would be short-term disturbance, but the aquatic habitat and water quality is expected to improve after completion of these proposals. In Alternative 2, there are no treatments proposed and the streambanks would continue to erode and contribute sediment to Salmon Creek and The Branch.

Cumulative Effects

Under Alternative 2, there would be no beneficial or negative impacts to water quality or water quantity as this alternative does not propose activities. Under Alternatives 1 and 3, the maintenance of haul routes and the addition of commercial DSA proposed in this project are expected to mitigate effects on water quality that may occur from the increase road traffic to haul timber in the cumulative effects analysis area. These activities would reduce the hydrologic connectivity of the road network to streams, thereby reducing the contribution of roads to storm water runoff and sedimentation in streams.

The primary concerns for water quality and waster quantity in the Salmon Creek watershed are roads and their potential to deliver sediment to streams and create barriers to fish passage. About 0.8 miles of road construction–new corridors is proposed in Alternatives 1 and 3. These new roads have a low risk of causing water quality problems because there would be no new stream crossings and less than 150 feet of road would be constructed within 300 feet of streams; therefore, impacts to water quality and streamflow are not anticipated. The road construction would increase soil compaction locally but would have minimal effects in the watersheds as approximately 3.4 acres would be disturbed in Alternatives 1 and 3. This is not expected to cause negative changes to streamflow since streams and wetlands would be avoided. Road construction activities would follow Forest Plan standards and guidelines and Pennsylvania BMPs to minimize the extent of these impacts.

There may be improvements in stream conditions where proposed toad construction occurs on existing corridors because commercial surfacing would be applied and runoff concerns would be mitigated. Sediment reductions would be greatest on the proposed reconstruction of the 0.5 miles of road within 300 feet of streams in Alternatives 1 and 3. Since these roads would not be improved in Alternative 2, water quality benefits would be slightly less.

Based on implementation of timber harvest activities in Alternatives 1 and 3, in combination with approved and future Forest Service and private activities, cumulative effects to water quality and quantity within the project area are expected to be minimal. In Alternative 1, even-aged harvests are proposed on 4 percent of the cumulative effects analysis area. Approximately 44 acres af timber harvests have been approved previously and 1,337 acres are expected to be approved within the cumulative effects analysis area on NFS lands and an estimated 1,537 acres is expected over the 20 years on private lands. This increases the maximum amount of forest in the zero to 10 year age class to 13 percent. Therefore, increased streamflow is not anticipated as basal area reductions would not exceed 25 percent in the cumulative effects analysis area. This amount would reduce to 7.9 percent in 2032. In Alternative 2, no effects to streamflow are predicted as no proposals from this project would be implemented. The effects from Alternative 3 would be slightly less than Alternative 1.

Cumulative effects on water quality from herbicide treatments are not expected in any alternative. The majority of these treatments are located away from streams. Those stands that overlap riparian areas or wetland management zones would be protected through herbicide buffers identified in the Forest Plan (USDA-FS 2007a, pp. 57-58).

There are currently an estimated 877 oil and gas wells impacting 877 acres of NFS and private lands within the cumulative effects analysis area. Over the next 20 years, approximately 727 new shallow wells (945 acres) and up to four deep wells (up to 40 acres) could be developed on NFS and private lands in the cumulative effects analysis area. In 2032, it is predicted that up to 4 percent (1,862.5 acres) of the cumulative effects analysis area could be impacted by OGD. This includes an estimate of the acreage in well pads, roads, tank batteries and associated utility rights-of-way. This area of impact would decrease over time after the initial development phase is over to about half of the disturbed area as the edges of roads and wells and the entire surface of buried pipelines revegetate.

The proposed activities in Alternatives 1 and 3 and the previously approved activities in all alternatives are not anticipated to cause measurable changes to water quantity of streams or ground water. Surface water may be withdrawn from streams within the project during the proposed prescribed burning in Alternatives 1 and 3. An estimated 13,000 gallons of water per

day could be withdrawn during the proposed prescribed burning that would be completed in 1 to 2 days every 1 to 2 years. Implementation of Forest Plan guidelines would ensure that the drafting of water from a stream for this and other incidental uses would maintain existing uses such as fish and aquatic life (USDA-FS 2007a, p. 76)

Water quantity impacts within the project area may occur as part of the exercise of private mineral rights. Specific data regarding the number of future wells that may be developed, their water requirements for hydraulic fracturing, and the sources of water that will be used for hydraulic fracturing are not available; therefore, the impacts of private OGD on water quantity may only be discussed in general terms.

The water used for hydraulic fracturing is typically hauled from a Pennsylvania Department of Environmental Protection (DEP) approved surface or groundwater withdrawal site. In the cumulative effects analysis area, there are five groundwater withdrawal wells for oil and gas fracturing activities. There is a well located in the headwaters of Four-Mile Run and a well located in the headwaters of Little Salmon Creek. Also, there are three wells located along The Branch. Surface water withdrawal for hydraulic fracturing is also a possibility and could potentially be withdrawn from Salmon Creek or The Branch. These streams are not listed by the Commonwealth as impaired (PA-DEP 2010).

Shallow wells generally use between 30,000 and 50,000 gallons of water for fracturing (Kuzma and Gleason 2009, personal communication. In the cumulative effects analysis area, we predict that the construction of an average of 32 wells per year that would use a total of 1,817,500 gallons per year. Withdrawal of surface water typically occurs at larger streams for ease of pumping and to minimize the effects to the stream. Salmon Creek above the confluence with The Branch has a 10-year base flow of 30.4 cubic feet per second or 19,647,982 gallons per day and The Branch, 6,721,678 gallons per day. Assuming operators would withdraw water for only 1 well per day at 50,000 gallons per day; this represents 1 percent of the 10-year baseflow of Salmon Creek and The Branch. Base flow is the part of the streamflow attributed to ground-water discharge into a stream, without surface runoff, and is described here as the mean annual flow expected to occur every 10 years.

Marcellus shale well pads may use three to five million gallons of water (Kuzma and Gleason 2009, personal communication). Assuming that a shale well developer would pump about 250,000 gallons per day, this would represent about 1 percent of the 10-year baseflow of Salmon Creek and about 4 percent of The Branch. While water withdrawal for these wells may represent a higher percentage of in-stream flow, Marcellus shale well developers are required to submit water management plans to the Pennsylvania DEP whether the water is withdrawn from local sources or hauled in. The Pennsylvania DEP reviews these plans for individual and cumulative impacts and will not approve plans unless sufficient water remains to maintain existing and designated uses.

Pennsylvania BMPs set guidelines for road and well pad construction for oil and gas developers to control erosion, sedimentation, and impacts to streamflow regimes. Protection of water resources would be accomplished by providing buffers from streams and wetlands and controlling erosion and runoff from roads, particularly at stream crossings. Although these conservation measures are effective at reducing effects, sediment and increased runoff could reach streams and wetlands, wherever they are crossed. Potential for sedimentation would be the greatest during construction and would lessen once areas are stabilized. Both older and newer wells would need to be monitored to ensure that Pennsylvania BMPs are being maintained.

Private timber activities in the cumulative effects analysis area drainages are expected within the next 20 years. Pennsylvania BMPs for road construction and timber harvesting would minimize effects to water resources (PA DEP 2005).

Implementation of all federal activities would be consistent with Federal and State laws and Forest Service regulations and handbooks. This project also involves the construction of new roads and the maintenance of existing roads. The Forest service (ANF) would consult with the Pennsylvania DEP and other federal agencies to determine whether permits are required. Design criteria and application of Pennsylvania BMPs during project implementation would ensure that effects from the project would have no adverse effects to water resources.

Table 12–Effects of proposed activities on water quality and quantity

Proposed Activity	Alternative 2–No Action	Alternative 1–Proposed Action and Alternative 3
Miles of existing road within 300 feet of a stream reconstructed	No existing road corridors would be reconstructed. These non-system roads would continue to contribute high levels of runoff and sediment to streams.	In both action alternatives, about 0.5 miles of existing road within 300 feet of streams would be reconstructed, reducing a sediment source.
Miles of new road constructed within 300 feet of a stream	No new roads would be constructed within 300 feet of a stream.	In both action alternatives, about 150 feet of new road would be constructed within 300 feet of a stream. Due to this segment's location, there is a low possibility of increased runoff reaching the stream.
Miles of road decommissioned within 300 feet of a stream	No roads would be decommissioned within 300 feet of a stream.	In both action alternatives, about 1.6 miles of road would be decommissioned within 300 feet of streams, which would reduce runoff to streams and restore riparian and stream habitat.
Even-aged treatments resulting in basal area reductions	Basal area reductions would occur through natural processes, previously approved projects and OGD development. No effects are anticipated as basal area reductions are less than the 25 percent.	Proposed even-aged timber harvests would reduce basal area within the project area by up to 10 percent and within the cumulative effects analysis area by up to 4 percent. Therefore, no measurable effects in water quantity are anticipated as basal area reductions are less than or equal to 13 percent in the cumulative effects analysis area from even-aged timber harvests on private and NFS lands. Potential OGD would bring the total basal area reduction up to 18.5 percent. Basal area reduction would decline to 13 percent by 2032.
Proposed Activity	**Alternative 2–No Action**	**Alternative 1–Proposed Action and Alternative 3**

Miles of large wood recruitment in streams	Little Salmon Creek would continue to have reduced quantities of large wood and have limited high-quality pool habitat.	Large wood and in-stream structures would be added to streams (Little Salmon Creek, Salmon Creek, and The Branch), which would increase stream channel complexity and improve aquatic habitat.
Miles of constructed in-stream structures in Salmon Creek and The Branch	Eroding stream banks along Salmon Creek and The Branch would continue	Large wood and in-stream structures are expected to disperse flood flows, trap sediment, and create deeper pools. Large wood placement may cause some localized erosion, but it is not expected to divert streams or increase flooding. In-stream structures would stabilize eroding banks.
Note: *For basal area reduction,* ***Alternative 3*** *would have the slightly lower effects as Alternative 1 but effects are not expected to be measurable.*		

Air Quality

Analysis Framework

The Clean Air Act, last amended in 1990, requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants (US EPA 2011). These "criteria pollutants" are commonly found, can be hazardous to human health and the environment, and can potentially cause property damage. The EPA regulates these six pollutants by setting scientifically-based permissible levels. The six criteria pollutants identified by the EPA are ground-level ozone (O_3), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter ($PM_{2.5.}$ and PM_{10}), and lead (Pb).

Ozone, which occurs naturally in the stratosphere, protects life on Earth. However, ground level ozone (smog) is harmful and created by a chemical reaction between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. The proposed activities which may create ozone include motor vehicle exhaust and gasoline vapors from timber harvest and oil and gas activities. Pennsylvania ozone levels are attributed to local influences and, to a larger extent, to ozone and ozone precursors from other states to the south and west of Pennsylvania (PA-DEP 2009).

Sulfur dioxide is a highly reactive gas, which has adverse effects on the respiratory system, and is created by fossil fuel combustion at power plants and other industrial facilities. Other sources include industrial processes, such as extracting metal from ore, and burning high sulfur-containing fuels used by locomotives, large ships, and non-road equipment. Proposed activities which may create sulfur dioxide include diesel powered equipment used during timber harvesting.

Carbon monoxide is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes over half of the carbon monoxide emissions nationwide. Other sources include construction equipment, industrial processes, residential wood burning, prescribed burning, and wildfires. Proposed activities, which may create carbon monoxide, include vehicles and equipment used for timber harvesting and prescribed fire.

Nitrogen oxides are a group of highly reactive gases for which nitrogen dioxide is the indicator. Emissions from cars, trucks, buses, power plants, and off-road equipment create nitrogen dioxide, which contributes to ground-level ozone and fine particle pollution. Particulate matter is composed of small particles and liquid droplets, which can be inhaled and affect the heart and lungs. Particulate matter that is between 2.5 and 10 micrometers are considered "inhalable coarse particles" and usually found near roadways and dusty industries. Particulate matter that is 2.5 micrometers and smaller are considered "fine particles" and found in smoke and haze. Smoke from prescribed burning and motor vehicle emissions are potential sources of particulate matter. Smoke plumes from prescribed burning with high particulate concentrations may reduce visibility at intersecting roads and highways.

Lead smelters are the leading cause of lead emissions and, to a lesser extent, waste incinerators, utilities, and lead-acid battery manufacturers. The nearest lead smelter is located in southwestern Pennsylvania, about 128 miles from the ANF.

Monitoring of the NAAQS occurs at the state level and is enforced through EPA-approved state implementation plan. The plans typically include a collection of monitoring devices throughout the state, which provide measurements of the concentrations of pollutants in the air and identify whether an area is meeting the air quality standards. Those areas that do not meet the standards are considered in "nonattainment" status and must implement strategies to reduce emissions. This analysis uses the most current information available from the Pennsylvania DEP and EPA websites and assumes that the monitoring stations, which are located in highly urbanized areas, are an overstatement of expected values on the ANF. This assumption is based on the knowledge that the combined ANF four-county population estimate of 124,003 for 2011 (Elk – 31,751, Forest – 7,589, McKean - 43,222, and Warren – 41,441) is less than half the 2011 population estimate for Erie County (280,985) (US Census Bureau 2012). The nearest EPA-approved monitoring stations for ozone, carbon monoxide, nitrogen dioxide, and particulate matter are located in Erie, Pennsylvania. In addition, there is a long-term ozone monitoring station located within the ANF on the Kane Experimental Forest (KEF) in Elk County, which is not approved for regulatory monitoring. There is an EPA-approved monitor for sulfur dioxide locaed in the city of Warren, Pennsylvania. The nearest monitor for lead is located in Beaver County (US EPA 2012c).

Environmental Consequences

IM-3: Effects of proposed activities on the attainments of National Ambient Air Quality Standards (NAAQS).

Direct and Indirect Effects

Table 12 illustrates the direct and indirect effects of prescribed fire and timber harvest and compares these emissions to the four-county area emissions.

Proposed activities that generate emissions include operation of engines used to perform silvicultural treatments and prescribed burning. For Alternative 2, there would be no prescribed fires or additional timber harvest in the project area on NFS lands and thus, no additional emissions of pollutants from prescribed fire or timber harvest.

Alternative 1 would implement the proposed activities including all silvicultural activities and prescribed burning. For timber harvest, there are 11.0 million board feet (MMBF) of timber expected to be removed in the first entry (2013–2017), 15.2 MMBF of timber expected to be removed in the second entry (2018–2022), and 5.6 MMBF in the third entry (2023–2027). The largest amount of acres prescribed burned in one year for Alternatives 1 and 3 would be 49 acres

of openings, while Alternative 1 proposes up to 526 acres of prescribed fire of forest understory and Alternative 3 proposes up to 453 acres of prescribed fire of forest understory. Alternative 3 differs from Alternative 1 in that there is a reduced amount of timber harvesting: 8.1 MMBF to be harvested in the first entry, 12.2 MMBF in the second entry, and 5.0 MMBF in the third entry.

The amount of pollutants added to the atmosphere by dispersed proposed activities listed above is not expected to exceed the national air quality standards. The impact of each activity on air quality is quickly diffused due to the amounts projected over time and space within the project area. Small sized prescribed fires are short lived, and last only a matter of hours. Burn plans would address general concerns with prescribed burning, such as reduction in visibility or to inhalation of fine particulates. Smoke management through dispersion will be addressed in the burning parameters of prescribed burn plans and employed in smoke sensitive areas to avoid concentrating smoke in population concentrated areas. This conclusion is supported by the most recent available data (US EPA 2012a) from the nearest Pennsylvania air quality monitors that have shown attainment of all NAAQS (Table 14).

Additionally, ozone is a pollutant which is measured at the KEF. While the KEF ozone monitoring station does not qualify as a NAAQS monitoring station, average ozone concentration, at the KEF monitoring station from 2009-2011 was 0.066 ppm (US EPA 2012b), which is below the NAAQS. This concentration level is the annual fourth maximum 8 hour average, as would be reported by EPA for attainment designation. Further discussion on ozone monitoring, including a graph demonstrating the downward trend of ozone measurements at the KEF from 1989-2008, can be found in the Programmatic Effects of Private Oil and Gas Activity on the Allegheny National Forest, Air Report (USDA-FS 2010c, available in the project file).

Table 13–Estimated emissions for prescribed fire, timber harvest, and private shallow traditional OGD for the project area compared to the four-county area. Emission estimates are not available beyond 2018 (USDA-FS 2005) for the four-county area.

Pollutant		Rx Fire Emissions (Tons/Year)			Timber Harvest Emissions (Tons/Year)			OGD Emissions (Tons/Year)			Four-County Emissions (Tons/Year)			Percent ANF Management of Four County Emissions		
		2012	2013	2018	2012	2013	2018	2012	2013	2018	2012	2013	2018	2012	2013	2018
Alt 1	VOC	0	13	13	0	3	3	16	17	22	9,615	8,886	7,671	0.17	0.37	0.50
	NO_x	0	5	5	1	8	10	82	86	108	10,378	10,135	9,731	0.80	0.98	1.26
	CO	0	277	277	2	24	28	173	182	226	53,571	49,613	43,018	0.33	0.97	1.23
	PM	0	27	27	0	0	1	4	4	5	3,992	4,151	4,416	0.10	0.75	0.75
Alt 2	VOC	0	0	0	0	1	1	16	17	22	9,615	8,886	7,671	0.17	0.20	0.30
	NO_x	0	0	0	1	4	3	82	86	108	10,378	10,135	9,731	0.80	0.89	1.14
	CO	0	0	0	2	10	9	173	182	226	53,571	49,613	43,018	0.33	0.39	1.55
	PM	0	0	0	0	0	0	4	4	5	3,992	4,151	4,416	0.10	0.10	0.11
Alt 3	VOC	0	11	11	0	2	3	16	17	22	9,615	8,886	7,671	0.17	0.34	0.47
	NO_x	0	4	4	1	7	9	82	86	108	10,378	10,135	9,731	0.80	0.96	1.24
	CO	0	241	241	2	20	25	173	182	226	53,571	49,613	43,018	0.33	0.89	1.14
	PM	0	23	23	0	0	0	4	4	5	3,992	4,151	4,416	0.10	0.65	0.63

Cumulative Effects

The largest emissions of ozone precursors (volatile organic compounds and nitrogen oxides) are due to private OGD (Table 13). Private OGD emissions include all the equipment from normal maintenance of operating shallow traditional wells in addition to predicted emissions from new shallow traditional well development. Increases in emissions from private shallow traditional OGD between 2012 and 2018 are due to the estimated 37 new wells per year in the project area.

Volatile organic compounds are another ozone precursor. The largest source of volatile organic compounds in all alternatives is due to private shallow traditional OGD (Table 13). Private OGD emissions are discussed in the previous paragraph. It is not expected that emissions from the ANF would have an effect on the continued attainment status for ozone in the project area.

It is expected that ozone concentrations will continue to decrease in the four-county area as measured at the KEF, since ozone precursors are predicted to be lower in 2020 than in 2010 due to improved efficiencies, which would reduce vehicle and equipment emissions per unit (USDA-FS 2005).

Particulate matter is expected to increase in the county and in the project area, while carbon monoxide levels are predicted to decrease (USDA-FS 2005). For particulate matter and carbon monoxide, the largest emissions for Alternatives 1 and 3 are due to prescribed fire. As shone in Table 14, particulate matter and carbon monoxide measurements by the Pennsylvania DEP in Erie are well below the NAAQS. Expected particulate matter and carbon monoxide emissions due to the proposed action are not expected to have an effect on the continued attainment for particulate matter and carbon monoxide in the project area.

Sulfur dioxide levels in the area are expected to continue to decrease with increased pollution controls on major emission sources and with the reduced levels of sulfur proposed for diesel and home heating oil. Emissions from non-road engines, as part of these proposed actions, are not expected to have an effect on the continued attainment status for sulfur dioxide in the project area.

Lead is not discussed in this report because none of the proposed activities would contribute to air quality emissions for this pollutant. In Pennsylvania, only portions of Beaver and Berks Counties are considered to be in nonattainment for lead as part of initial EPA designations in November, 2010 (US-EPA 2012c).

For Alternative 2, timber harvesting of 1,398 MBF per year is expected on private lands in the project area through 2032. Also for Alternative 2, in the project area, there is also proposed to be 307 MBF per year of timber harvesting on the NFS lands in 2012 and 2013, 57 MBF in 2014, and 190 MBF per year in 2015–2018, due to previously approved projects. There would be no additional emissions of pollutants other than previously approved harvesting on NFS lands and emissions from timber harvesting on private lands.

The cumulative effect of past, present and reasonably foreseeable future federal and non-federal actions are not expected to bring any of the criteria air pollutants to levels that exceed the NAAQS.

Predictions of the effects of the development of two Marcellus shale well sites, by 2022, on air quality in the project area are currently unavailable. The Forest Service (ANF) is awaiting results from a 2011 project by the US Department of Energy, National Energy Technology Lab (NETL). The NETL project conducted on-site measurements of air emissions from oil and gas exploration and production activities that may impact the ANF environment.

Recently, the Pennsylvania Department of Environmental Protection completed three Marcellus Shale Short-Term Ambient Air Sampling Reports. These reports were completed for Southwestern Pennsylvania (PADEP 2010), Northcentral Pennsylvania (PADEP 2011a), and Northeastern Pennsylvania (PADEP 2011b). None of the short-term ambient air sampling detected levels of carbon monoxide, nitrogen dioxide, or ozone above the NAAQS at any of the sampling sites. The northcentral and northeastern sites also sampled sulfur dioxide, and neither site detected levels above the NAAQS. The studies did not review potential cumulative emissions from development of Marcellus gas and oil plays.

On April 17, 2012, the US EPA administrator signed a notice announcing the final rule: "Oil and Gas Sector: New Source Performance Standards and National Emissions Standards for Hazardous Air Pollutants Reviews" (US EPA 2012d). These rules include the first federal air standards for natural gas wells that are hydraulically fractured to reduce the harmful air pollution from the oil and natural gas industry (US EPA 2012e). There are also requirements in the rule for several other sources of pollution in the oil and gas industry that are not regulated at the federal level. A significant reduction in volatile organic compounds emitted from new hydraulically fractured wells is expected from this rule (US EPA 2012e).

It is not expected that emissions from current and future Marcellus well development in the project area would exceed any of the NAAQS.

Table 14–Criteria pollutant monitoring data, NAAQS compared to Pennsylvania DEP measurements

Criteria Pollutant	Primary National Ambient Air Quality Standard[a] (Averaging Time)	2009 Pennsylvania DEP Bureau of Air Quality Air Monitoring Data[a]	Attainment
Ozone	0.075 ppm (8 hour)	0.073[b] ppm	Yes
Sulfur dioxide	0.03 ppm (24 hour)	0.004[c] ppm	Yes
Carbon monoxide	9.0 ppm (8 hour)	1.1[b] ppm	Yes
Nitrogen dioxide	0.053 ppm (1 hour)	0.007[b] ppm	Yes
Particulate matter (PM_{10})	150 µg/m^3 (24 hour)	47[b] µg/m^3	Yes
Particulate matter ($PM_{2.5}$)	15.0 µg/m^3 (Annual)	10.7[b] µg/m^3	Yes
Lead	0.15 µg/m^3 (3 month average)	0.09[d] µg/m^3	Yes

[a] *µg/m^3 equals micrograms per cubic meter*
[b] *Monitor located in Erie, Pennsylvania*
[c] *Monitor located in Warren, Pennsylvania*
[d] *Monitor located in Beaver County, Pennsylvania*

Wildlife and Plants

Analysis Framework

General effects to wildlife and their habitat are discussed in the ANF Forest Plan FEIS (USDA-FS 2007b, pp. 3-179–3-295). Site-specific effects to wildlife and their habitat are discussed in detail in the biological evaluation/wildlife report (BER) (located in project file) and project biological assessment (BA) (Appendix C). The effects analyses presented in these documents evaluate the effects of the proposed action on Management Indicator Species (MIS), threatened, endangered and sensitive species, and other species with viability concerns. On a landscape scale, the diversity of plant and animal life present in the project area is dependent upon the availability of habitat and various forest structural stages, composition and patterns. The wildlife report

analyzes habitat structure including early structural and mid-structural conditions as well as older forests. Habitat compositions including oak forest, conifer components, openings, streams, and wetlands are analyzed as well as habitat patterns, such as connectivity and remote habitat. Collectively, these documents assess the effects to wildlife and their habitat that would be expected to occur under each of the alternatives analyzed.

Effective December 20, 2011, the ANF Regional Forester's Sensitive Species (RFSS) list was updated based on coordination with the Regional Office. This review of available information and subsequent species viability evaluations resulted in a finalized list of 81 RFSS for the ANF. In addition, there are 10 species, which have viability concerns and are not included on the RFSS or threatened or endangered lists. There are eight Federally-listed and one candidate species analyzed in the project BA. Since completion of the Forest Biological Evaluation in 2007, the US Fish and Wildlife Service has designated the raybean and snuffbox as endangered under the Endangered Species Act on February 14, 2012 and the sheepnose was designated as endangered on March 13, 2012. A summary of the determinations for these species are shown in Table 18.

Environmental Consequences

IM-4: Effects of proposed activities on habitat fragmentation.

This indicator measure was analyzed using a patch analysis model. Patch Analyst for Arc GIS (Rempel 2008) was used to calculate and display forest patches and corridors across the landscape. This model was adapted for use on the ANF. For this analysis, a core (habitat) area or "patch" is a landscape area consisting of un-fragmented mature forest (stands with a year of origin before 1992), young forest (stands with a year of origin after 1991), or open habitat (forest types 97, 98, and 99, which are openings). The areas where the effects of fragmentation are located within the project area are displayed as bare or "white space" in Figures 1–4 and include areas within 300 feet of roads (long -term), pipelines (long-term), well sites (long-term), and final regeneration harvests (short-term).

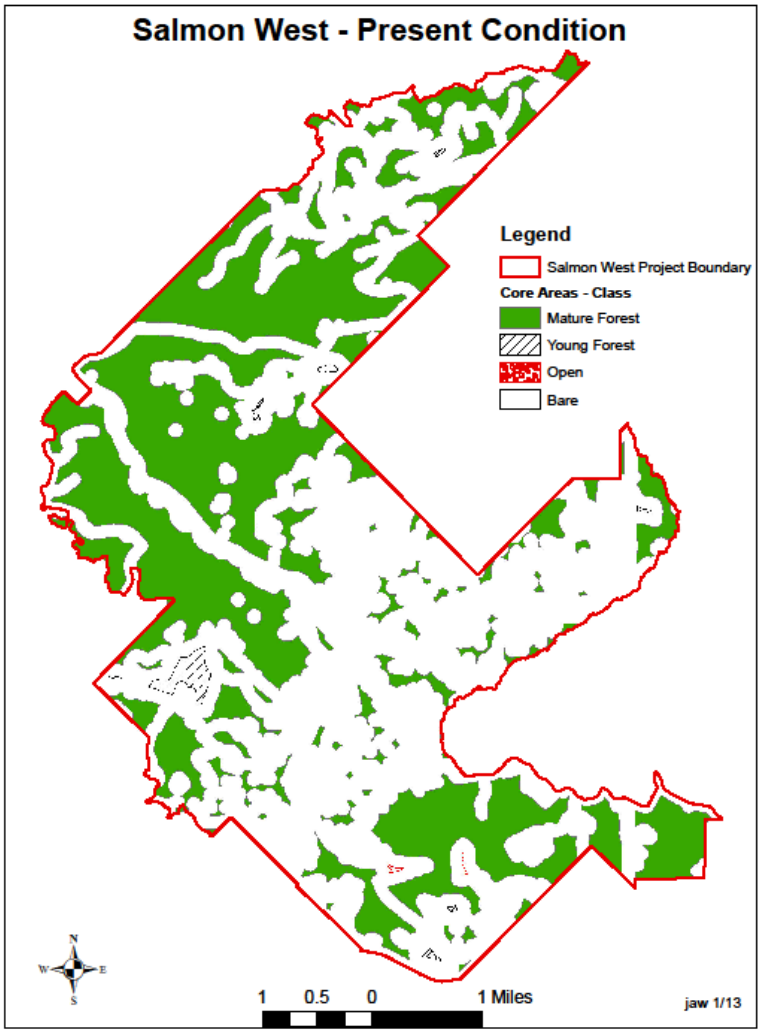
Variables used to analyze fragmentation effects include:

- Total core area – total of all the patches (acres) and includes mature forest, young forest, and open patches.
- Total core area of mature and young forest – total of all patches of mature and young forest (acres)
- Number of patches – the number of patches on the landscape.
- Mean patch size – calculation of the average patch size (in acres).
- Total edge – perimeter of all the patches (miles).

Direct and Indirect Effects

The analysis of direct and indirect effects focuses on the project area. The proposed activities that are taken into account include those activities that create early structural habitat (or young forest) in relation to the core area habitat patches.

Currently, there are 5,869 acres of core area (total of all the patches), in 92 patches, with a mean patch size of 64 acres, and the largest patch being 1,175 acres in size. Total edge is 137 miles. "Mature forest" (greater than 20 years of age) makes up approximately 5,765 acres of the total core area and young forest core makes up 99 acres of the total core area. Patch size ranges for 1 acre to 1,175 acres. See Figure 1.



Note: Bare or "white space" in the figure are areas that are considered fragmented in the patch analysis.

Figure 1–Existing condition for project area

For Alternative 2, none of the proposed activities would occur; therefore, no additional young forest would be created. Indirectly, forested stands will continue to grow and increase core habitat patch size. Approximately 44 acres of approved even-aged final harvests (from the FY06 and FY07 Regeneration EAs) would occur when advance regeneration becomes established in these stands.

For Alternative 1, an estimated 1,380 acres of young forest would be created through even-aged final harvests and 0.8 miles of road construction – new corridor would occur. Proposed activities would reduce the total core area by 16.6 percent to 4,893 acres, reduce the mean patch size by 23.4 percent to 49 acres with the largest patch being 945 acres in size, and increase the number of patches to 99. Total edge would decrease by 2.2 percent to 134 miles. Young forest core would increase to 216 acres.

For Alternative 3, an estimated 1,118 acres of young forest would be created through even-aged final harvests and 0.8 miles of road construction – new corridor would occur. Proposed activities would reduce

the total core area by 12.4 percent to 5,141 acres, reduce the mean patch size by 12.5 percent to 56 acres with the largest patch being 1,119 acres in size, and the number of patches would remain the same as in the no action alternative at 92. Total edge decreases by 2.9 percent to 133 miles. Young forest core would increase to 167 acres.

Table 15–Summary of patch analysis direct and indirect effects by alternative compared to the existing condition in 2012 in the project area

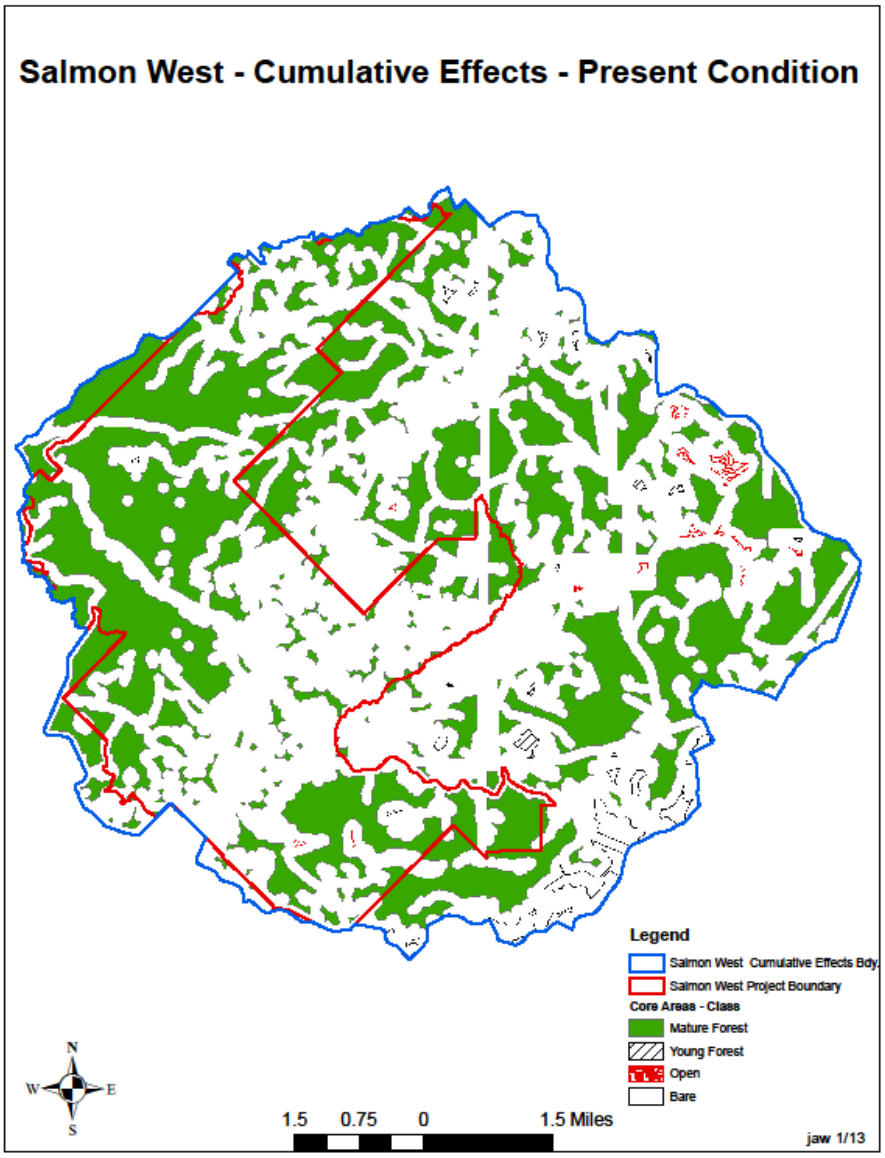
	Total core area (acres)[a]	Number of patches	Mean patch size (acres)	Largest patch size (acres)	Total edge (miles)
Existing condition and Alternative 2–No Action	5,869	92	64	1,175	137
Alternative 1–Proposed Action	4,893	99	49	945	134
Alternative 3–The Branch	5,141	92	56	1,119	133

a. Total core area is the sum of all mature forest, young forest, and open patches.

Cumulative Effects

For all alternatives, approved even-aged final harvests from the FY06 and FY07 Regeneration projects would occur within the cumulative effects analysis area through 2032 and were analyzed along with the proposed activities using patch analyst. Except for a proposed Marcellus shale wellpad off of FR399, future OGD is not included in this analysis because it is not possible to accurately predict were the future OGD would occur within the project and cumulative effects analysis areas. Over time, forest stands will continue to grow and potentially increase core habitat patch size.

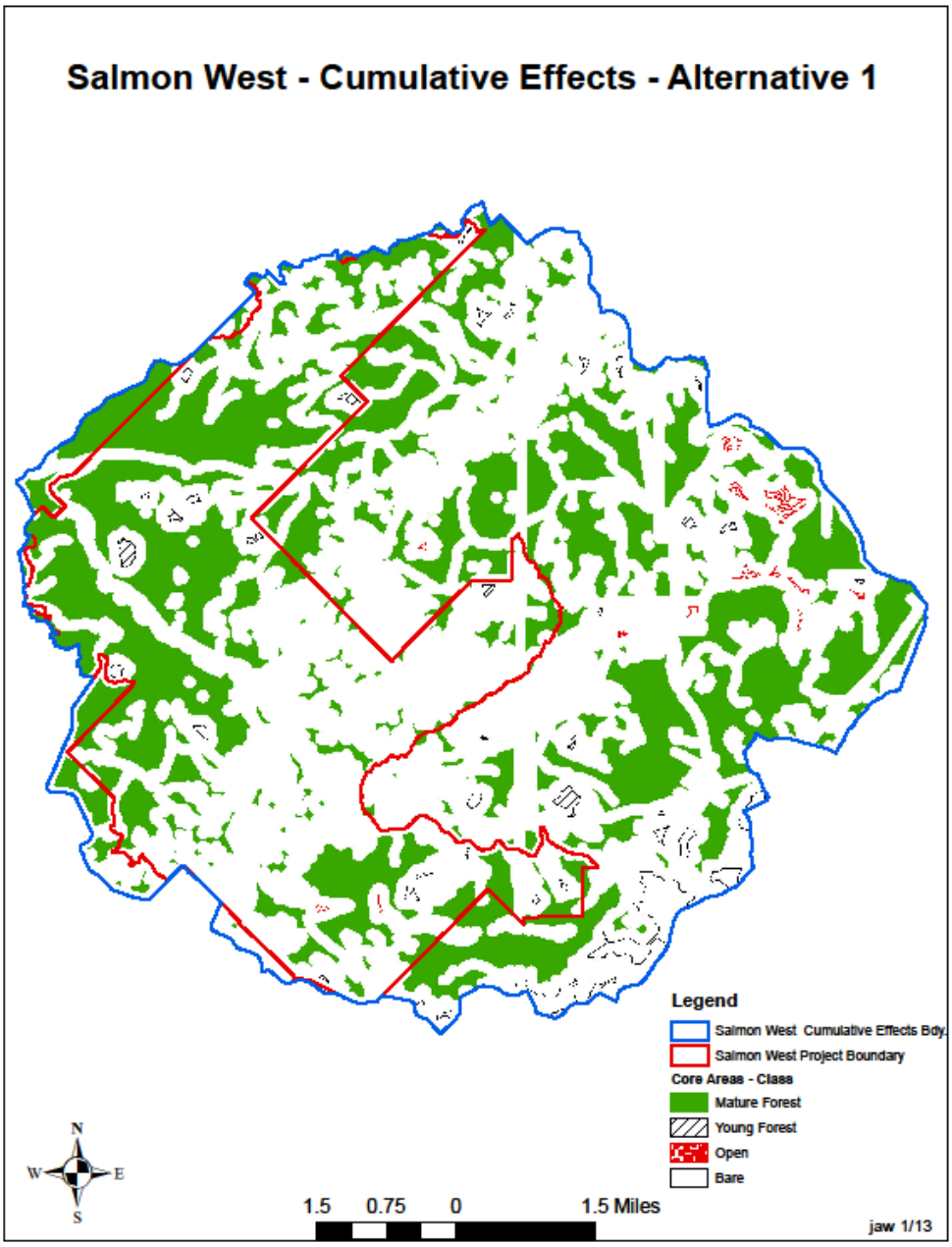
For Alternative 2, none of the proposed activities would take place. Total core area for the cumulative effects analysis area is 13,667 acres with 194 patches and a mean patch size of 70 acres (See Figure 2). The largest patch is 1,644 acres. Total edge is 328 miles. There would be approximately 13,081 acres of the mature forest core area and 93 acres of young forest core area.



Note: Bare or "white space" in the figure are areas that are considered fragmented in the patch analysis.

Figure 2–Patch analysis results of cumulative effects in Alternative 2

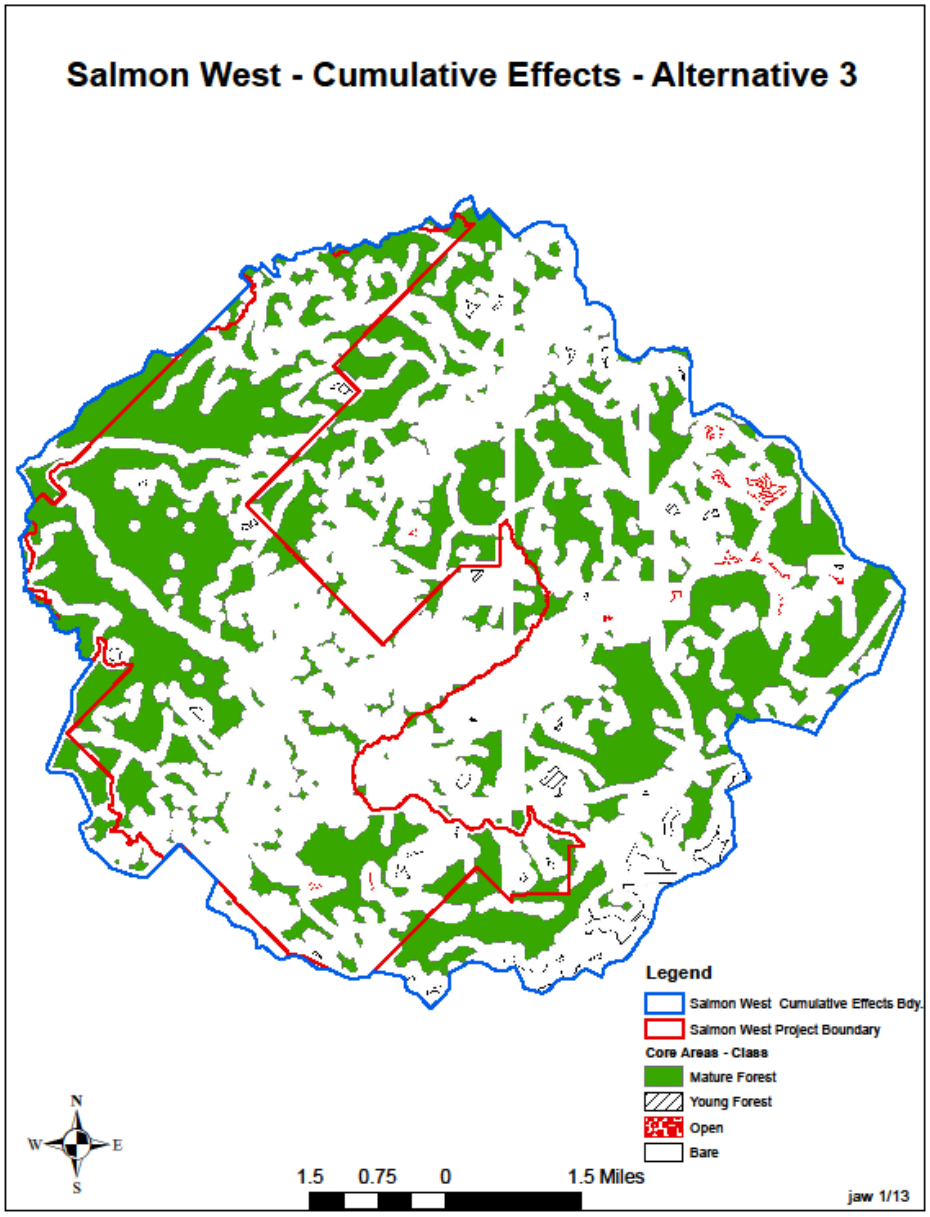
For Alternative 1, when compared with the existing condition, the proposed and previously approved treatments would reduce the total core area by 7.9 percent to 12,583 acres, reduce the mean patch size by 10 percent to 63 acres with the largest patch being 1,275 acres in size, and increase the number of patches to 199 (see Figure 3). Total edge stays the same at 328 miles. There would be approximately 11,868 acres of the core mature forest area and young forest core area would increase to 196 acres from 93 acres.



Note: Bare or "white space" in the figure are areas that are considered fragmented in the patch analysis.

Figure 3–Patch analysis results of cumulative effects in Alternative 1

For Alternative 3, proposed and previously approved treatments would reduce the total core area by 6.5 percent to 12,785 acres, reduce the mean patch size by 5.7 percent to 66 acres with the largest patch being 1,275 acres in size, and the number of patches stays the same at 194 (see Figure 4). Total edge decreases by 0.9 percent to 325 miles. There would be approximately 12,179 acres of mature forest core area and young forest core area would increase to 149 acres from 93 acres.



Note: Bare or "white space" in the figure are areas that are considered fragmented in the patch analysis.

Figure 4–Patch analysis results of cumulative effects in Alternative 3

Based on the analysis, mature forest core areas are retained under all of the alternatives, but would be reduced more in number, distribution, size, and shape under Alternative 1 than Alternative 3. This is not unexpected in MA 3.0, which strives for a diversity of age classes. Each alternative provides young forest and interior forest habitat, but at different levels, size, shape, and distribution. Suitable habitat would be provided in all alternatives for wildlife species, such as the northern goshawk and timber rattlesnake, which utilize interior mature forest habitat. Alternatives 2 and 3 provide more mature forest core area, larger patch sizes, less convoluted

patch shapes, less habitat isolation, and more habitat linkages than Alternative 1. Under Alternative 1, species that utilize younger forest and tolerate greater levels of disturbance would likely see greater benefits than in Alternative 2 or 3.

Table 16–Summary of patch analysis cumulative effects by alternative compared to the existing condition in 2012 in the cumulative effects area

Cumulative Effects w/in Cumulative Effects Analysis Area	Total core area (acres)[a]	Number of patches	Mean patch size (acres)	Largest patch size (acres)	Total edge (miles)[b]
Existing condition and Alternative 2–No Action	13,667	194	70	1,644	328
Alternative 1–Proposed Action	12,583	199	63	1,275	328
Alternative 3–The Branch	12,785	196	66	1,275	325

[a] *Total core area is the sum of all mature forest, young forest, and open patches.*

Threatened, Endangered, and Regional Forester Sensitive Species

For the threatened and endangered species and for 61 of the Regional Forester Sensitive Species (RFSS) based on habitat availability in the project, species requirements, and documentation records, the project area presently has no occupied habitat for these species. The mature deciduous and mixed deciduous and conifer forest habitats, openings, and wetlands found in the project area provide suitable but unoccupied habitat for three threatened and endangered species (Indiana bat, small whorled pogonia, and northeastern bulrush) (see Appendix C). The project area is considered occupied habitat for 20 RFSS.

The streams, riparian areas, and wetlands, along with mature deciduous and mixed deciduous/conifer forest found in the project area currently provides suitable but unoccupied habitat for 45 RFSS (see project BER, in project file). Although suitable habitat would be altered by vegetation management and transportation activities, none of these 45 species would be directly impacted as the suitable habitat in the project area is currently unoccupied. Forest habitat would be lost or converted to non-forest with the proposed 0.8 miles of road construction (under either action alternative) and stone pit expansion (6.5 acres under Alternative 1 and 5 acres under Alternative 3. An additional 863 acres (approximately 6 percent) of the project area may be impacted by future OGD. Even with this conversion of habitat, at least 78 percent of the project area would maintain forest conditions through 2032. Forest Plan standards and guidelines, Pennsylvania BMPs, and project design features are expected to help conserve important habitat features for these species.

Another 16 RFSS and four endangered species (clubshell, northern riffleshell, rayed bean, and rabbitsfoot mussels) are associated with medium to large-size stream, river, and reservoir ecosystems, have not been documented in the project area, and have no suitable habitat in the project area. No impact to these species are anticipated.

A **may impact individuals, but not likely to cause a trend toward federal listing determination or loss of species viability** was reached for 14 RFSS. With implementation of Forest Plan standards and guidelines, Pennsylvania BMPs, and project design features, no adverse long-term impacts are anticipated on any federally –listed threatened or endangered species or any RFSS that would cause a trend toward federal listing or loss of species viability or critical

habitat.

Management Indicator Species and Species with Viability Concerns

Management indicator species (MIS) are used in concert with other indicators to gauge the effects of management on wildlife habitat. The five MIS on the ANF are the timber rattlesnake, northern goshawk, cerulean warbler, mourning warbler, and aquatic invertebrates. Species selection and rationale for MIS are provided in the Forest Plan FEIS (USDA-FS 2007b, pp. 3-194–204).

Timber rattlesnake and northern goshawk

The timber rattlesnake and northern goshawk are also RFSS. The timber rattlesnake is a species of remote deciduous forests and den sites are crucial to supporting viable timber rattlesnake populations. The northern goshawk is a species of mid- to late-structural mixed deciduous and conifer forests, often containing a diverse landscape and structural conditions. These species and their habitats are protected through implementation of Forest Plan standards and guidelines (USDA-FS 2007a, pp. 84 and 87). A **may impact individuals, but not likely to cause a trend toward federal listing determination or loss of species viability** was reached for these two species.

Cerulean warbler

The cerulean warbler is a species of mid- to late-structural oak forests with some canopy gaps and has been documented in the project area. Under Alternatives 1 and 3, there would be no adverse effects on the cerulean warbler or oak habitat. Silvicultural prescriptions are designed to maintain or improve oak habitat and for retaining preferred tree species and opening the mid-story canopies in stands proposed for treatment. This would have positive effects on cerulean warblers and desirable habitat is expected to increase under the action alternatives. In addition, a study proposal by the Northeastern Forest Research Station would be undertaken to monitor cerulean warblers in the proposed treatment areas in the project area. Prescribed burning would be conducted prior to the cerulean warblers' arrival each spring.

Aquatic invertebrates

Aquatic invertebrate diversity and relative abundance are used as indicators of aquatic habitat and water quality of streams, which are important for a diversity of fish, dragonflies, mussels, and other aquatic species. Suitable habitat exists in the project area. All named streams within the project area are classified as High Quality Cold Water Fisheries. Numerous surveys for fish and water quality monitoring have been conducted on the perennial streams found within the project area. Ongoing studies include streams that are currently being surveyed for aquatic macro invertebrates and water quality.

The Forest Plan includes standards and guidelines directed at maintaining water quality and controlling sedimentation in perennial waterways, intermittent streams, and springs and seeps (USDA-FS 2007a, pp. 74–79). Implementation of Forest Plan standards and guidelines would ensure that proposed activities do not adversely impact aquatic species or their habitat. As a result, there are no adverse direct or indirect effects anticipated on aquatic species or their habitat under any of the alternatives. Approximately 71.5 percent of the cumulative effects analysis area is NFS lands with the remaining 28.5 percent being private lands and Army Corps of Engineer lands. Effects to aquatic habitats from proposed and future Forest Service activities are minimized with the implementation of Forest Plan standards and guidelines (USDA-FS 2007a, pp. 74–79). On NFS lands, resource administrators and specialists recommend and implement conservation measures for OGD that would minimize effects to aquatic habitats. Streams would also be protected through implementation of Pennsylvania BMPs for OGD and timber harvesting on private lands.

Mourning warbler
The mourning warbler is an indicator of early structural habitat, which it uses for foraging, reproduction, and concealment or cover, and has been documented in the project area. Young forest habitat is important to many game species and a number of species with viability concerns. Currently, about 4 percent of the project area provides early structural habitat (0-20 years old).

Approximately 1,380 acres (10 percent of NFS lands) in Alternative 1 and 1,118 acres (8 percent of NFS lands) in Alternative 3 of early structural habitat would be created with proposed even-aged regeneration harvests. Early structural habitat would increase over the next two decades in Alternatives 1 and 3 and decrease under Alternative 2. By 2032, approximately 11.4 percent under Alternative 1 and 9.4 percent under Alternative 3 of the cumulative effects analysis area is expected to be early structural forest with 1.2 percent under Alternative 2. Projected OGD would increase opening (non-forest) habitat across the cumulative effects analysis area by 6 percent over the next 20 years.

Additional Species with Viability Concerns

The National Forest Management Act requires national forests to preserve and enhance the diversity of plant and animal communities to meet multiple use objectives based on the suitability and capability of the land. Migratory birds were considered in the Forest Plan FEIS (USDA-FS 2007b, p. 3-208) and included as part of the species viability evaluation. Migratory birds that occur on the ANF and were determined to have viability concerns were analyzed as part of the species viability evaluation process. The rationale and process for determining the status and listing of species and the forest-wide effects of management are located in the Forest Plan FEIS (USDA-FS 2007b, pp. 3-205–3-208 and Appendix E).

During Forest Plan FEIS analysis, a total of 78 species were identified with potential viability concerns for the ANF. Ten (10) of these species are protected but not included on the threatened and endangered or RFSS list for the ANF. Because their viability on the ANF was a concern, Forest Plan standards and guidelines (USDA-FS 2007a, pp. 84-89) were developed to protect these species and their habitats. Except for the Henslow's sparrow and osprey, the remaining eight species with viability concerns have suitable habitat within the project area. The list of seven birds, two reptiles and one amphibians and their status in the project area can be found in the BER (in project file).

Black-throated blue warbler, red-shouldered hawk, and raven
All of these species have been documented in the project area. These species use a combination of mature hardwoods or hardwoods mixed with conifer near riparian areas. There are several inventoried wetlands in the project area. Forest Plan standards and guidelines will protect wetlands and other water resources by reducing or avoiding impacts. In addition, at least 68 percent of the project and cumulative effects analysis area would remain mid- to late-structural habitat in 2032; therefore, suitable habitat would remain for all of these species. The conifer component (4 percent of the project area) consists of a mixture of understory, midstory, and overstory conifers and is expected to be retained in all alternatives.

The hemlock woolly adelgid poses a threat to hemlock trees within the project area. Thus, it is a potential long-term threat to some of the wildlife species that utilize mixed hardwood and conifer habitat. For the short term, suitable habitat is expected to remain for these species. Proposed conifer plantings would supplement the conifer component in the project area. Private oil and gas developers are encouraged to follow Forest Plan standards and guidelines, which protect these species and their habitat. Other than one previously identified red-shouldered hawk nest, which is

now inactive, no other raptor or raven nests are currently active in the project area. If a nest is discovered during implementation, Forest Plan standards and guidelines will be implemented to protect the existing and any new nest sites.

Osprey
There has been no documented occurrence of osprey within the project area. No suitable habitat occurs in the project area because of the absence of a large impoundment or a large river. Therefore, the project would have no adverse effects to the osprey or its habitat. Forest plan standards and guidelines would protect riparian habitat and water quality (USDA-FS 2007a, pp. 74-79).

Great blue heron
This species has been documented in the project area; however, no rookeries have been documented in the project or cumulative effects analysis areas. Suitable foraging habitat would be retained under all alternatives. Riparian areas that contain wetlands and intermittent or perennial streams will be protected with implementation of Forest Plan standards and guidelines; therefore, no adverse effects to water quality and aquatic and riparian habitats are anticipated in either alternative. Mid- to late-structural hardwood forest habitat would remain on at least 68 percent of the project area in Alternatives 1 and 3 in 2032. Large diameter trees and snags would remain throughout the project area in riparian areas; therefore, nesting opportunities would remain. In the event a rookery is discovered, Forest Plan standards and guidelines will be implemented to protect it.

Henslow sparrow
There has been no documented occurrence of the Henslow sparrow in the project or cumulative effects analysis areas. Three percent of the project area is classified as openings consisting of savannahs, riparian openings, wetlands, utility corridors, stone pits, and managed openings. Openings are found on less than 1 percent of the private lands within the cumulative effects analysis area. Implementation of Alternatives 1 and 3 would not have an adverse effect on opening habitat. In addition, 49 acres of opening rehabilitation in Alternatives 1 and 3 would maintain and enhance opening habitat within the project area. No adverse effects to this species or its habitat are anticipated under any alternative.

Golden-winged warbler
This species utilizes early structural habitat, which is expected to increase in the project area due to management activities under the action alternatives. By 2032, early structural habitat would be present on approximately 10 percent in Alternative 1 and 8 percent in Alternative 3 of the project area and less than 1 percent in Alternative 2. Shrub components within mature forest and along riparian areas are retained with implementation of Forest Plan standards and guidelines regardless of the proposed treatments or alternative implemented. There has been no documented occurrence of the golden-winged warbler within the project or cumulative effects analysis areas.

Jefferson salamander and eastern box turtle
The Jefferson salamander occurs in mature hardwood and mixed hardwood/conifer forest habitat in or near vernal pools and ponds. They can also occur in or near other water resources, but favor vernal pools, which are protected by Forest Plan standards and guidelines. The eastern box turtle typically uses forested riparian habitat. These species occur in or near a variety of aquatic habitats that are protected by Forest Plan standards and guidelines (USDA-FS 2007a, pp. 74–79 and 87). These species have not been documented in the project area. If these species are discovered, Forest Plan standards and guidelines (USDA-FS 2007a, p. 87) will be implemented to protect the

species and its habitat. Amphibian and log structures are proposed at three locations to enhance existing habitat.

Coal skink
This species typically occupies dry oak forest habitat, but can be found in other dry mature hardwood sites containing inclusions of surface rock and rubble. This habitat type may also include stone barrow pits. At least 31 stands in the project area contain areas of rock and surface rubble. Several of these inclusions are found in proposed treatment areas. This species has been documented in the project area. Forest Plan standards and guidelines provide preferential treatment for unique features, such as rock outcrops and boulder fields (USDA-FS 2007a, p.87). Project design features on pages 17 and 18 would protect this species and it habitat. In addition, rock structures are proposed at three locations to enhance reptile habitat.

Game Species
Substantial monitoring efforts regarding harvest trends, hunter distribution and pressure, health and condition of harvested animals, and local population estimates and habitat conditions have been conducted across the ANF over the last two decades. Investments have been made in wildlife habitat enhancements across the ANF that benefit game species.

The mature deciduous hardwood and seedling and sapling forest conditions in the project area provide suitable habitat for the black bear, white-tailed deer, wild turkey, ruffed grouse and woodcock. Sections of streams provide habitat for brook trout. These species have been documented in the project area. Additional early structural habitat would be created on 1,380 acres (10 percent) of the project area in Alternative 1, on 1,118 acres (8 percent) in Alternative 3, and on 0 acres in Alternative 2. The proposed regeneration of mature stands would benefit these species by providing escape and winter cover for the black bear, desirable browse for deer, nesting and brood-rearing conditions for wild turkey and breeding and foraging habitat for ruffed grouse and woodcock. Over the long-term, the establishment of additional conifer cover through planting would improve winter cover. Enhanced opening habitat is expected to improve foraging and brood-rearing habitat. There would be a small increase in opening habitat because of 0.8 miles of road construction – new corridor and 5 to 6.5 acres of stone pit expansion that would result from implementation of Alternative 1 or 3.

Final harvests would produce a shift from mature mast-producing forest to early-structural habitat on a project-scale; however, as an estimated 68 percent of the cumulative effects analysis area would continue to support mid- to late-structural habitat through the next 20 years. Proposed reforestation activities are expected to establish stands with a diverse and desirable mix of trees and shrubs, which over the long-term would support a diverse assemblage of game and non-game species.

Projected timber harvests and associated reforestation activities on NFS and private lands could affect up to 20 percent of these lands over the next 20 years. With anticipated OGD, approximately 9 percent of the forest habitat within the cumulative effects analysis area could be converted to non-forest habitat over the next 20 years (see Table 10). However, game species would continue to find suitable cover, foraging, and denning habitat within the project and cumulative effects analysis areas in either alternatives.

Cold-water streams are the primary habitat for brook trout. There are eight named streams with the project area (see Map 1). Salmon Creek, The Branch, Little Salmon Creek, Four Mile Run, and Two Mile Run support limited populations of native brook trout. Fish populations in the other streams are unknown as these streams have not been surveyed for native trout but perennial

sections appear to provide suitable habitat based on stream size and structure. No adverse indirect effects to brook trout are anticipated from proposed activities because effects to water quality and aquatic habitats from proposed Forest Service activities would be minimized with the implementation of Forest Plan standards and guidelines (USDA-FS 2007a, pp. 74–79). Over the long-term, road maintenance, surface armoring, large wood introductions, construction of the multi-faceted log complex (The Branch Stream Improvement Project), and closing, rehabilitating, and hardening dispersed campsites are expected to have positive effects on water quality, especially at point-sources of sedimentation. On NFS lands, resource administrators and specialists recommend and implement conservation measures that minimize effects to aquatic environments from private OGD. Streams are protected with implementation of Pennsylvania BMPs for OGD and timber harvesting on private lands.

All three alternatives would favor wildlife that spends part or all of its life cycle in early structural habitat. Considering the desired future condition of MA 3.0, efforts that strive to achieve a better balance of forest conditions are likely to improve forest health and resilience as well as enhance habitat for a variety of game species. Under all three alternatives by 2032, at least 53 percent of the NFS lands within the project area would be considered late-structural habitat (over 111 years of age) and at least 75 percent of the NFS lands within the project area would be considered mature forest (greater than 51 years of age).

Table 17–Summary of determinations for federally threatened, endangered, and candidate species and for Regional Forester's sensitive species

Federally threatened, endangered, and candidate species	Alternative 1–Proposed Action	Alternative 2–No Action	Alternative 3–The Branch
Indiana bat	May affect, but not likely to adversely affect	No effect	May affect, but not likely to adversely affect
Northeastern bulrush	No effect	No effect	No effect
Small whorled pogonia	No effect	No effect	No effect
Clubshell mussel	No effect	No effect	No effect
Northern riffleshell mussel	No effect	No effect	No effect
Rayed-bean mussel	No effect	No effect	No effect
Sheepnose mussel	No effect	No effect	No effect
Snuffbox mussel	No effect	No effect	No effect
Rabbitsfoot mussel (candidate species)	No impact	No impact	No impact
Regional Forester's sensitive species	**Alternative 1–Proposed Action**	**Alternative 2–No Action**	**Alternative 3–The Branch**
Amber-winged spreadwing	No impact	No impact	No impact
American emerald	No impact	No impact	No impact
American ginseng	May impact individuals, but will not cause a trend toward federal listing or loss of viability	No Impact	May impact individuals, but will not cause a trend toward federal listing or loss of viability
Awned sedge	No impact	No impact	No impact
Bald eagle	No impact	No impact	No impact
Band-winged meadowhawk	No impact	No impact	No impact
Bartram shadbush	No impact	No impact	No impact
Black-tipped darner	No impact	No impact	No impact
Bluebreast darter	No impact	No impact	No impact
Blue wild indigo	No impact	No impact	No impact
Boreal bluet	No impact	No impact	No impact

Regional Forester's sensitive species	Alternative 1–Proposed Action	Alternative 2–No Action	Alternative 3–The Branch
Boreal bog sedge	No impact	No impact	No impact
Boreal starwort	No impact	No impact	No impact
Bristly black currant	No impact	No impact	No impact
Brush-tipped emerald	No impact	No impact	No impact
Burbot	No impact	No impact	No impact
Butternut	No impact	No impact	No impact
Canada yew	No impact	No impact	No impact
Channel darter	No impact	No impact	No impact
Checkered rattlesnake plantain	May impact individuals, but will not cause a trend toward federal listing or loss of viability	No Impact	May impact individuals, but will not cause a trend toward federal listing or loss of viability
Comet darner	No impact	No impact	No impact
Creek heelsplitter	No impact	No impact	No impact
Creeping snowberry	No impact	No impact	No impact
Crimson-ringed whiteface	No impact	No impact	No impact
Eastern hellbender	No impact	No impact	No impact
Eyed brown	No impact	No impact	No impact
Four-toed salamander	No impact	No impact	No impact
Gilt Darter	No impact	No impact	No impact
Great-spurred violet	May impact individuals, but will not cause a trend toward federal listing or loss of viability	No impact	May impact individuals, but will not cause a trend toward federal listing or loss of viability
Green-faced clubtail	No impact	No impact	No impact
Green-striped darner	No impact	No impact	No impact

Regional Forester's sensitive species	Alternative 1–Proposed Action	Alternative 2–No Action	Alternative 3–The Branch
Harpoon clubtail	No impact	No impact	No impact
Hooker's orchid	May impact individuals, but will not cause a trend toward federal listing or loss of viability	No impact	May impact individuals, but will not cause a trend toward federal listing or loss of viability
Little brown myotis	May impact individuals, but will not cause a trend toward federal listing or loss of viability	No impact	May impact individuals, but will not cause a trend toward federal listing or loss of viability
Longhead Darter	No impact	No impact	No impact
Longsolid mussel	No impact	No impact	No impact
Maine snaketail	No impact	No impact	No impact
Midland clubtail	No impact	No impact	No impact
Mocha emerald	No impact	No impact	No impact
Mountain brook lamprey	No impact	No impact	No impact
Mountain madtom	No impact	No impact	No impact
Mountain wood fern	May impact individuals, but will not cause a trend toward federal listing or loss of viability	No Impact	May impact individuals, but will not cause a trend toward federal listing or loss of viability
Mustached clubtail	No impact	No impact	No impact
Northern bluet	No impact	No impact	No impact
Northern flying squirrel	May impact individuals, but will not cause a trend toward federal listing or loss of viability	No impact	May impact individuals, but will not cause a trend toward federal listing or loss of viability
Northern goshawk (also a management indicator species)	May impact individuals, but will not cause a trend toward federal listing or loss of viability	No impact	May impact individuals, but will not cause a trend toward federal listing or loss of viability

Regional Forester's sensitive species	Alternative 1-Proposed Action	Alternative 2-No Action	Alternative 3-The Branch
Northern madtom	No Impact	No Impact	No Impact
Northern myotis	May impact individuals, but will not cause a trend toward federal listing or loss of viability	No impact	May impact individuals, but will not cause a trend toward federal listing or loss of viability
Ocellated darner	No impact	No impact	No impact
Ohio lamprey	No impact	No impact	No impact
Philadelphia panicgrass	No impact	No impact	No impact
Queen-of-the-prairie	No impact	No impact	No impact
Rabbitsfoot	No impact	No impact	No impact
Rainbow (mussel)	No impact	No impact	No impact
Rapids clubtail	No impact	No impact	No impact
Riffle snaketail	No impact	No impact	No impact
Rough cotton-grass	No impact	No impact	No impact
Round pigtoe	No impact	No impact	No impact
Sable clubtail	No impact	No impact	No impact
Ski-tailed emerald	No impact	No impact	No impact
Spotted darter	No impact	No impact	No impact
Stalked bulrush	No impact	No impact	No impact
Swainson's thrush	May impact individuals, but will not cause a trend toward federal listing or loss of viability	No impact	May impact individuals, but will not cause a trend toward federal listing or loss of viability
Swamp red current	No impact	No impact	No impact
Sweet-scented Indian plantain	No impact	No impact	No impact
Threeridge	No impact	No impact	No impact
Tippecanoe darter	No impact	No impact	No impact

Regional Forester's sensitive species	Alternative 1-Proposed Action	Alternative 2-No Action	Alternative 3-The Branch
Timber rattlesnake (also a management indicator species)	May impact individuals, but will not cause a trend toward federal listing or loss of viability	No impact	May impact individuals, but will not cause a trend toward federal listing or loss of viability
Thread rush	No impact	No impact	No impact
Tri-colored bat (formerly (Eastern pipistrelle)	May impact individuals, but will not cause a trend toward federal listing or loss of viability	No impact	May impact individuals, but will not cause a trend toward federal listing or loss of viability
Tufted hairgrass	No impact	No impact	No impact
Uhler's sundragon	No impact	No impact	No impact
Wabash pigtoe	No impact	No impact	No impact
West Virginia white	No impact	No impact	No impact
White-faced meadowhawk	No impact	No impact	No impact
White heelsplitter	No impact	No impact	No impact
White Fawn-lily	May impact individuals, but will not cause a trend toward federal listing or loss of viability	No Impact	May impact individuals, but will not cause a trend toward federal listing or loss of viability
Wild Quinine	May impact individuals, but will not cause a trend toward federal listing or loss of viability	No impact	May impact individuals, but will not cause a trend toward federal listing or loss of viability
Wood turtle	No impact	No impact	No impact
Yellow-bellied flycatcher	No impact	No impact	No impact
Zebra clubtail	No impact	No impact	No impact

Non-native Invasive Plant (NNIP) Species

Analysis Framework

Surveys for the Salmon West project found 31 NNIP species infesting approximately 74 acres (refer to Appendix B and Map 5) within vegetation treatment stands, riparian areas, pits, openings, recreation areas and road corridors. Forested stands and riparian areas within this project area have the greatest amount of NNIP species infestations. Infestations of single or a small number of plants also occur along road corridors. The current amount of NNIP species infestations within areas surveyed was used to estimate the amount of NNIP species infestations for areas not surveyed based on the percent of infestation by survey area type (for example, road corridor versus forested stands). Based on these estimates there are an additional 114 acres of NNIP species treatment proposed for the project area over the next 10 to 15 years (See project file for additional information on NNIP species estimates) for a total of 188 acres of NNIP species proposed treatment utilizing a combination of manual/mechanical treatment (for example, hand pulling, clipping, digging) and/or herbicide (for example, backpack foliar, cut-stem) application of glyphosate and/or sulfometuron methyl. The method of treatment is determined by species, amount of infestation, and site conditions at the time of treatment.

Herbicide use is permitted in all management areas to treat native and non-native invasive plant species (USDA-FS 2007a, pp. 35). Herbicide treatment of NNIP species within the project area would entail the use of backpack sprayers for spot-treatment of small, scattered locations (infestation areas typically less than 10 square feet). All applications would be made by or supervised by Pennsylvania licensed pesticide applicators. Only aquatic labeled glyphosate formulations would be used in areas near surface waters with appropriate buffers as prescribed in current ANF Forest Plan standards and guidelines (USDA-FS 2007a, pp. 54-59). These standards and guidelines are based on the Human Health Risk Assessment completed for the Forest Plan FEIS (USDA-FS 2007b, Appendix G). Appendix A of the Forest Plan (USDA-FS 2007a, pp. A43-A45) contains additional information on site selection, herbicide selection, and application methods and rates. NNIP species documented within the project area are listed in Appendix B (p. B-7).

Ground disturbing activities that convert forested areas to non-forest, either grass/forb vegetation or areas with no vegetation (such as roads), are considered long-term effects by creating habitat conducive to the spread or establishment shade intolerant NNIP species, which includes the majority of NNIP species on the ANF (see project file for additional information on shade tolerance categories). Roadways are considered the primary corridors for NNIP species spread by human activities (Gucinski and others 2000). Haul roads and skid trails have been shown to be the primary conduit for the dispersal of introduced species into the interior of managed stands in upper Michigan and this study is considered to be applicable to the ANF (Buckley and others 2003). However, the factors influencing the establishment and spread of NNIP species vary by invasive plant species, habitat type disturbed, presence of a seed source, and dispersal vectors (Parendes and Jones 2000). To reduce the potential of proposed activities causing and promoting the spread of NNIP species, the Forest Service (ANF) would implement Forest Plan standards and guidelines to prevent the spread and establishment of NNIP species and includes contract provisions for equipment washing and establishing desired vegetation following ground disturbance.

Environmental Consequences

IM-5: Effects of proposed activities on causing and promoting the introduction or spread of NNIP species.

Direct and Indirect Effects

Among the proposed activities in Table 1, vegetation management and transportation activities (road construction and pit expansion) were identified in the Forest Plan FEIS (USDA-FS 2007b, pp. 3-291 to 3-295) with the most likelihood of causing and promoting the introduction or spread of NNIP species. The general effects of management actions on NNIP species are found in the Forest Plan FEIS (USDA-FS 2007b, pp. 3-291 to 3-295) and are incorporated here by reference. In summary, management actions that cause ground disturbance and opening-up of the forest canopy have the greatest potential to facilitate the introduction and spread of NNIP species on the ANF. Short-term effects are from changes in canopy cover, allowing more sunlight to the forest floor, which enhances habitat for shade intolerant NNIP species and creates more suitable growing conditions in which shade intolerant species may spread/grow. In areas of canopy disturbance, shade tolerant species take advantage of increased sunlight by increased growth and reproduction.

The current condition of NFS lands within the project area contains approximately 417 acres classified as open (3 percent) and 439.5 acres of road corridor (3.2 percent) for a total of 856.5 acres (6.2 percent) of non-forested lands within the project area. Under Alternative 2, existing NNIP species infestations would not be treated. Previously approved vegetation management on 44 acres would still occur all of which may receive herbicide treatments and if NNIP species are present in these areas they would be treated secondarily. The effects of the no action alternative on NNIP species are that untreated NNIP species infestations are anticipated to persist and spread. Proposed NNIP species treatments and associated benefits for desired plant and animal communities would not be realized under this alternative as their habitat would continue to be degraded by NNIP species.

Under Alternatives 1 and 3, vegetation management would create short-term conditions conducive to the spread of NNIP species through ground disturbance and reduction or removal of tree canopy. However, because of the temporary nature of these openings, this is expected to be a short-term effect. Generally, within 10-15 years after harvest, herbaceous and shrubby vegetation would be overtopped and less sunlight would reach the forest floor, thus reducing suitable growing conditions for shade intolerant NNIP species (with the exception of tree species such as tree of heaven). If all vegetation management was conducted at one time, an additional 1,380 acres (10 percent) of the project area would be zero to 20 years in age under Alternative 1 and 1,118 acres (8.1 percent) under Alternative 3, respectively. However, vegetation management is conducted in stages, in addition to the transition of existing early structural stands into older age classes over the next twenty years, the total amount of zero to 20 year old forest within the project area is projected to be 1,437 acres (10.4 percent) under Alternative 1 and 1,166 acres (8.4 percent) under Alternative 3 by 2032. An additional 0.8 miles (3.4 acres) of road construction–new corridor under Alternatives 1 and 3 would increase non-forested land within the project area slightly.

NNIP species infestations were found along roadways adjacent to treatment stands and within treatment stands; therefore, it is possible that logging equipment used on these sites could facilitate the spread of NNIP species by carrying seeds or reproductive fragments into non-

infested areas. In order to reduce this potential of the indirect introduction and spread off-site, an equipment cleaning provision is included in timber sale and other construction contracts.

Road construction, road reconstruction, and pit expansion create non-forest conditions and permanent edge habitat. These areas may become infested with NNIP species by natural agents, such as wind and water, as well as by vehicles and other uses. These areas of disturbance will be seeded with a desired vegetation to help reduce growing space for NNIP species, which will aid in reducing the potential for NNIP species establishment. Introduction of NNIP species seeds or reproductive fragments from equipment to and from the pit area is also a concern.

Under both action alternatives, approximately 188 acres of NNIP species would be treated to reduce or eliminate NNIP species infestation.

Cumulative Effects

The NNIP species cumulative effects analysis area encompasses the project area (15,090 acres) and includes the stone pits located on FR523 and FR576A that are proposed for expansion. This cumulative effects analysis area was deemed to be of adequate size based on the type, amount and distribution of the proposed activities. Enlarging the cumulative effects analysis area beyond the project area boundary would dilute the possibility of detecting any cumulative effects to NNIP species from Forest Service and non-Forest Service activities within the project area. The time-frame for the cumulative effects analysis is (2012-2032). Within 20 years it anticipated that proposed activities would be completed and areas with vegetation management activities would have developed closed canopy conditions. Cumulative effects related to NNIP species are evaluated by assessing the current condition and proposed and reasonably foreseeable activities on NFS lands.

Based on the analysis presented under the direct and indirect effects section, activities most likely to result in spread and establishment of NNIP species from Forest Service management activities within the cumulative effects analysis area include: (1) short-term effects (10 to 15 years) from timber harvesting and (2) long-term effects from road construction. Up to 1,380 acres (10 percent) of regeneration final harvests and 0.8 miles (3.4 acres) of road construction would also occur within the cumulative effects analysis area (project area).

Non-federal activities most likely to result in introduction and spread of NNIP species include short-term effects from vegetation management on private land and long-term effects from private OGD activities that convert forest to non-forest.

Up to 6.5 acres of pit expansion is proposed in Alternative 1 and up to 5 acres, in Alternative 3 would be implemented including three stone pits, which are located outside of the project area on FR523 and 576A. This expansion would convert up to 6.5 acres into a non-forested opening and would create new edge habitat. This may become infested with NNIP species by “natural agents” such as wind and water, as well as by vehicles and other uses. This area of disturbance will be seeded with a native seed to establish desired vegetation quickly, which will aid in reducing the potential for NNIP species to become established. Introduction of NNIP seeds or reproductive fragments from equipment to and from the pit area is also a concern. In order to reduce the potential spread of NNIP species in these areas, surveys and treatments would occur prior to expansion, as well as equipment cleaning before work begins.

Approximately 1,239 acres of privately owned land is located within the project boundary. Based on an analysis of aerial photographs, approximately 9 acres can be categorized as herbaceous openings, and 195 acres are currently zero to 20 years old. Based on Forest Plan projections for

private, non-industrial land, approximately 391 acres of vegetation management could be expected to occur on these lands over the next twenty years. Land conversion from residential development is not anticipated to occur within these private lands in the next 20 years based on past and current levels of residential development.

Future OGD on both private and NFS lands would have the greatest potential for ground disturbance and increased activity in both the short- and long-term within the project area. Based on projections for future OGD within the project area, 633 shallow wells and 4 deep wells could be constructed over the next twenty years. These wells would result in the conversion of approximately 863 acres into non-forested permanent openings.

At the present time, approximately 926 acres (6.1 percent) within the project area are categorized as non-forest. Non-forested lands are projected to occur on up to 11.8 percent of the project area under any Alternative as 1,793 acres under Alternative 1, 1,791 acres under Alternative 3, and 1,789 acres under Alternative 2 by 2032. As can be inferred from these projections, the proposed road construction would result in a very small increase of the total amount of non-forested land within the cumulative effects area over the next twenty years. In addition, even when factoring in the four acres of gravel pit expansion, OGD is projected to be the predominant cause of non-forested opening creation throughout the cumulative effects area.

Heritage

Analysis Framework

Seventy-seven (77) historic and/or prehistoric sites have been identified within the project area. None of the 77 sites have been evaluated for nomination to the National Register of Historic Places (NRHP). Until evaluated, cultural resources are managed as though they have been determined eligible. Known cultural resources within the project area will be avoided or mitigated.

Environmental Consequences

IM-6: Effects of the proposed activities on cultural resources.

Direct, Indirect, and Cumulative Effects

No direct, indirect, or cumulative effects to cultural resources are anticipated from the proposed activities under any alternative. Cultural resources will be avoided through project design or the use of no-treatment buffers. Where avoidance is not possible, protective measures would be implemented to ensure there are no effects to cultural resources or they are mitigated. Forest Plan standards and guidelines and other resource protection measures (see Section II) have been successfully applied on the ANF for many years to protect cultural resources. Cultural resources, including those that have not been evaluated for the NRHP, are afforded protection with no-treatment buffers or the proposed activities have been designed to avoid affecting them.

Cultural resources and sites would be protected, avoided, or mitigated under all alternatives. Future projects, including private OGD will be reviewed to ensure that cultural resource sites are protected. Future activities would be designed to avoid or mitigate effects to cultural resources. Therefore, there are no anticipated cumulative effects to cultural resources from proposed or reasonably foreseeable activities in any alternative.

Recreation Opportunities and Forest Settings

Analysis Framework

The Recreation Opportunity Spectrum (ROS) is a framework used for planning and managing recreational opportunities by distinguishing the varying conditions and qualities in the landscape. Indicators such as access, site management, visitor management, social encounters, and visitor impacts help to determine ROS settings. Recreational settings are arranged along a continuum of six ROS classes progressing from least to greatest development: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural and urban. On the ANF, ROS classes range from semi-primitive, non-motorized to rural. The project area currently contains roaded natural (12,804 acres), roaded natural – modified (586 acres), and rural (485 acres) ROS settings. The desired ROS classification for the project area is also roaded natural.

In 2005, the district recreation staff surveyed existing dispersed campsites and recorded GPS locations on 38 sites on River Road between Irwin Run Canoe Launch, where River Road meets the Clarion River, and where Dark Hollow Run flows into the Clarion River. Another 8 sites were located up Millstone Creek from Clarion River. These 46 sites were evaluated for location and condition and the decision was made to close based on the following criteria:

- Sites on private land
- Sites too close to private land
- Sites without adequate room for parking off the road
- Sites between the river and the road where erosion is occurring
- Sites where camping activities could damage known archeological resources

Since then, the district has continued to evaluate dispersed campsites based on David Cole's research on campsites in designated wilderness areas (Cole 1989a and 1989b). This research measures site indicators such as amount of barren ground, amount of area that has changed from sensitive to resilient species, number of user-created improvements, amount of tree damage, amount of trash, and amount of human waste sites. However, research by Leung and Marion suggests that managing based on individual site indicators does not provide an adequate picture of campsite impacts (Leung and Marion 1999). Therefore, this evaluation, combined with similar criteria to the above, is what drives the decision to keep, close, or modify a dispersed campsite in an attempt to create sustainable sites across the district.

Scenic resources are measured based on two indicators: the degree of change to the existing landscape character and the ability to meet or exceed Forest Plan Scenic Integrity Levels (SIL) within the project area (USDA-FS 1995). Landscape character includes the existing vegetation, such as hardwood species and native and non-native conifers, as well as the forested plateau topography bisected by small streams and large rivers. Land use, including areas developed for oil and gas, is also a part of the existing landscape character. Forest Plan SILs are the classification system used to define the scenic resource objectives across the ANF in terms of minimally acceptable levels with the intent to achieve the highest integrity possible.

The SIL objectives within the project area are represented by a range of high, moderate, and low concern for scenic integrity with a majority of the project area falling into a moderate SIL. Two sections of high SIL are located within the project area. One section is located along the North Country National Scenic Trail (NST), while the other section is located along the lower parts of FR 145, from approximately Fourmile Run to Tionesta Creek and FR 127 where it traverses NFS lands. Other travel ways with a secondary concern for scenery generally have a moderate to low

SIL. This includes the Allegheny Snowmobile Loop and its two connectors and State Road 3004 (Muzette Road).

Table 18–Existing recreation activities and use patterns in the project area

Recreation Activity	Use Patterns
Developed Recreation	None
Pedestrian Trails	North Country National Scenic Trail (NST) – 12 miles
Motorized Trails	FR 145 – 4 miles, Allegheny Snowmobile Loop (ASL) FR 216 – 1.3 miles, ASL FR 127 – 2 miles, ASL Connector 7
Dispersed Camping	Over four dozen heavily used campsites exist along FR 145 and another 14 exist along the North Country National Scenic Trail between FR 127 and The Branch. All the dispersed campsites are user-created and many have been used for a number of years. Impacts range from a circle of rocks denoting a fire ring to large barren cores (no vegetation), large impact areas (change from native to more resilient non-native vegetation), and high levels of damaged trees, garbage, and human waste. Several are rock fire rings in the middle of the North Country NST tread. Most of the sites are located along stream banks; however, a handful of sites are merely pull-off areas along FR 145 that are big enough to park an RV on. Some sites receive use only at high-use periods, such as hunting or fishing open seasons. Others receive constant use from the first weekend of trout season in April to the close of the deer hunting season in early December. Group size ranges from individuals or couples to 40-plus occupants for impromptu family reunions.
Hunting and Fishing	Hunting occurs throughout the project area and is highest during the first few days of deer season (early December). Parking is sometimes in short supply and hunters park their vehicles along forest roads: FR180 is open to highway legal vehicles from FR180A to the end, and FR145A, FR399, and FR526 are open to high-clearance vehicles, during the hunting seasons (September 25 to January 15). Fishing opportunities occur along Salmon Creek, Little Salmon Creek, and The Branch, as well as some of the larger tributaries. Stocked trout streams are heavily utilized during the first few weeks of trout season.
Unroaded Areas	There is one unroaded area greater than 500 acres: #53-Two Mile Run (610 acres) located in the project area (USDA-FS 2003) (See Map 1).
High Recreation Use Corridors	Two sections of high SIL are within the project area. One section is located along the North Country NST, while the other section is located along the lower parts of FR145, from approximately Fourmile Run to Tionesta Creek, and FR127 where it traverses National Forest System lands.
Unique Features and Special Events	No unique features or special events occur in the area.

Environmental Consequences

IM-7: Effects of proposed activities on the Recreation Opportunity Spectrum (ROS) classification.

Direct, Indirect, and Cumulative Effects

For all alternatives, there would be no direct or indirect effects to the ROS classification from previously approved or proposed activities. However, cumulative effects could occur to ROS through the effects of expanding OGD. The number of new OGD wells and accompanying roads would probably continue to increase in the cumulative effects analysis area. The rate of OGD can vary based on economics, technology and supply and demand. The effects to ROS could include a loss of solitude (due to machinery noise and vehicle traffic), easier access (due to additional roads), and a more modified environment (due to additional roads and well pads), which may result in a decrease in roaded natural ROS classification and an increase in roaded natural – modified and rural ROS classifications within the project area under all alternatives.

IM-8: Effects of proposed activities on Landscape Character and Effects of proposed activities that would cause Scenic Integrity Levels (SILs) to not be met.

Alternative 2 (No Action)

None of the proposed timber harvest or reforestation activities would occur; therefore there would be no additional changes in the current condition of the scenery or in the existing landscape character. Changes may occur in the forest canopy and understory vegetation as a result of natural stand development or disturbance processes. These natural processes may be seen as pockets of dead and dying trees, large openings in the canopy and some stands with high densities that may lack age class diversity.

The density of roads associated with OGD would continue to impact the scenery. However, the capacity to meet or exceed the SILs and to maintain the landscape character at locations within the project area would remain unchanged.

Alternative 1 (Proposed Action)

If Alternative 1 was implemented, the proposed vegetation management has the potential to affect the character of the natural appearing forest vegetation. The greatest potential change to the landscape character is from harvest activities that remove large numbers of trees creating temporary openings of sunlight on the forest floor. Other treatments have less effect on the landscape character. Reforestation treatments, such as herbicide application, site preparation, fencing, prescribed burning, release, planting and fertilizing, improve the stand with long long-term benefits to visual quality.

Design features would be applied to areas of greatest change to scenery to meet the SILs and maintain the landscape character in the project area. These design features are found in two references for managing scenery at the project level: Allegheny National Forest Scenery Management Implementation Guide (USDA-FS 2009c) and the National Forest Landscape Management Volume 2, Chapter 5, Timber. With the application of appropriate design features on pages 18 and 19, effects of harvest treatments as seen from CL1 and CL2 corridors would meet or exceed the Forest Plan SILs (USDA-FS 2007a, pp. 62-64).

Alternative 3

If Alternative 3 was implemented, the effects would be virtually the same as Alternative 1. The

only difference is the loss of stand 631017, a proposed thinning unit, along FR 127.

Cumulative Effects

This project proposal is located in the west central portion of the Marienville Ranger District containing the Salmon, Little Salmon, and The Branch watersheds. The scenery cumulative effects analysis area encompasses 13,851 acres of NFS lands and 1,239 acres of private land. This area captures the extent of the viewshed corridor when traveling the major and secondary travel ways in the project area and is useful to capture the cumulative effects that impact scenery.

The time period considered for the cumulative effects analysis is from 10 years prior to this project proposal to 20 years into the future. It covers the effects of past activities and the effects of the approved projects yet to be completed as well as proposed activities, and those in the reasonably foreseeable future. It provides for an overall view of the impact of vegetation management and OGD activities in combination with past, current and future project proposals. It is difficult to predict exactly where or what activities would occur in the future, but it is important to remember that future federal activities would be subject to the National Environmental Policy Act process to ensure that scenic quality is protected. The desired condition outlined in the Forest Plan would guide choices and protect the land from cumulative effects as projects are proposed in the future. The standard practice on the ANF is to meet or exceed SILs by design, modification, or mitigation. Monitoring of the scenic resource is conducted every 5 years to ensure practices meet Forest Plan standards and guidelines. Past monitoring has demonstrated a 99 percent success rate in meeting or exceeding scenery standards (USDA-FS 1998, p. 60); this is expected to continue into the future. Periodic timber harvest using a variety of techniques, combined with natural disturbance, have the potential to provide diversity in forest views by providing gaps in forest cover and variation in vegetative height, providing more vertical structure within the forest than currently exists.

The number of OGD wells and accompanying roads will probably continue to increase in the cumulative effects analysis area. The rate of OGD can vary based on economics, technology and supply and demand. The effects of expanding OGD on scenery would be most evident along CL1 and CL2 travel ways. Areas with greatest impacts may require rehabilitation if OGD activities fail to meet the specified SILs.

In summary, the cumulative effects resulting from past, proposed and reasonably foreseeable future Forest Service management activities would maintain the existing landscape character type and would meet or exceed the established SILs of the cumulative effects analysis area. No detrimental effects to scenery resources are anticipated as a result of implementing any of the alternatives.

IM-9: Effects of proposed activities on recreation activities or use patterns.

Direct, Indirect, and Cumulative Effects

The main attraction for any dispersed campsite is water. Of the nearly 70 dispersed campsites located along FR145 and FR127, only 15 are not immediately adjacent to water. Only three require a walk of more than a few hundred yards. However, riparian areas tend to be the most sensitive areas on the ANF. They often have populations of rare plants, wetlands, or other sensitive soil areas and are most likely to be changed by the actions of weather, water, and more than anything else, people. Two Student Conservation Association interns were trained to evaluate campsites in the summer of 2010; Salmon Creek was one of the areas where they located campsites with a GPS and measured site indicators. Their evaluation showed sites that ranged from extremely low to extremely high use/impact, sites with a parking availability of none (meaning that parking was communal and often a path through or near one site led to another

nearby site) or for up to four vehicles, and sites with a variety of resource concerns. Further examination by district recreation and archeology staff discovered four missed sites and brought more information into the keep/close/modify discussion. Sites were proposed for closure for the following reasons:

- No adequate off-road parking and no space to create any
- Location on OGD sites (roads or well pads)
- Resource concerns – impacts to sensitive wildlife species (fish and aquatic invertebrates), archaeological sites, or soil and water concerns such as steep banks or crossing perennial or intermittent water channels
- Ease of rehabilitation – use appears low and impacts small, indicating little real need for the site.

For Alternative 2, there would be few direct effects to existing recreation activities or their use patterns in the project area. All campsites would remain open. Desirable sites would continue to be used and would likely continue to expand as visitors cut saplings and small trees for firewood, vegetation loss from trampling continues, and campers set up under the trees to avoid muddy areas. Less desirable sites may or may not change in size or condition depending on intensity of use. Hunting, fishing, driving for pleasure, and snowmobiling would be unlikely to change. Indirect effects to recreation activities and their use patterns may occur in the long-term through untreated understory vegetation. Stands with dense interfering vegetation may create less than ideal conditions for hunting. Areas with wind damaged trees, debris, or downed trees may hinder hunting, wildlife viewing, and camping activities.

For Alternatives 1 and 3, direct and indirect effects to recreation activities and their use patterns could include a temporary disruption to snowmobile trail use, hunting, dispersed camping, and other recreational activities as a result of increased vehicle traffic (associated with timber harvesting) on roads at or near treatment units. Particularly affected would be use of FR127, FR145, and FR216 as these roads would be used for timber hauling and, if harvest occurs during the winter snowmobiling season – generally from November to April, by snowmobiles. Hikers on the North Country NST could be turned back when units along the trail are being harvested if this is considered necessary to ensure their safety. Harvested units would provide visual diversity along the trail from mature forest to young, regenerating forest. Forest Plan standards and guidelines for feathering edges and leaving reserve trees would assist in the visual transition for final harvests. Sections of trail within the harvested units would need increased maintenance for several years as seedlings, brush, and herbaceous species respond to the increased sunlight on the forest floor. These effects are considered temporary in nature although they could persist up to several decades as trees grow and mature. Young forests also provide forage for many game species desired by hunters.

New camping sites or day use parking could be provided by the construction of log landings, as these sites are often favored by RV users after the sale is closed if the site is located near enough to water for the convenience of campers or if the site provides a viewpoint. The advantages of such sites is that they are large enough to pull in an RV or vehicle-trailer combination, they are level, and they are hardened so that vehicles do not sink during the camping stay even in inclement weather. Grading, delineating, and surfacing some parking areas would make them easier to access for camping purposes while protecting soil and water values on or near the campsites. Closing unsustainable sites with steep banks or other resource concerns protects sensitive species and habitats, prevents erosion and siltation into streams, and protects historic sites and artifacts from casual damage. Closing sites would result in displacement of campers

during high use weekends, although it is fully expected that they would move to another area which serves their needs. On average weekends, little to no displacement would occur since many of the proposed closed sites go unoccupied due to unfavorable site conditions. Installation of a SST toilet near the intersection of FR127 and FR145 would help alleviate some of the human waste problems associated with clustered intensive use areas; however, it will not solve it entirely. Minimum impact techniques would still be necessary for all facets of the dispersed camping experience.

Under Alternative 2, the size and shape of the unroaded area would not change from the existing condition (see Map 1). Under Alternatives 1 and 3, the size and shape of the unroaded area would increase by approximately 86 acres to 696 acres due to proposed road decommissioning (see Maps 3 and 8). However, potential future OGD may change the size and shape of this unroaded area in all alternatives.

The introduction of large woody debris into streams in Alternatives 1 and 3 may increase quality habitat and fishing opportunities. Design features will be applied to areas of greatest impact to recreation to mitigate effects to recreational activities in the project area.

For all alternatives, cumulative effects could occur through the effects of expanding OGD. Effects to recreation activities and their use patterns could include a loss of solitude (due to machinery noise and vehicle traffic), easier access (due to additional roads), and a more modified environment (due to additional roads and well pads), which are conditions to be expected in areas with a roaded natural or roaded natural modified ROS classification. Recreationists who are interested in fixed areas, such as a favorite campsite or fishing hole or those who follow a defined trail, would see changed conditions along their route or may be displaced temporarily or permanently from that site or route, depending on level of development and personal preference.

Economics

Analysis Framework

Jobs and income in Elk, Forest, McKean, and Warren counties are affected by activities on the ANF through direct employment, as well as, products and services that are generated from activities on NFS lands. Priced commodities from the project are generated through timber products and the receipts from timber sales. Twenty-five (25) percent of the actual revenues generated by timber sales on the ANF are returned to Elk, McKean, and Warren Counties for support of roads and schools, while Forest County receives direct payments from Congress through the Secure Rural Schools Act. Remaining timber receipts are returned to the U.S. Treasury. The main non-priced services include dispersed recreation opportunities such as hunting, fishing, hiking, and viewing scenery and wildlife.

Environmental Consequences

IM-10: Effects of proposed activities on providing goods and services.

Direct and Indirect Effects

For Alternative 2, none of the proposed activities would be implemented. Therefore, there would be no additional monetary implementation costs other than the normal custodial and stewardship costs associated with managing NFS lands. There also would be no additional monetary returns to Forest County for schools and roads or additional returns to the U.S. Treasury. Additional wood products would not be provided and additional jobs would not occur.

For Alternatives 1 and 3, proposed timber harvests (approximately 31,800 MBF under Alternative 1 and 25,300 MBF under Alternative 3) would provide an economic benefit in the form of forest products to local industries, income and jobs for local purchasers and contractors, and to the U.S. Treasury. In considering the effects on recreation activities within the project area, proposed management activities could negatively affect some forest users in the short-term. However, beneficial impacts to recreation activities could potentially result from the proposed activities, which would enhance wildlife habitat supporting hunting, wildlife viewing, and berry picking. As shown in Table 19, total costs include jobs related to the timber sale layout, timber marking, contract administration, and reforestation treatments prescribed. Reforestation treatments include a variety of treatments that would be implemented in order to establish adequate seedling and saplings prior to and following timber harvests. Reforestation treatments are typically accomplished by local workers though service contracts, benefitting local communities. The bulk of the costs associated with these treatments include site preparation, herbicide application, fertilization, release, and fencing. The costs and returns in Table 19 do not include approved activities that have not been implemented yet from past projects.

The percentage of minority populations of the four ANF counties is: Warren 1.7 percent, McKean 4.4 percent, Elk 1.3 percent, and Forest 16.6 percent. The county minority populations average less than the Commonwealth of Pennsylvania overall, which is 17.1 percent. The percentage of low-income population for the four counties is: Warren 19.8 percent, McKean 23.9 percent, Elk 18.3 percent, and Forest 19.6 percent. These percentages average 20.8 percent, which is almost the same as the total Commonwealth of Pennsylvania, which is 20.9 percent (US Census 2012). Statistics for low income and minority populations for the ANF counties do not exceed requirements for additional environmental justice review (USDA-FS 2007b, pp. 3-399–3-443).

Table 19–Cost and returns from Alternatives 1, 2 and 3

Treatment Costs and Returns	Alternative 1 (Proposed Action)	Alternative 2 (No Action)	Alternative 3 (No New Roads)
Total Costs Planning, timber sale preparation and administration, reforestation costs, road work, wildlife habitat improvements, and project planning and implementation	$7,360,428	$828,000[a]	$6,416,592
Total Returns Revenues generated from timber harvest on NFS land	$6,079,524	$0	$4,836,854
Net Cash Flow Total Return - Total Cost	(-) $1,280,904	(-) $828,000	(-) $1,579,738

[a] *Only includes planning and road maintenance (for open Forest Service Roads) costs.*

Cumulative Effects

For Alternative 2, previously approved activities, private land harvesting activities, and future management activities would contribute to the local economy as jobs are created within the industry and material is transported and processed in local mills. Cumulatively, there would be fewer timber related jobs, wood products, and monetary returns to Forest County for schools and roads and returns to the U.S. treasury than in Alternatives 1 and 3.

Future timber sales could generate more or less revenue than estimated depending on positive or negative changes to the value of timber during the implementation of the project. Management activities proposed in Alternatives 1 would be expected to provide additional beneficial effects for contractors, primary and secondary wood processors, and those who harvest, haul, and process wood products. The estimated revenue in Table 19 is based upon the 5-year average (2008–2012) awarded value across the ANF.

Economics were analyzed in the Forest Plan FEIS (USDA-FS 2007b, Appendix B, pp. B-78–B-98). On a proportional basis (according to land area), the cumulative effects on the local economy from proposed management activities in Alternative 1 is the same as the selected Alternative Cm in the Forest Plan FEIS (USDA FS 2007b) and ROD (USDA-FS-2007a).

The Forest Plan FEIS contains a history of the economic and demographic conditions within the four-county area (USDA-FS 2007b, pp. 3-399–3-410). Primary Forest Service related contributions from projects are related to forestry, logging, recreation, and manufacturing. OGD and support services also make large contributions to local economies. Additional details can be found in the cumulative effects discussion for the Forest Plan FEIS (USDA-FS 2007b, pp. 3-412–3-413) and Programmatic Effects of Private Oil and Gas Activity on the Allegheny National Forest (USDA-FS 2010a, unpublished).

Human Health and Safety

Analysis Framework

Herbicides such as glyphosate or sulfometuron methyl are used to control interfering plants on the ANF. Human risks are discussed in the Forest Plan FEIS and Appendix G of the Forest Plan FEIS (USDA-FS 2007b). Broadcast treatments are generally completed a substantial distance away from private residences and their water sources. Herbicides would be applied following Forest Plan standards and guidelines to minimize the risk of accidental exposure. This would include posting warning signs, maximum wind caps (10 mph), directional spraying (near property lines and trails), landowner notification, timing, and buffers to minimize accidental contact. Further information regarding herbicide use for seedling establishment and its safety may be found in the Forest Plan (USDA-FS 2007a, pp. 54–59; p. A-33–A-38), the Forest Plan FEIS (USDA-FS 2007b, pp. 3-119–3-122), and Appendix G of the Forest Plan FEIS (USDA-FS 2007b).

Prescribed burning can pose a hazard to forest users and those driving through the project area. Wind shifts may cause smoke to temporarily impair visibility for humans. Smoke related health issues may arise. Multiple safety and control measures would be incorporated into each prescribed burn plan. Further information regarding prescribed fire may be found in the Forest Plan (USDA-FS 2007a, pp. 70, A-32) and the Forest Plan FEIS (USDA-FS 2007b, p. 3-125).

OGD activities within the project area include drilling, hydro-fracing, well construction, access road use, electric lines, pipelines that are either buried or above ground, pump jacks, collection tanks, and other miscellaneous equipment. People working at or traveling around OGD sites and the associated equipment are exposed to related hazards.

Environmental Consequences

IM-11: Risks to human health and safety from proposed activities.

Direct, Indirect, and Cumulative Effects

Potential effects to public health and safety from the previously approved and proposed treatments include the use of herbicides (Alternatives 1, 2, and 3) and smoke emissions from prescribed burning (Alternatives 1 and 3).

For all alternatives, overall risks from the planned (up to 1,942 acres) and previously approved (44 acres) use of glyphosate and sulfometuron methyl are expected to be low (USDA-FS 2007a, p. ROD-23). Forest Plan standards and guidelines for pesticide application (includes herbicides) would be implemented (USDA-FS 2007a, pp. 54–59) and are based on the human health risk assessment (USDA-FS 2007b, Appendix G) completed for the Forest Plan FEIS (USDA-FS 2007b). Appendix A of the Forest Plan (USDA-FS 2007a, pp. A43-A45) also contains additional information on site selection, herbicide selection, and application methods and rates. With the implementation of Forest Plan standards and guidelines and past monitoring, proposed herbicide treatments are anticipated to have negligible effects to public health or safety (USDA-FS 2008, pp. 28–33).

Smoke emissions from prescribed burning in Alternatives 1 and 3 to maintain oak types would be of short duration. Smoke management through dispersion would be addressed in the burning parameters of prescribed burn plans. Emissions from prescribed burning are not anticipated to exceed federal air quality standards. The Forest Service (ANF) will develop safeguards in burn plans to ensure the protection of human life, surrounding private lands or structures, other fire sensitive forest communities, and local resources present on the sites.

All alternatives would avoid adverse impacts to public health and safety through implementation of Forest Plan standards and guidelines, Pennsylvania BMPs, project design features, timber sale contract requirements, Office of Safety and Health Administration (OSHA) requirements, and standard operating safety procedures (including OGD operations). Actions, such as dust abatement, signing of roads, identifying the area as an active timber sale area, safely securing truck loads, and maintaining the timber haul routes, are standard precautionary measures that would be employed.

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