

Millsteck

Environmental Assessment



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Department of
Agriculture

Forest
Service

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**Marienville Ranger District
Allegheny National Forest**

**Warrants 2547, 3550, 3551, 3564, 3643, 3670, 4130, 4133, and
4136, Jenks Township**

Warrants 3144, 3145, 3147, 3158, and 5700, Barnett Township

Forest County, Pennsylvania

Warrants 2792, 4042, and 4556, Spring Creek Township

**Warrants 2362, 2517, 2518, 2523, 2524, 2532, 2533, 2542, 2543,
2545, 2546, 2548, 2565, 2581, 2596, 2639, 2667, 2790, 2792, 4042,
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EXECUTIVE SUMMARY

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

- Creation of 1,736 acres of early structural habitat using even-aged management.
- Uneven-aged management would be practiced on 176 acres to increase within stand structure.
- Intermediate thinning on 297 acres to promote stand growth, tree vigor, and species diversity.
- Reforestation activities listed in Table 1, on page 10, to maintain and improve forest health through the promotion of stand growth, tree vigor, and species diversity.
- Wildlife habitat improvements on 160 acres, including installing 32 wildlife structures and enhancing 30 acres of herbaceous openings.
- Felling trees along 4.7 miles of streams (up to 35 trees per mile) to introduce large wood into streams to improve aquatic habitat, trap sediment, and slow flood flows.
- Treatment of 70 acres of non-native invasive plant species along road corridors and within stands using manual, mechanical, and chemical methods.
- Improve 11 dispersed camping sites, while closing and rehabilitating 6 dispersed camping sites to minimize impacts to soil and water resources.
- Construct 0.7 miles of road utilizing new corridors and 4.8 miles of road utilizing existing corridors to provide access for proposed and future management activities. Relocate the gate on FR 402 to the beginning of the road and construct a parking area in front of the gate. Place high-quality durable material (surface armoring) on 9.2 miles of new or existing road or trail stream crossings to minimize soil erosion and sedimentation.
- Harvest of 31.8 million board feet of timber from approximately 3,354 acres of National Forest System lands in three entries.

The project area contains 26,251 acres, of which 19,135 acres are on National Forest System lands located in Management Areas 2.2, 3.0, 6.1, and 7.1. The proposed action would be implemented under the 2007 Allegheny National Forest 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 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, providing access for vegetation management, treating non-native invasive plant species, and improving wildlife habitat.

A no action alternative (Alternative 2) and another action alternative (Alternative 3) were also 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 page 18. The alternatives are described in Section II—Alternatives and the effects for each alternative are included in Section III—Environmental Consequences. Both action alternatives will meet the purpose and need and are consistent with the Forest Plan.

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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 Millsteck 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 (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 Millsteck Project Area

The proposed 26,251-acre Millsteck project area is located in the south central portion of the Marienville Ranger District, southeast of Marienville, Pennsylvania. It includes National Forest System (NFS) and private lands within Warrants 2547, 3550, 3551, 3564, 3643, 3670, 4130, 4133, 4136 in Jenks Township and Warrants 3144, 3145, 3147, 3158, and 5700 in Barnett Township, Forest County and Warrants 2792, 4042, and 4556 in Spring Creek Township and Warrants 2362, 2517, 2518, 2523, 2524, 2532, 2533, 2542, 2543, 2545, 2546, 2548, 2565, 2581, 2596, 2639, 2667, 2790, 2792, 4042, 4129, 4134, 4135, North Strong, Raught and Wilson, E.

Heath, Nelson Strong, J. Wyncoop and E. Wyncoop in Millstone Township, Elk 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. Most of the NFS lands within the project area lie within Management Area (MA) 2.2 – Late Structural Linkages (11,320 acres). There are 6,770 acres located in MA 3.0 – Even-aged Management, 925 acres in MA 6.1 – Late Structural Habitat, 120 acres in MA 7.1 – Developed Recreation Areas, and 7,116 acres of non-Forest Service lands within the project area. See Section III– Environmental Consequences for a description of the existing condition.

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 Millsteck project is a project-level analysis. The scope of the Millsteck 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 Apple Tree Maintenance Categorical Exclusion (2009), FY07 Regeneration EA (2009), FY06 Regeneration EA (2006), Spring Creek FEIS (2004), Painter Run Windthrow Salvage EA (2003), and Vegetation Management on Electric Utility Rights-of-Way FEIS and ROD (1997). These FEISs, EAs, and categorical exclusions have approved activities within the Millsteck project area that have not been fully implemented 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, including 192 trees in the Millsteck project area. Implementation of this project is ongoing across the district as funding permits.

FY07 Regeneration EA (USDA-FS 2009b). The FY07 Regeneration project, approved in March 2009, was developed to improve the spatial arrangement of age classes in MAs 2.2 and 3.0 and to complete regeneration sequences in stands with previously initiated regeneration treatments or were severely damaged by the July 2003 storm. Remaining treatments for stands 705026, 705029, 706041, and 706042, (originally salvaged under the Painter Run EA), include herbicide application, fencing or tree shelters, planting, and release, which have not been completed yet. Together the four stands total 13 acres and are located in the Millsteck project area.

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. Remaining treatments for stand 668006 (15 acres) include single tree selection, herbicide application, fencing or tree shelters, planting, and release and for stand 678011 (36 acres) include release. Both stands are located in the Millsteck project area. 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.

Spring Creek EIS (USDA-FS 2004). The Spring Creek project, approved in June 2004, has approved the road decommissioning of 0.24 miles of NS26786, 0.26 miles of NS26785, and 0.08 miles of NS26516 for a total of 0.58 miles of road within the Millsteck project area that has not yet been completed. Within this EIS, the stone pit on FR 228D was approved for expansion by 0.5 acres; this work has not been completed yet. A consistency review was completed for the Spring Creek FEIS in 2008 to ensure that these remaining activities are consistent with the direction in the revised 2007 Forest Plan and is incorporated by reference.

Painter Run Windthrow Salvage EA (USDA-FS 2003a). All proposed activities that are going to be done for this EA have been completed. Four stands, 705026, 705029, 706041, and 706042 from this project are within the Millsteck project area and needed additional reforestation treatments not approved in the Painter Run Windthrow EA. These reforestation treatments were approved in the FY07 Regeneration EA.

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), a substation, and a radio tower site 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 0.6 miles of electric utility line ROW are located within the project area or along the project boundary.

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 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. There is a need 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 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 a stone pit 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).
- There is a need to restore and enhance stream processes and aquatic habitat diversity for brook trout and other headwater stream fishes. Headwater streams on the ANF should have between 75 to 380 pieces of large wood per mile of stream (USDA-FS 2007a, p. 14). Stream area habitat should be comprised of 35 to 65 percent pool and slow-water habitats, which is important for aquatic organism survival and propagation (USDA-FS 2007a, p. 11). Many streams on the ANF and within this project area are lacking large wood due to extensive timber harvesting that occurred along these streams 80 to 115 years ago. Physical habitat surveys have been conducted in the Millsteck project area. Stream habitat is lacking large wood and in-stream cover. Since large wood is important for creating larger, deeper pools, the low numbers of large wood is likely contributing to the low numbers of quality pools observed. Large wood in streams is also important for the purpose of connecting aquatic habitats, promoting stream stability and sediment and organic matter storage (Dolloff and Webster 2000).
- Specific to MA 2.2 – There is a need to contribute 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 or regenerate 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. 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).

There are no treatments proposed in Management Areas 6.1 and 7.1.

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 3,354 acres, about 17.5 percent of NFS lands within the project area.

It is assumed that the unfinished activities approved in prior decisions would proceed as planned. This includes single tree selection (15 acres), planting (28 acres), fencing or tree shelter installation (28 acres), herbicide application (28 acres), and release for species diversity (64 acres).

Proposed **vegetation management activities** include:

- Even-aged regeneration methods for Allegheny and upland hardwood forest types including shelterwood seed and removal cuts and delayed shelterwood seed and removal cuts are proposed on 1,154 acres (6.0 percent of NFS lands within the project area). Even-aged management regeneration treatments for conifer forest types, including shelterwood seed cuts and removal cuts are proposed on 182 acres (1.0 percent of NFS lands within the project area). Even-aged management regeneration treatments for oak forest types, including preparatory cut on 1,545 acres (8.1 percent of NFS lands within the project area), followed by shelterwood seed cuts on 773 acres (3.8 percent of NFS lands within the project area), and then followed by shelterwood removal cuts on 400 acres (2.1 percent of NFS lands with the project area), are being proposed. These treatments would be accompanied by reforestation activities, including site preparation, herbicide application, planting, fencing and installing individual tree shelters, and release to provide and maintain age class and species diversity. Prescribed burning (on up to 1795 acres) and possibly scarification would also be used in the oak and pine forest types.
 - Preparatory cuts enhance stand conditions for seed production by greatly reducing shade from the middle and lower canopy layers.
 - Shelterwood seed cuts remove up to half of the forest canopy to increase sunlight to the forest floor. The trees left produce seed, which develop into the next age class in a moderated microenvironment.
 - Shelterwood removal cuts remove remaining overstory once desirable tree seedlings are established except for reserve trees.
 - Delayed shelterwood cuts are similar to shelterwood cuts excepted the first cut does not take place until stands surrounding the delayed harvest stands have reached 15 feet tall and has been certified as stocked with desirable hardwood saplings compared to neighboring stands tree height, which might take 5 or more years.
- Uneven-aged regeneration methods including group selections and intermediate thinning are proposed on 176 acres (0.9 percent of the project area on NFS lands). The group selection treatments would be accompanied by reforestation activities, including site preparation, herbicide application, planting, fencing and installing individual tree shelters, and release to provide and maintain age class and desirable species diversity.

- 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 89 stands (3,016 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 20 percent of those stands for which it was originally proposed. Herbicide application is proposed for 3,115 acres to reduce dense interfering vegetation for natural regeneration and to enhance desirable 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 297 acres (1.6 percent of NFS lands in the project area), to promote stand health, growth, vigor, and diversity. Two stands (668013 and 668014) 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 3,395 acres to increase or maintain desirable 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.

Changes in the vegetation management proposal from the scoping package

Stand 677017 was listed as 28 acres in scoping. This stand was dropped due to resource concerns (private water source development on NFS lands). The following treatments were reduced by 28 acres: shelterwood seed cut/shelterwood removal, herbicide, fencing, site preparation, and release.

Stand 677030 was listed as 34 acres in scoping. This stand was also dropped due to resource concerns (private water source development on NFS lands). The following treatments were reduced by 34 acres: shelterwood seed cut/shelterwood removal, herbicide, fencing, site preparation, and release.

Stand 677031 was listed as 36 acres in scoping. A portion of this stand was also dropped due to resource concerns (private water source development on NFS lands). The following treatments were reduced by 24 acres: shelterwood seed cut/shelterwood removal, herbicide, fencing, site preparation, and release. The remaining 12 acres that were not dropped were made into a new stand (677041) and proposed in the project.

Stand 677041 was not listed during scoping. This 12 acre stand was broken out of stand 677031 from the acres that were not dropped. The following treatments were increased by 12 acres: shelterwood seed cut/shelterwood removal, herbicide, fencing, site preparation, and release.

Stand 678018 was listed as 25 acres in scoping. During field review, this stand was reduced to 20 acres. The following treatments were reduced by 5 acres: shelterwood seed cut/shelterwood removal, herbicide, fencing, site preparation, and release.

Stand 692001 was listed as 23 acres in scoping. During field review, this stand was reduced to 20 acres and the prescription was changed from shelterwood seed cut/shelterwood removal to single tree selection/group selection. The following treatments were also reduced by 3 acres: herbicide, fencing, site preparation, and release.

Stand 692004 was listed as 23 acres in scoping. During field review, this stand boundary was readjusted and this increased the stand to 24 acres. The following treatment was increased by 1 acre: crop tree release.

Stand 692034 was listed as 10 acres in scoping. During field review, this stand boundary was readjusted and this increased the stand to 12 acres. The following treatment was increased by 2 acres: crop tree release.

Stand 694011 was listed as 30 acres in scoping. During field review, this stand was increased to 38 acres. The following treatments were increased by 8 acres: shelterwood seed cut/shelterwood removal, herbicide, fencing, site preparation, and release.

Stand 695023 was listed as 39 acres in scoping. During field review, the treatment for this stand, intermediate thinning, was reduced by 4 acres.

Stand 670035 was listed as 6 acres in scoping. During field review, the stand was dropped from the proposed action because the temporary opening created with stands 31 and 32 would be greater than 40 acres.

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 27 acres. Fencing or tree shelter installation is being proposed for 16 acres to protect planted or existing trees and shrubs.
- Installing 32 wildlife structures to provide nesting and roosting opportunities for cavity dwellers and other wildlife.
- Restoring or rehabilitating (liming, disking, applying fertilizer, seeding, and mulching) existing herbaceous openings (30 acres) to enhance wildlife habitat.
- Aspen is a minor component within all parts of the project existing as small inclusions within other forest types. Many aspen clones are becoming decadent and will be lost if not regenerated within the decade. Regeneration of aspen on 87 acres would enhance wildlife habitat and maintain aspen in the project area.
- Felling approximately 35 trees (large wood introductions) per mile into streams and onto floodplains along 4.7 miles of streams within the project area would 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 be felled only where large woody debris is lacking and trees are available to be felled without reducing stream side shading (see Map 4).

To reduce NNIP species within the project area, the following **treatments** are being proposed (see Map 5 for specific treatment areas):

- Twenty two (22) NNIP species have been documented along roads and within stands and stone pits in the project area. Proposed treatment over the next 10 years includes a combination of manual/mechanical treatment (hand pulling, clipping, digging, mowing for example) and/or herbicide application of glyphosate and/or sulfometuron methyl. As NNIP infestations change over time, prior to NNIP treatment appropriate methods will be determined based on site conditions, area of infestation and species. During implementation not all species and/or infestations may be selected for treatment, depends on prioritization based on species extent and its ecological impacts. Not all NNIP species or infestations within the project area may be treated. For example, coltsfoot, which is commonly found along road corridors and in other disturbed areas, would not be treated unless it is invading a Regional Forester Sensitive Plant Species' habitat (see Forest Plan, Appendix A, pp. A-43–A-44 for additional discussion on site selection and treatment priority). Additional NNIP species or infestations may be documented during implementation; additional NNIP species treatments of these species or infestations would follow appropriate Forest Plan direction. Approximately (70 acres) of NNIP treatment is proposed over the next 10 years within the project area. This is based on the amount of NNIP currently found, the amount of the project area surveyed, an estimate of the amount of NNIP for areas not surveyed and an increase of 1 percent per year of NNIP infestation over the next 10 years.

To minimize impacts to soil and water resources within the project area, the following **recreational improvements** are being proposed (See Map 3):

- There is a need to define parking areas on eight dispersed camping sites along FR 131 within the project area. Closing and rehabilitating six dispersed camping sites along FR 131 is proposed because their use is causing soil and water concerns. Culvert installation

is proposed for seven sites along FR 131. Stream bank stabilization is proposed for one dispersed camping site along FR 131.

To improve access within the project area for proposed and future vegetation management, the following **transportation activities** are being proposed (see Map 3):

- To facilitate access to stands proposed for treatment and provide for a safe and adequate public transportation system while protecting resources, 5.5 miles of road construction are needed with 4.8 miles using existing corridors and the 0.7 miles using new corridors. No road decommissioning is being proposed.
- To alleviate parking congestion near the gate on FR402 and to protect soil and water resources, moving the gate to the beginning of FR402 is being proposed along with constructing a parking area in front of the new gate for hunting and other recreational activities. The 0.2 miles of the road that is currently managed as an open road is being proposed to be managed as a closed road. No other road management changes are being proposed with this project.
- Where proposed or existing permanent roads are within 300 feet of perennial and intermittent streams, surface armoring would be used at the crossings to control sediment delivery. This project has 9.2 miles of armoring proposed.
- Stone will be needed for road maintenance (spot surfacing) and construction of Forest Service system roads. To provide this stone, horizontal and vertical expansion, on approximately 4 acres, is proposed for one existing stone pit within the project area. Following expansion, this pit will be rehabilitated and stabilized, until needed again.

Changes in the transportation proposal from the scoping package

Table 1 in the scoping package listed FR131F as a new corridor. This proposed road has been dropped at this time because after further field review, FR774B was determined to be a better location to access proposed vegetation treatment stands in this area.

The new FR776 corridor proposed in scoping has been dropped.

The new FR780 corridor proposed in scoping has been dropped due to resource concerns.

Table 1 in the scoping package proposed six stone pits for expansion. After conducting field reviews and completing testing on these pits, FR228A pit was dropped do to resource concerns, and FR228D, FR383B, FR404, FR592, and FR780 stone pits were dropped do to a lack of sufficient stone.

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 (non-commercial)	124
Intermediate thinning (commercial)	173
Shelterwood seed cut (1 st entry)/shelterwood removal (2 nd entry)	698
Delayed shelterwood seed cut (2 nd entry)/shelterwood removal (3 rd entry) for non-oak management	456
Preparation cut (1 st entry)/shelterwood seed cut (2 nd entry)/shelterwood removal (3 rd 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)	1545/773/400
Shelterwood seed cut (1 st entry)/shelterwood removal (2 nd entry) for red pine management (temporary openings will be less than 20 acres in MA 2.2 or less than 40 acres in MA 3.0)	182
Uneven-aged Treatments	
Intermediate thinning – Accelerate mature forest condition (AMFC)	50
Single tree selection/group selection – Restore understory mature forest condition (RUMFC)	126
Understory Vegetation Treatments (acres)	
Herbicide – reforestation	3115
Prescribed Burning and scarification	1795
Fence construction and/or tree shelter installation (optional)	3016
Site preparation	3090
Tree planting for species diversity	579
Release for species diversity	3395
Non-native invasive plant species treatments (manual, mechanical, and herbicide)	70
Wildlife Management (acres)	
Planting	27
Install wildlife structures (number)	32
Opening enhancement	30
Aspen regeneration	87
Brush pile creation (number)	20
Fencing and tree shelter installation (optional)	16
Watershed Management (miles)	
Large wood introductions (in streams)	4.7
Recreational Improvements	
Surface armoring of road stream crossings (miles)	9.2
Improve dispersed camping sites (number)	11
Close dispersed camping sites (number)	6
Travel Management (acres)	
Road construction (new corridor)	0.7
Road construction (existing corridor)	4.8
Area cleared in existing stone pits (number of pits/acres)	1/4
Road management change from open to closed on FR402	0.2

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 September 2012. 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 January 25, 2011, a scoping proposal explaining the purpose and need for action, as well as the locations and types of proposed activities, was mailed to 907 individuals, adjacent land owners, and organizations, including those who have expressed a desire to be notified about current projects, subsurface mineral owners, and adjacent landowners. On February 16, 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 seven (47) responses to scoping were received before the end of the scoping period. Forty-two (42) of the respondents submitted the same or similar comments (by email [form letter]). Three (3) 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 summarizes the results.

Scoping comment issues were separated into two groups: unresolved and resolved issues. 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.

Two unresolved issues were identified from the comments received during scoping.

1. Keep Steck Run (1807 acres), Gurgling Run (1144 acres), Muddy Fork (875 acres), Gregg Hill (864 acres), and WB Millstone (601 acres) as unroaded areas for dispersed recreation and as large relatively undisturbed blocks of habitat. Drop timber harvesting and road construction in these unroaded areas.
2. Stay out of the Painter Run area. Activities, including timber harvesting, road activities on FR383B and FR383C, a new stone pit on FR383B, and a new road corridor (FR382), in the Church Run, Lappin Run, and above Clyde Run effectively end any real chance that this block of forest above the Clarion River will retain the relatively wild qualities that it currently possesses.

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 Millsteck 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 unresolved issues 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 (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 end the use of even-aged management in the project area. 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. One third of the NFS lands (35.4 percent) within the project area are located in MA 3.0 – Even-aged Management. This decision has been made at a higher level (Forest Plan).

An alternative in which all treatments in Management Area 2.2 are dropped. This alternative was considered but eliminated from detail study because it would not meet the purpose and need for the project, which includes 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. This decision has been made at a higher level (Forest Plan).

An alternative where areas that are not predicted for full field development are retained as havens and receive a special level of triage-protection. This alternative was considered but eliminated from detail 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, regenerating and improving oak stands, and restoring and maintaining forest health throughout the project area. Since only about 10 percent (or approximately 1,990 acres) of the project area is expected to have “full field development”, an alternative where areas that are not predicted for full field development are retained as “havens” would resemble the no action alternative.

An alternative to offset the impacts of oil and gas development (OGD). 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 includes improving the spatial arrangement of age classes in MA 3.0, restoring and maintaining forest health throughout the project area, and regenerating and improving oak stands. All Forest Service (ANF) proposals will follow Forest Plan standards and guidelines (USDA-FS 2007a). This direction meets or exceeds Pennsylvania BMPs. When future projects are proposed,

project analysis and design will consider the combined impacts from OGD and other proposed ANF management activities.

Compared to other areas of the ANF, the Millsteck project area has experienced very little OGD in recent past. There are currently 116 wells within the project area, which equates to 1 well every 226 acres compared to the ANF average of 1 well every 53 acres. 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, have been analyzed along with Forest Service proposals. The no action alternative is responsive to this concern. Also, in some regards the proposed actions in Alternative 1 and 3 “offset” the effects of OGD by enhancing water quality with road maintenance, surface armoring, dispersed campsite closure, rehabilitation, and hardening, and aquatic habitat improvements.

An alternative that decommissions 1.1 miles of FR592 to create a larger unroaded area (combining Lick Run and Muddy Fork unroaded areas). This alternative was considered but eliminated from detailed study because it has already been decided by the Forest Plan or higher level decision. FR592 is currently used to access three active private gas wells. Mineral estate owners have the right to access their minerals. Except for Warrant 2543, all of the subsurface minerals in the project area are privately owned. FR592 is located in MA 3.0 – Even-aged Management. The Forest-wide RAP (2003) identified forest road (FR) 592 as a road needed for vegetative management now and in the future. The Lick Run unroaded area has been reduced in size from 1098 acres to 667 acres by road construction (FR157C and extension of FR591) proposed in the Brush Creek project (USDA-FS 2007c).

The ID team considered using FR378 to access these gas wells. However, this would require constructing approximately 0.14 miles (740 feet) of road using new corridor, with a vertical rise of 60 feet or an 8 percent slope, from FR378 to FR592. Approximately 1.7 miles (8,990 feet) of FR378 would also have to be reconstructed for timber haul, of which approximately 0.83 miles (4,372 feet) crosses wet soils (group 3). FR378 is currently a grassed road that is used by hikers and bicyclists and crosses MAs 6.1 – Late Structural Habitat and 6.3 – Buzzard Swamp Wildlife Management Area. In MA 6.3, “Roads are generally very limited within this management area to those that support recreation or wildlife enhancement projects. In MA 6.1, “Roads are generally very limited within this management area and most local roads are closed or restricted to public use.” Using FR378 would result in more commercial traffic (timber hauling and oil and gas activities) on FR157, the primary access route for the Buzzard Swamp Wildlife Management Area. Use of FR378 would allow for the decommissioning of approximately 1.1 miles of FR592; however, approximately 0.8 miles of FR592 would remain in service to provide access for the three gas wells located in the area.

An alternative that harvests no timber, constructs no roads, and applies no herbicides that contain the chemical glyphosate – This alternative was considered but eliminated from detailed study because it fails to meet the purpose and need for this project. These include developing and improving the spatial arrangement of age classes in MA 3.0, restoring and maintaining forest health throughout the project area, and regenerating and improving oak stands.

A no-timber harvesting alternative would also not be responsive to the Multiple Use Sustained Yield Act or the National Forest Management Act. Additionally, no timber harvesting on NFS lands is a national issue; and therefore, it is beyond the scope of this project. The no action alternative is also responsive to this concern.

Proposed road construction is needed for vegetative management to meet the purpose and need for the project. Alternative 3 was developed to address the unresolved issue from scoping dropping timber harvesting and road construction in several unroaded areas and in the Painter Run area. As a result, there is 3 miles less of road construction (utilizing new and existing corridors) proposed in Alternative 3 compared to the proposed action (Alternative 1); therefore, Alternative 3 is partially responsive to the concern about not constructing roads. The no action alternative is also responsive to this concern.

There is concern over the use of herbicides for reforestation and other activities. The Forest Plan (USDA-FS 2007a, pp. A-33 to A-36) and associated FEIS reviewed alternatives to herbicides and concluded that herbicides are the most effective, least costly and meet soil, water, health and safety criteria. The use of herbicides to aid in reforestation is a standard practice on NFS land within the ANF. Manual methods have been found to be ineffective in reducing levels of interference to the point where seedlings can become established. There have been no new technological developments since the Forest Plan was published. Herbicides are necessitated by the growth of undesirable species that out compete native desired species, which are important for a healthy forest. The Forest Service has established standards and guidelines in the Forest Plan (USDA-FS 2007a, pp. 54 to 59) to minimize or eliminate the impacts of herbicide application. Potential herbicide effects on human health are reviewed and analyzed in Appendix G (ANF Human Health Risk Assessment, USDA-FS 2007b) of the Forest Plan FEIS. The no action alternative is also responsive to this concern.

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 FY 06 Regeneration and FY 07 Regeneration (pp. 2–3) would occur, including single tree selection (15 acres), herbicide application (28 acres), fencing or tree shelters (28 acres), planting (28 acres), and release for species diversity (64 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, dispersed recreational treatments, and soil and water restoration activities would not occur under this alternative. Remaining Forest Service approved activities in the FY 06 Regeneration and other projects (pp. 2–3) would occur, including single tree selection (15 acres), planting (28 acres), fencing or tree shelter installation (28 acres), herbicide application (28 acres), and release for species diversity (64 acres).

Alternative 3

This alternative was developed to address the unresolved issue identified from scoping. This alternative includes all of the activities proposed in Alternative 1, except for the following stands: 655025, 665014, 665016, 667025, 670019, 670021, 670033, 670036, 678018, 695018, 695033, 695034, 695040, 695065, 705003, 705009, 705012, 705014, 705015, 705016, 705018, 705019, 705020, 706010, and 706023 (These stands are highlighted in Table B-1 in Appendix B). These

stands were dropped from Alternative 3 because constructing roads to access these stands would reduce the size of unroaded areas (greater than 500 acres) or they are located in the Painter Run area. Dropping these stands results in a reduction of timber harvesting on 940 acres (95 acres proposed for intermediate thinning and 845 acres proposed for regeneration harvests, including associated preparatory cuts, shelterwood seed cuts, and shelterwood removal cuts) and associated reforestation treatments. This would also result in approximately 10.4 MMBF less timber harvested in this alternative than in Alternative 1.

Remaining Forest Service approved activities in the FY 06 Regeneration and other projects (pp. 2–3) would occur, including single tree selection (15 acres), planting (28 acres), fencing or tree shelter installation (28 acres), herbicide application (28 acres), and release for species diversity (64 acres).

Table 2–Activities proposed in Alternative 3

Vegetation Management (acres)	
Even-aged Treatments	
Intermediate thinning (non-commercial)	124
Intermediate thinning (commercial)	78
Shelterwood seed cut (1 st entry)/shelterwood removal (2 nd entry)	585
Delayed shelterwood seed cut (2 nd entry)/shelterwood removal (3 rd entry) for non-oak management	364
Preparation cut (1 st entry) /shelterwood seed cut (2 nd entry) /shelterwood removal (3 rd 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)	1001/460/300
Shelterwood seed cut (1 st entry) / shelterwood removal (2 nd entry) for red pine management (temporary openings will be less than 20 acres in MA 2.2 or less than 40 acres in MA 3.0 unless the stand is stocked [regeneration is over 15' tall] at the time of removal then the entire stand could be removed)	182
Uneven-aged Treatments	
Intermediate thinning - Accelerate mature forest condition (AMFC)	50
Single tree selection/ group selection - Restore understory mature forest condition (RUMFC)	126
Understory Vegetation Treatments (acres)	
Herbicide – reforestation	2116
Prescribed burning and scarification	1001
Fence construction and/or tree shelter installation (optional)	2017
Site preparation	2091
Tree planting for species diversity	413
Release for species diversity	2396
Non-native invasive plant species treatments (herbicide and manual)	70
Wildlife Management (acres)	
Planting	27
Install wildlife structures (number)	32
Opening enhancement	30
Aspen regeneration	87
Brush pile creation (number)	20
Fencing and tree shelter installation (optional)	16
Watershed Management (miles)	
Large wood introductions (in streams)	4.7
Recreational Improvements	
Surface armoring of road stream crossings (miles)	8.9
Improve dispersed camping sites (number)	11
Close dispersed camping sites (number)	6
Travel Management (acres)	
Road construction (new corridor)	0.3
Road construction (existing corridor)	2.1
Area cleared in existing stone pits (number of pits/acres)	1/4
Road management change from open to closed on FR402	0.2

Design Features for Alternative 1–Proposed Action

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**).
- Proposed surface armoring **shall** be applied on planned timber haul routes prior to timber hauling (**USDA-FS 2007a, p. 75**).
- Utilize a bridge on FR774B to cross unnamed tributary of East Branch of Millstone Creek stream to minimize soil disturbance at the stream channel and to avoid disturbing groundwater inflow (**USDA-FS 2007a, p. 76**).
- Within 300 feet of the unnamed tributary of East Branch of Millstone Creek, FR774B should be surfaced with limestone (driving surface aggregate) and the ditchlines should be lined with 6 inches of limestone sand to increase the alkalinity and pH of acidic precipitation. This material used must be 92 percent calcium carbonate to improve pH and alkalinity (**USDA-FS 2007a, pp. 75–76**).

NNIP species

- Noxious weed and invasive plant surveys should 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 654010, 654016, and 655025**, timber harvesting will be restricted to winter-only (**USDA-FS 2007a, pp. 65 and 87**).
- In **stand 655025**, apply a buffer of 300 feet from the stream (Dark Hollow) in which no final harvest of timber will occur, herbicide will only be applied manually (no mechanical broadcast equipment), prescribed burning will not occur and fences will not be constructed within this buffer (**USDA-FS 2007a, p. 87**).
- To avoid bisecting a wildlife travel corridor, in the area north of Township Road 300 (**stand 655025**) and in the area south of Township Road 300 (**consisting of stands 654010, 654016 and 654011**), area fences in these two areas will not be present simultaneously; construction of the second fence will only occur after the first constructed fence is removed (**USDA-FS 2007a, p. 87**).
- A biologist will inspect the general area near the road/stream crossing (Dark Hollow) to determine the presence of wood turtles or nests immediately before construction begins at this crossing. If a turtle or nest is observed at this site, construction activities will cease (**USDA-FS 2007a, p. 87**).
- A buffer of 100 feet on either side of a perennial or intermittent stream will be protected

in those locations where prescribed burning is proposed adjacent to these waterways. Prescribed burning will not occur within this buffer and appropriate fire lines will be constructed in order to prevent fire from entering these sensitive areas (USDA-FS 2007a, p. 74).

- In stand 654011, retain and protect all white pine, grapevines and apple trees (USDA-FS 2007a, p. 65).
- In stand 654016, retain and protect all conifer (USDA-FS 2007a, p. 65).
- In stand 665016, retain and protect existing large-whorled pogonia (USDA-FS 2007a, p. 89).
- In stand 666003, retain and protect rocky area near pipeline (USDA-FS 2007a, p. 80).
- In stands 668010, 668013 and 668014, retain and protect all oak trees (USDA-FS 2007a, p. 65).
- In stand 668027, retain and protect all spruce trees in northern portion of stand (USDA-FS 2007a, p. 65).
- In stand 678018, retain and protect all northern red oak trees in northeast portion of stand (USDA-FS 2007a, p. 65).
- In stand 678019, retain and protect all grapevines (USDA-FS 2007a, p. 65).
- In stand 692001, retain and protect existing spicebush shrub layer (USDA-FS 2007a, p. 65).
- In stand 692034, release oak and tulip poplar and retain and protect hobblebush shrub layer (USDA-FS 2007a, p. 65).
- In stand 695014, a 10-acre buffer will be applied in the area where an eastern box turtle was observed. Within this buffer, timber harvest and utilization of heavy equipment will not be permitted (USDA-FS 2007a, p. 87).
- In stand 705003, protect rock outcrop in center of stand (USDA-FS 2007a, p. 80).
- In stand 705012, provide 100-foot buffer around fissure/cave on sidehill (USDA-FS 2007a, p. 80).
- In stand 705020, protect rock outcrops (USDA-FS 2007a, p. 80).
- White pine will not be felled or damaged during implementation of large woody debris introductions into streams (USDA-FS 2007a, p. 65).

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).
- Proposed surface armoring **shall** be applied to FR131 (the Loleta Grade road) on planned timber haul routes prior to timber hauling (USDA-FS 2007a, p. 62).

Scenery and Recreation

- Along SR3002, T304, and the Loleta Grade, (FR131/Allegheny Snowmobile Connector #16), leave ¼ acre buffer areas or feather edges of openings, as needed (Stand 665001,

- 666001, 666002, 666029, 666030, 666034, 667025, 668010, 670020, 670031, 670049, 672052, 677002, 677008, 677009, 677034, 692001)** (USDA-FS 2009c, pp. 7–8).
- Along SR3002, T304, and FR131, landings shall incorporate screening when viewed from a Concern Level CL1 or CL2 travelways and be rehabilitated to mimic natural openings (**Stands 665001, 666002, 666029, 666030, 666034, 667025, 668010, 668014, 668027, 670020, 670031, 670049, 672052, 677002, 677008, 677009, 677034, 692001)** (USDA-FS 2009c, pp. 7–8).
 - Along SR3002, T304, FR131 and Loleta Hiking Trail, a slash disposal zone of 50 feet will be incorporated where slash shall be lopped and scattered to a depth of 3 feet. Treatment should be accomplished within one year of harvesting (**Stands 665001, 666002, 666029, 666030, 666034, 667025, 668010, 668014, 668027, 670020, 670031, 670049, 672052, 677002, 677008, 677009, 677034, 679001, 692001, 692004)** (USDA-FS 2009, pp. 7–8).
 - Along SR3002, T304, and FR131 paint marks shall be placed on trees so as to face away from the CL1 and CL2 travelways. (**Stands 665001, 666002, 666029, 666030, 666034, 667025, 668010, 668014, 668027, 670020, 670031, 670049, 672052, 677002, 677008, 677009, 677034, 692001)** (USDA-FS 2009c, pp. 7–8).
 - Cutting and skidding is prohibited within 200 feet of FR131 on weekends and legal holidays during the established ANF snowmobile season. Safety signs must be placed along the FR131 when operating within 200 feet of the road (**Stands 670020, 670049, 672052)** (USDA-FS 2007a, p. 60).
 - No **hauling** on **FR131** during the established snowmobile season on the ANF on weekends and legal holidays (**USDA-FS 2007a, p. 60**).
 - Snowplowing of designated snowmobile routes (**FR131**) 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**).
 - Directional felling away from the Loleta Hiking Trail shall be used when within 200 feet of the trail. Warning signs shall be posted along the trail at each end of the unit (**Stand 668010, NW corner)** (USDA-FS 2009c, pp. 7–8).

Human Health and Safety

- No herbicide application will occur within 200 feet of the private water source in **Stand 677031** (USDA-FS 2007a, pp. 54–59).

Comparison of Effects by Alternative

Forest Plan standards and guidelines are incorporated into the analysis of Alternative 1 (Proposed Action) and Alternative 3, 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 3–Summary of cumulative effects of implementing Alternative 1–Proposed Action as compared to Alternative 2–No Action and Alternative 3

Resource/Effects Analysis Framework	Alternative 2–No Action	Alternative 1–Proposed Action	Alternative 3
<p>Soils (see Section III, pp. 41–44)</p>	<p>Soil disturbance would occur on less than 15 percent of each harvest area (up to 4 acres total from remaining FY06 Regeneration and FY07 Regeneration units). Temporary soil disturbance would occur during associated reforestation activities and road maintenance (15.2 miles).</p> <p>Proposed road construction or stone pit expansion would not occur.</p>	<p>Soil disturbance would occur on less than 15 percent of each harvest area (up to 489 acres total). Temporary soil disturbance would occur during associated reforestation activities, road maintenance (26.2 miles), and road construction (5.5 miles).</p> <p>Loss of long-term soil productivity from road construction and stone pit expansion would occur (up to 28 acres).</p>	<p>Soil disturbance would occur on less than 15 percent of each harvest area (up to 362 acres total). Temporary soil disturbance would occur during associated reforestation activities, road maintenance (24.4 miles), and road construction (2.5 miles).</p> <p>Loss of long-term soil productivity from road construction and stone pit expansion would occur (up to 15 acres).</p>
<p>Hydrology (see Section III, pp. 44–53)</p>	<p>Stream water quality would improve in the long-term through road maintenance (15.2 miles).</p> <p>Minimal effects to water quantity because less than 25 percent of tree canopy would be removed.</p>	<p>Stream water quality would improve in the long-term road maintenance (26.2 miles) and surface armoring (9.2 miles).</p> <p>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 (4.7 miles).</p>	<p>Stream water quality would improve in the long-term through road maintenance (24.4 miles) and surface armoring (8.9 miles).</p> <p>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 (4.7miles).</p>

Resource/Effects Analysis Framework	Alternative 2–No Action	Alternative 1–Proposed Action	Alternative 3
Air quality (see Section III, pp. 53–58)	<p>No additional direct or indirect effects are anticipated.</p> <p>Cumulative effects, including OGD, are minimal.</p>	<p>Direct and indirect effects due to prescribed burning and timber harvesting are minimal.</p> <p>Cumulative effects, including OGD, are minimal.</p>	<p>Direct and indirect effects due to prescribed burning and timber harvesting are minimal.</p> <p>Cumulative effects, including OGD, are minimal.</p>
Wildlife and Plants (see Section III, pp. 59–76 and Appendix C)	<p>Habitat Fragmentation: Total core area in the cumulative effects analysis area is 14,009; Mean patch size is 110 acres; Number of patches is 127; Largest patch is 2,640 acres.</p> <p>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 treatments. Early age class would comprise eight percent of the cumulative effects analysis area and help achieve the Forest Plan goal of 12 percent in MA 3.0 across the ANF. Mid-to-Late-structural habitat would comprise 91 percent of the cumulative effects analysis area. Large woody introductions would not occur.</p>	<p>Habitat Fragmentation: Total core area reduced by 15 percent to 11,942 acres; Mean patch size reduced by 36 percent to 70 acres; Number of patches increases to 169; Largest patch is 2,554 acres.</p> <p>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 12 percent of the cumulative effects analysis area and help achieve the Forest Plan goal of 12 percent in MA 3.0 across the ANF. Mid-to-late-structural habitat would comprise 87 percent of the cumulative effects analysis area. Aquatic habitat would improve following road and riparian improvements.</p>	<p>Habitat Fragmentation: Total core area reduced by 8 percent to 12,871 acres; Mean patch size reduced by 20 percent to 88 acres; Number of patches increased to 146; Largest patch is 2,589 acres.</p> <p>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 comprise 11 percent of the cumulative effects analysis area and help achieve the Forest Plan goal of 12 percent in MA 3.0 across the ANF. Mid-to-late-structural habitat would comprise 88 percent of the cumulative effects analysis area. Aquatic habitat would improve following road and riparian improvements.</p>

Resource/Effects Analysis Framework	Alternative 2–No Action	Alternative 1–Proposed Action	Alternative 3
<p>Wildlife and Plants (see Section III, pp. 59–76 and Appendix C) (continued)</p>	<p>Management Indicator Species (MIS): Mourning warbler habitat (early structural forest) would be created on one percent in the cumulative effects analysis area. For the remaining MIS, there would be no effects to contribute to local or regional change in habitat quality of these species.</p> <p>Federally listed threatened and endangered species, Regional Forester’s Sensitive Species (RFSS), and species with viability concerns (SVE): No effects are anticipated to jeopardize the continued existence of any of these species or their habitat; Release treatments (839 acres) would likely maintain or increase species diversity.</p> <p>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.</p>	<p>Management Indicator Species (MIS): Mourning warbler habitat (early structural forest) would comprise 12 percent of the cumulative effects analysis area. For the remaining MIS, there would be no effects to contribute to local or regional change in habitat quality of these species.</p> <p>Federally listed threatened and endangered species, RFSS, and SVE: No effects are anticipated to jeopardize the continued existence of any of these species or their habitat; Herbicide application (3,115 acres) coupled with area fencing (3,016 acres) would help restore understory diversity and abundance; Release treatments (3,395 acres) would likely maintain or increase species diversity.</p> <p>Game habitat and migratory birds: A variety of structured habitat would be provided and maintained.</p>	<p>Management Indicator Species (MIS): Mourning warbler habitat (early structural forest) would be created on 11 percent of the cumulative effects analysis area. For the remaining MIS, there would be no effects to contribute to local or regional change in habitat quality of these species.</p> <p>Federally listed threatened and endangered species, RFSS, and SVE: No effects are anticipated to jeopardize the continued existence of any of these species or their habitat; Herbicide application (2,116 acres) coupled with area fencing (2,017 acres) would help restore understory diversity and abundance; Release treatments (2,396 acres) would likely maintain or increase species diversity.</p> <p>Game habitat and migratory birds: A variety of structured habitat would be provided and maintained.</p>
<p>NNIP Species (see Section III, pp.77–80)</p>	<p>Existing NNIP species would continue to spread.</p>	<p>Proposed treatments (70 acres) would lessen the potential for introduction and spread of NNIP species and their impacts native plants and their habitats.</p>	<p>Proposed treatments (70 acres) would lessen the potential for introduction and spread of NNIP species and their impacts native plants and their habitats.</p>

Resource/Effects Analysis Framework	Alternative 2–No Action	Alternative 1–Proposed Action	Alternative 3
Heritage (see Section III, p. 80)	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. 80–85)	<p>No changes are anticipated to Recreation Opportunity Settings (ROS) classifications or inventoried Scenery Integrity Levels (SILs) from approved Forest Service activities.</p> <p>There would be limited effects to recreation activities and use patterns due to timber harvests from previously approved projects. ATV and 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 areas - Steck Run (1,807 acres), Gurgling Run (1,144 acres), Muddy Fork (875 acres), Gregg Hill (864 acres), and West Branch of Millstone (601 acres) (USDA-FS 2003) - would not change.</p> <p>No adverse cumulative effects are anticipated from approved Forest Service activities. Future oil and gas development could bring about a change in ROS, SIL, and recreation activities and their use patterns.</p>	<p>No changes are anticipated to ROS classifications or inventoried SILs from proposed and approved Forest Service activities.</p> <p>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. ATV and snowmobile trail use may be disrupted due to additional vehicle use on haul routes that are also designated as trails. The unroaded area, Gurgling Run, would shrink to 996 acres.</p> <p>No adverse cumulative effects are anticipated from approved Forest Service activities. Future oil and gas development could bring about a change in ROS, SIL, and recreation activities and their use patterns.</p>	<p>No changes are anticipated to ROS classifications or inventoried SILs from proposed and approved Forest Service activities.</p> <p>There would be limited effects to recreation activities and use patterns due to timber harvests. Stone pit development that would provide opportunities for additional access, dispersed camping, target shooting, and parking. ATV and 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 areas would not change.</p> <p>No adverse cumulative effects are anticipated from approved Forest Service activities. Future oil and gas development could bring about a change in ROS, SIL, and recreation activities and their use patterns.</p>

Resource/Effects Analysis Framework	Alternative 2–No Action	Alternative 1–Proposed Action	Alternative 3
Economics (see Section III, pp. 86–87)	Planning costs (\$500,000.00) would occur. Additional wood products would not be provided and additional jobs would not occur. Cumulatively, less returns to Elk County than in Alternatives 1 or 3.	Timber harvesting would provide an economic benefit through jobs produced and provide receipts returned to local school districts and townships and to the U.S. Treasury (\$7,345,800.00). Project costs include planning and implementation (\$13,866,866.00). Net cash flow is (-)\$6,521,066.00.	Timber harvesting would provide an economic benefit through jobs produced and provide receipts returned to local school districts and townships and to the U.S. Treasury (\$4,943,400.00). Project costs include planning and implementation (\$10,020,658.00). Net cash flow is (-)\$5,077,258.00.
Human Health and Safety (Section III, pp. 87–89)	No adverse cumulative effects are anticipated. 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 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 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).	No adverse cumulative effects are anticipated. 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 requirements, and standard operating safety procedures (including OGD operations).

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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 19,135 acres of NFS lands and 7,116 acres of private land. The location of the project area in the 5th level watershed is in Clarion River (25,931 acres) and Spring Creek (320 acres). The majority of the NFS lands within the project area are located within MA 2.2 – Late Structural Linkages (11,320 acres) and MA 3.0 – Even-aged Management (6,770 acres), while the remainder are located in MA 6.1 – Late Structural Habitat (925 acres) and MA 7.1 – Developed Recreation Areas (120 acres) and have not been actively managed for the past 18 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. 3–4 and Section III–Environmental Consequences, pp. 27–34). 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 117 miles of roads: 33 miles of National Forest System (NFS) roads, 23 miles of State and Township roads, and 61 miles of non-system roads, most of which are OGD access roads. The project area also contains approximately 8.5 miles of snowmobile trail and 4.1 miles of hiking trails. The 33 miles of NFS roads within the project area are managed as follows: 14.5 miles as closed, 15.2 miles as open, and 3.2 miles as restricted.

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 91 percent of them greater than 50 years old. The majority of the project area consists of Allegheny and upland hardwood forest types. Approximately 2 percent of the project area (395 acres) is early-structural habitat (zero to 20 years of age).

Table 4–Existing condition (2012) within the project area

Stocking (%)		Age Class (%)		Forest Type (%)	
Non-forest	2	Non-forest	2	Non-forest	2
Non-stocked (0-9)	<1	0 to 20 years (early-structural habitat)	2	Northern hardwoods	2
Poorly stocked (10-34)	6	21 to 50 years (mid-structural habitat)	5	Allegheny hardwood	12
Moderately-stocked (35-69)	32	51 to 90 years (mid-structural habitat)	55	Upland hardwoods	44
Fully-stocked (70-100)	54	91 to 110 years (mid-structural habitat)	32	Conifer	6
Overstocked (greater than 100)	5	111 years and greater (late-structural habitat)	4	Oak	17
				Red Maple	16
				Quaking Aspen	1

Except for 209 acres of Warrant 2543, which are federally owned, the subsurface mineral estates under the project area are privately owned. Currently, there are 116 (active or dormant) private shallow oil and gas wells within the project area. This is about 1 well for every 226 acres within the project area. Shallow oil and gas wells have associated tank batteries, pipelines, additional equipment, power lines, and access roads. Currently, there are no deep gas wells on NFS lands within the project area. There is one Marcellus shale well pad being developed on private land within the project area.

Four future shallow well development scenarios (ranging from 8 to 2,509 new wells) were considered for shallow OGD within the project area (see project file) over the next two decades. The scenario using the projections from the past 5 years was selected because it appears to be the most reasonably foreseeable future estimate of shallow OGD within the project area based on past shallow OGD within the project area and current shallow OGD on the ANF and within the project area. Using this scenario, an additional 8 shallow wells could be developed within the project area resulting in up to 10 acres (0.2 percent of the project area) of additional disturbance over the next 20 years. Deep well 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 a “full field” development scenario. Deep well development is still uncertain as to the intensity and coverage. There is one Marcellus shale well pad being developed on private land within the project area. Deep well development is also occurring to the east and north of the project area. Two scenarios were developed for the project area ranging from 4 to 41 wells. Based on this information and the fact that deep OGD is new and exploratory, the responsible official and ID team projected 20 deep wells (1 well per year) resulting in 200 acres of disturbance (0.8 percent of the project area) over the next 20 years. The potential cumulative effects of private OGD are analyzed by the affected resources. This is not an OGD proposal.

To increase transmission capacity, National Fuel Gas has proposed adding one 24-inch natural gas pipeline to their existing pipeline right of way in the project area, as part of a larger project called the West to East Pipeline Project. Approximately 2 miles of the proposed pipeline lie within the project area, beginning at Overbeck station and heading southeast to the Clarion River. Construction is anticipated to occur during 2013. This would result in approximately 12 acres of forest land being converted to non-forest land. Restoration and monitoring would be completed by summer of 2014.

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 (BER) 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 71–76 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 5—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.

Lists of such activities have been compiled for past, present, and reasonably foreseeable future activities that may potentially contribute to cumulative effects and are located in the project file. 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. 27–34) 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 8 and 10) 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 8 and 10.
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 8 and 10 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 6--Present condition (2012) of forest ages greater than or less than 20 years of age and openings on private lands within the project area (source--aerial photography [GIS-PA MAP])

Activity/Condition	Acres
Water	24
Openings	800
Forests 0-20 Years Old	30
Forests Greater than 20 Years Old	6,262
Total	7,116

Using timber harvests projections for private non-industrial lands from the Forest Plan FEIS (USDA-FS 2007b, Table 3-42, p. 3-177), it is estimated that 1,001 acres of final harvests and 1,878 acres of intermediate timber harvests could occur on the private lands within the project area over the next two decades.

Table 7--Project area summary of past silvicultural treatments on NFS lands (2003--2012)

Treatment	Acres
Salvage cut	143
Fencing	1
Herbicide	2
Site preparation	34

Table 8—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
<i>Even-aged Partial Harvest</i>		Acres	Acres	Acres
Intermediate thinning	2013 to 2032	297	0	202
Preparation cut		1545	0	1001
Total Partial Harvest		1,842	0	1,203
<i>Even-aged Final Harvest</i>				
Shelterwood removal	2013 to 2032	438	38	338
Shelterwood seed cut/removal		1,336	0	1,131
Shelterwood seed cut		773	0	460
Total Final Harvest		2,547	38	1,929
<i>Uneven-aged Management</i>				
Intermediate thinning	2013 to 2032	50	0	50
Single Tree Selection		141	15	141
Total Uneven-aged Harvest		191	15	191
Total Harvest		4,580	53	3,323
<i>Reforestation Treatments</i>				
Herbicide application	2013 to 2032	3,192	28	2,144
Fencing or tree shelter installation		3,044	28	2,045
Site preparation		3,090	0	2,091
Tree planting for species diversity		607	28	441
Release for species diversity		3,459	64	2,460
Prescribed burning and scarification		1,795	0	1,001

Table 9–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	381	2.0	381	2.0	381	2.0	381	2.0
0-10	0	0	890	4.6	0	0	717	3.7
11-20	395	2.1	741	3.9	0	0	628	3.3
21-30	372	1.9	0	0	0	0	0	0
31-40	188	1.0	395	2.1	395	2.1	395	2.1
41-50	417	2.2	372	1.9	372	1.9	372	1.9
51-60	938	4.9	188	1.0	188	1.0	188	1.0
61-70	2,721	14.2	417	2.2	417	2.2	417	2.2
71-80	3,218	16.8	938	4.9	938	4.9	938	4.9
81-90	3,655	19.1	2,697	14.1	2,721	14.2	2,697	14.1
91-100	3,173	16.6	3,113	16.3	3,218	16.8	3,113	16.2
101-110	2,998	15.7	3,369	17.6	3,655	19.1	3,439	18.0
111+	679	3.5	5,634	29.4	6,850	35.8	5,850	30.6
Total	19,135	100	19,135	100	19,135	100	19,135	100

Table 10–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 - Cumulative Effects (2032)	Alt 2	Alt 2 - Cumulative Effects (2032)	Alt 3	Alt 3 – Cumulative Effects (2032)
		Acres/Percent					
Even aged final harvests (temporary openings)							
NFS lands	395	2,547	2,547	0	0	1,929	1,929
Private lands	30	1,001	1,001	1,001	1,001	1,001	1,001
Total final harvests	425	3,548	3,548	1,001	1,001	2,930	2,930
Percent of project area	1.6	13.5	13.5	3.8	3.8	11.2	11.2
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	406	7	413 ^b	0	0	6	412 ^b
Private lands	824	0	824	0	824	0	824
Total acres	1,230	7	1,237	0	824	6	1,236
Percent of project area	4.7	0.0	4.7	0	3.1	0.0	4.7
Oil and gas development (OGD)(includes NFS and private lands)							
Well sites (number)	117	27	144 ^c	27	144 ^c	27	144 ^c
OGD related disturbance	126	200	326 ^d	200	326 ^d	200	326 ^d
Percent of project area	0.5	0.8	1.2	0.8	1.2	0.8	1.2
Total non-forest (OGD and non-OGD)							
Percent of project area	5.2	0.8	5.9	0.8	5.9	0.8	5.9

^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&3).

^c Total includes existing shallow wells (116), estimated shallow wells to be developed within the foreseeable future (8), existing deep wells (1), and estimated deep well pads within the foreseeable future (19).

^d Total includes area disturbed from existing shallow wells (116 acres), area disturbed from estimated shallow wells to be developed within the foreseeable future (10 acres), area disturbed from existing deep well pads (10 pads), and area disturbed from estimated deep well pads within the foreseeable future (190 acres).

Cumulative effects analysis areas vary by resource and extend over space and time (see Table 11). 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 11–Spatial and temporal cumulative effects boundaries by resource area

Resource	Spatial Boundary and Rationale	Temporal Scale and Rationale
Soils	The project area (26,251 acres), including private lands (7116 acres), is the boundary for the cumulative effects analysis. This boundary encloses all the proposed treatment areas in the project and it encloses the headwaters of the major streams within the project area.	Ten (10) years into the past and 20 years into the future is the time frame to analyze potential cumulative effects. Detrimental effects from soil compaction related to a single event are not expected to persist beyond 5 years. Likewise, where ground cover is removed, reestablishment of vegetation can be expected to occur in less than 5 years. This timeframe allows for completion of proposed, remaining approved, and foreseeable future activities.
Hydrology	The cumulative effects analysis area for water resources includes the Millsteck Project Area (see Map 8), which includes 19,135 acres of NFS lands and 7,116 acres of private lands. The cumulative effects analysis area covers 77 percent of the East Branch of Millstone subwatershed (see Table 12), as well as portions of 5 other watersheds. The cumulative effects are not expected to be identifiable using the subwatershed area of all 6 subwatersheds, because this covers 129,280 acres and would dilute the effects. The effects of neighboring projects such as Brush Creek (EA) and Spring Creek (EIS) would not change the cumulative effects because they have similar activity levels as this project, but are spread over a larger area. The project area boundary shows the effects of this project best.	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.

Resource	Spatial Boundary and Rationale	Temporal Scale and Rationale
Air	<p>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.</p>	<p>Ten (10) 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 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 2020 at this time.</p>
Wildlife and Plants	<p>The cumulative effects analysis area may vary depending on the species under consideration, its home range, and potential effects of activities. Within the cumulative effects analysis area, there are no significant barriers, either natural or man-made, that may restrict the natural movement of plants or animals. NFS lands and private parcels share the same drainage pattern, the upper reaches of the Clarion River watershed. Besides sharing similar terrain, aspects and exposure, this land has the same natural disturbances, such as wind and ice storms, and other stresses, such as insect pests and disease. The cumulative effects analysis area was selected based on common land uses, common forest types and conditions, wildlife habitats, climate, and soil types as well as potential future impacts.</p> <p>The southern boundary of the cumulative effects area is the southern bank of the Clarion River, the eastern boundary is Spring Creek, the western boundary is the National Forest proclamation boundary and Forest Roads 157, 130 and 404 comprise the northern boundary. For the Indiana bat and the other threatened or endangered species, the Millsteck cumulative effects area includes a total of 43,683 acres of NFS, State Game Lands and privately-owned land, of which, approximately 11,740 acres is private or state-owned land. The NFS contains 31,943 acres and contains portions of seven management areas but primarily consists of land</p>	<p>The cumulative effects analysis period encompasses the last decade when changes in forest habitat would have occurred during the last planning period to 2032 when reforestation effects such as release cuts and fence maintenance are complete plus a disclosure of activities through the next planning period.</p>

Resource	Spatial Boundary and Rationale	Temporal Scale and Rationale
	<p>managed as MA 3.0 (13,278 acres) and MA 2.2 (12,486 acres). The sub-surface oil and gas rights are privately owned across 98 percent of the cumulative effects analysis area with approximately 937 acres of NFS owned minerals in Warrant 2543 which is located south of Loleta.</p> <p>The locations of past oil and gas developments, Management Areas, locations of major highways, agricultural, residential, commercial and industrial developments and the locations and types of silvicultural treatments proposed within the Millsteck project area were additional factors taken into consideration while developing the cumulative effects boundary. With the exception of the western boundary, it was also conducive to the analysis to include land adjacent to, but outside of, the project boundary in order to take into account some of the attributes previously mentioned. The inclusion of unambiguous landmarks (roads and streams) were preferred and selected as boundaries in order to facilitate a clearly recognizable cumulative effects analysis area.</p>	
<p>NNIP species and Vegetation</p>	<p>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.</p>	<p>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.</p>
<p>Heritage</p>	<p>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.</p>	<p>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.</p>

Resource	Spatial Boundary and Rationale	Temporal Scale and Rationale
<p>Recreation Opportunities and Forest Settings</p>	<p>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.</p> <p>The cumulative effects analysis area for scenery includes the headwaters of the Mill Creek subwatershed (see Map 8). 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 northern half of the project area include two trail connectors of the Allegheny Snowmobile Loop; the western half includes the Loleta Trail. These are all Concern Level 2 corridors that represent a secondary interest in scenery in the project area. The views from these travel corridors are contained within this cumulative effects analysis area.</p>	<p>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 oil and gas development 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.</p> <p>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 oil and gas development activities as related to past, current, and future proposals.</p>
<p>Economics</p>	<p>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.</p>	<p>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.</p>

Resource	Spatial Boundary and Rationale	Temporal Scale and Rationale
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, puddling, and 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 2012, 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. Soil disturbances are mitigated 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) in Alternative 1 (3.0 acres) and Alternative 3 (1.3 acres) and stone pit expansion in both action alternatives (up to 4 acres), none would result in the permanent conversion of land. Approximately 3 acres (0.011 percent of the project area) of the proposed road construction (new corridor) in Alternative 1 and 1.3 acre (0.005 percent of the project area), in Alternative 3, are located on soils designated as farmland. The proposed stone pit expansion is not located on soils designated as farmland.

Environmental Consequences

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

Direct and Indirect Effects

Selection of Alternative 2 (no action) would result in no additional soil disturbance from the proposed Forest Service activities. 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 approximately 15.2 miles of open Forest Service system roads 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 activities would include short-term and long-term effects as described for the action alternatives (Alternative 1—proposed action and Alternative 3).

Alternatives 1 and 3 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.

- Timber harvesting activities would result in localized, small-scale, and short-term soil compaction, puddling and rutting due to the 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 3,230 acres of commercial timber harvests and Alternative 3 proposes approximately 2,386 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 485 acres [2.6 percent of NFS lands within the project area] in Alternative 1 and up to 358 acres [1.9 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 (5.5 miles [23.3 acres] in Alternative 1 and 2.4 miles [10.2 acres] in Alternative 3) and stone pit expansion (up to 4 acres in both action alternatives) 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 (the 15 percent). Road maintenance would occur on 26.2 miles of Forest Service system roads in Alternative 1 and on 24.4 miles in Alternative 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. Armoring of road surfaces (9.2 miles in Alternative 1 and 8.9 miles in Alternative 3) 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 (794 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 NNIP species treatments (70 acres in both action alternatives) 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 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. Activities on private land are often difficult to predict.

GIS data shows 117 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 8 shallow wells and 19 deep wells over the next 20 years. This would result in 200 acres of forest land (0.8 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.

To increase transmission capacity, National Fuel Gas has proposed adding one 24-inch natural gas pipeline to their existing pipeline right of way in the project area, as part of a larger project called the West to East Pipeline Project. Approximately 2 miles of the proposed project lies within the project area, beginning at Overbeck station and heading southeast to the Clarion River. Construction is anticipated to occur during 2013. This would result in approximately 12 acres of forest land being converted to non-forest land. Restoration and monitoring would be completed by summer of 2014.

Approximately 15 acres of timber harvests have been approved previously within the project area. In the Spring Creek FEIS, 0.5 acres of stone pit (FR 228D) expansion and approximately 0.6 miles of non-system road decommissioning were approved within the Millsteck project area. This would result in the conversion of 0.5 acres from forest land and 2.25 acres of non-forest land to forest land for a gain of 2 acres of forest land over time. These activities would result in an additional (up to) 5.25 acres of soil disturbance, which would be mitigated through Forest Plan standards and guidelines, Pennsylvania BMPs, and project design features.

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 forest lands (6,282 acres) (USDA-FS 2007b, p. 3-177, Table 3-42), an additional 434 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 3.5 percent (923 acres) of the cumulative effects analysis area may be affected by timber harvesting and associated reforestation treatments; approximately 3.0 percent (796 acres) in Alternative 3; and approximately 1.7 percent (438 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 conservation 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 219.5 acres of forest land (0.8 percent of the cumulative effects analysis area) would be converted to non-forest land in Alternative 1; 217.8 acres (0.8 percent) in Alternative 3; and 212.5 acres (0.8 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 less than one percent of soil resources (primarily from private OGD) within the cumulative effects analysis area.

Hydrology

Analysis Framework

Forest Plan standards and guidelines 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 zones (100 feet of perennial streams or within 50 feet of intermittent streams) or wetland management zones (100 feet of wetlands, springs, and seeps or within 200 feet of vernal pools). Actions within the riparian zone and wetland management zones area limited to minimize changes to water quality and water quantity (Stuart and Edwards 2006). The Forest Plan FEIS provides documentation, which demonstrates minimal effects to water temperature, nutrient concentrations, and sediment concentrations from proposed activities when Forest Plan standards and guidelines are applied.

Measurable 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 an 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 a 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 only for even-aged silvicultural treatments and included shelterwood seed cuts, shelterwood removal harvests, delayed shelterwood seed cuts, and delayed shelterwood removal harvests. For this analysis, it was assumed that these treatments would result in the total removal of stand basal area; however, up to 10 percent of the stand basal area remains after the final harvest to meet reserve area and snag requirements. 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). For this analysis, we will be assuming hydrologic recovery will occur after 5 years.

New road construction within 300 feet of streams is the activity that has the greatest potential to affect water quality and quantity, while reconstruction of existing corridors and hauling on roads within 300 feet of streams are the next greatest potential impacts (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 system could reduce sedimentation and runoff where roads are improved to Forest Service standards. Road maintenance would correct portions of roads that are contributing increased sedimentation and runoff to streams by diverting water into effective filter and infiltration areas (Scheetz and Bloser 2008)

The hydrology cumulative effects analysis area is the Millsteck project area, which includes 19,135 acres of NFS lands and 7,116 acres of private land. The cumulative effects analysis area is located in six 6th field sub-watersheds, within two 5th field watersheds, and all within the Clarion River 4th field sub-basin (Table 12).

Table 12–Watershed hierarchy for the project area

4 th level subbasin	5 th level watershed	6 th level subwatershed	6 th level subwatershed Project Area Acres	6 th level subwatershed Watershed Area Acres	Major streams within Project Boundary
Clarion River	Clarion River	East Branch Millstone Creek	11,985	16,664	East Branch Millstone Creek
		West Branch Millstone Creek	1,496	15,440	West Branch Millstone Creek
		Millstone Creek	1,952	2,206	Millstone Creek
		Clarion River-Middle Lower	7,680	31,037	Church Run and Wyncoop Run
		Clarion River-Lower	2,817	34,545	Shippen Run
	Spring Creek	Spring Creek	321	29,388	

Protected Water Uses and Criteria Necessary to Protect Each Use

Protected water uses were designated by the Pennsylvania Department of Environmental Protection (DEP) for all Commonwealth waters. Hoffman Run, Wyncoop Run, and all tributaries to Millstone Creek are classified as High Quality – Cold Water Fisheries, and therefore, should be managed to maintain and propagate fish species as well as flora and fauna that are indigenous to cold-water habitats. The remaining streams that are tributaries to the Clarion River are classified

as Cold Water Fisheries and should be managed to maintain and propagates fish species as well as flora and fauna that are indigenous to cold-water habitats.

There are 12 miles of streams in the headwaters of the East Branch of Millstone Creek subwatershed that are listed as impaired from meeting Commonwealth water quality standards (PA DEP 2010). These streams “do not attain protected water uses” due to low pH from “Natural Sources.” These streams include East Branch of Millstone Creek (upstream of the confluence with Muddy Creek), Gurgling Run, and Steck Run, as well as tributaries to these streams. Water chemistry in the area is marginal due to acidic bedrock and soils with low buffering capacity, in combination with acid deposition, which specifically affects mineral content lowering the water’s acid neutralizing capacity (USDA-FS 2007b, p. 3-27). During snow melt or large rain events, episodic acidification can lower pH, acid neutralizing capacity, and alkalinity and release high levels of aluminum by causing a pulse of acids and 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. The alkalinity increase in the downstream direction as the valley floor and deep groundwater add alkalinity to the stream. However, it is likely that during late winter and early spring high flow periods the groundwater input is overwhelmed in the project area by the input of low pH runoff and interflow.

Environmental Consequences

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

Direct and Indirect Effects

For Alternative 1, 0.7 miles of road construction is proposed using new corridors. Of the roads proposed for construction, 0.13 miles of FR 774B would be within 300 feet of streams and have a higher risk of impacting water quality and quantity. This section of road would be surfaced with commercial surfacing to reduce sedimentation.

The proposed 774B road will construct a new road across the headwaters of East Branch of Millstone Creek, which is impaired for low pH. At this crossing, approximately 40 feet length of this stream channel would be disturbed by the crossing. After the initial disturbance of the stream channel for installation of the culvert, the crossing would be designed for aquatic organism passage and should have minimal long term impacts to aquatic organisms or hydrologic flows. Installing a bridge at this location would have almost no impacts to aquatic organisms or hydrologic flows. The approaches to this crossing would also be designed to reduce runoff and sedimentation to streams by following Forest Plan standards and guidelines (e.g. frequently divert water flow to an effective filter and covering the road with durable road surfacing to reduce sedimentation). The hardened surface at approaches to this crossing would increase runoff to this stream. The proposed new stream crossing on FR774B should have the following mitigations applied to improve the pH of this watershed and minimize additional impacts to this impaired watersheds:

- Utilize a bridge to cross this stream to minimize soil disturbance at the stream channel and to avoid disturbing groundwater inflow.
- Within 300 feet of the stream, the road should be surfaced with limestone DSA and the ditchlines should be lined with 6 inches of limestone sand to increase the alkalinity and

pH of acidic precipitation. This material used must be 92 percent calcium carbonate to improve pH and alkalinity.

The remaining segments of new construction are all outside of the riparian corridor for streams and are not anticipated to have effects to water quality.

For Alternative 2, there are no proposed activities on existing roads or trails, so improvements to roads that will reduce sedimentation and runoff would occur at a much slower rate than in Alternative 1 or 3. Alternative 1 would reconstruct 4.8 miles of existing road corridors to Forest Service standards, while Alternative 3 would reconstruct 2.1 miles. Only 0.2 miles of these corridors are within 300 feet of streams on proposed FR 383C in Alternative 1. FR 383C crosses an unnamed tributary to Church Run. This section of road descends a steep hill and delivers sediment laden runoff to Church Run, which would be reduced when commercial surfacing is applied to this stream crossing. Also, this culvert would be designed to minimize impacts to streams and allow for movement of aquatic organisms. Upgrading this road corridor to FS standards and guidelines will reduce sedimentation to Church Run, but this will only occur in Alternative 1.

For Alternative 2, road maintenance is scheduled to occur on 24.4 miles of existing roads that will reduce sedimentation and runoff, but this would occur at a much slower rate than in Alternative 1 or 3. There are nine existing culverts on streams that are aquatic organism passage barriers and would be replaced with properly sized culverts that allow for aquatic organism passage. These would be replaced as money becomes available from the timber sales from the proposed actions. Fewer culverts are predicted to be replaced in Alternative 3 than in Alternative 1. The 9.1 miles of Forest Service system roads within 300 feet of streams would continue to be hydrologically connected to streams and contribute sediment and increased runoff at a high rate in Alternative 2. Commercial surfacing is proposed to be applied in Alternatives 1 and 3 on up to 9.1 miles of roads within 300 feet of streams to reduce sediment delivery to streams compared to pit run surfacing, with more being applied in Alternative 1 relative to revenues generated from timber harvesting. This is expected to reduce the impacts of the heavy truck traffic hauling timber. It is recommended that limestone DSA be applied on the 5.1 miles of road within 300 feet of streams in the impaired watersheds. Limestone DSA application may provide a beneficial effect to water chemistry through the addition of base cations (e.g., calcium and magnesium) to the local watershed, which have the potential to help buffer nearby streams against episodic and chronic acidification. In addition, applying limestone sand to the ditches on existing and new roads at stream crossings will also provide increases in alkalinity.

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 processes, previously approved projects, or private OGD development. No effects to stream flow are predicted as only 7 percent of the project area is in zero to 10 age class, which would decrease over time. In Alternative 1, over the period of the next 20 years, the maximum increase of forest in the zero to 10 age class would increase to 7 percent (1823 acres) of the project area in Alternative 1 and 5 percent (1413 acres) in Alternative 3. Some of the removal treatments would occur earlier in the 20 year period than the delayed removal cuts, which will separate the timing of the basal area reduction by at least 5 years. Due to this delay in removal cuts, the increase of vegetation in the zero to 10 age class is predicted to be 4 percent (1038 acres) of the project area in Alternative 1 and 3 percent (717 acres) in Alternative 3. Vegetation treatments would be spread out over a 20-year period and spread over the project watersheds.

The shelterwood removal treatments were evaluated on 38 small watersheds within the project area to determine if basal area reduction would exceed 25 percent if smaller watersheds were used. Only 23 watersheds had removal harvests on more than 15 acres, and the watershed areas ranged in size from 309 acres to 4,094 acres. Basal area reduction ranged from 0 to 24 percent, of which 8 watersheds ranged from 21 to 24 percent and 5 watersheds were between 10 and 20 percent. The remaining 27 watershed had basal area reductions of less than 10 percent. From this analysis, the following watersheds were identified for further water quality monitoring: Steck Run, East Branch of Millstone Creek (upper), Coalbank Run, Millstone Creek, Church Run, and Hoffman Run.

Herbicide treatments are expected to have no effect on water quality in either action alternative. Under Alternative 1, herbicide applications are proposed on 16.3 percent (up to 3,115 acres) of the project area. The majority of herbicide treatments are located away from streams. Where treatments overlap streams or riparian areas, those resources would be protected through buffers identified in the herbicide standards of the Forest Plan (USDA-FS 2007a, pp. 57-58).

The prescribed burns are expected to have minimal, short-term effects to water quality and quantity. These treatments would be spread over several years. Prescribed burns are low-intensity and are not expected to impact streams or wetlands because revegetation usually occurs very quickly after this disturbance (USDA-FS 2007b, p. 3-41). Proposed prescribed fire 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 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 drafting of water from a stream for this and other incidental uses would be 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. Buffer zones would be applied along streams and wetlands to avoid direct disturbances and minimize erosion near these resources. Anticipated effects would be minimal and short-term in Alternatives 1 and 3, with fewer impacts in Alternative 3 due to less proposed treatment acres.

The Forest Plan FEIS (USDA-FS 2007b) demonstrates minimal effects to water quantity when activities are dispersed over the watershed. Forest plan standards and guidelines (USDA-FS 2007a) would be applied to all proposed activities, and there are no impacts on water quality or quantity anticipated.

The purpose for felling trees into streams is to improve aquatic habitat diversity, trap sediment, and slow flood flows. In Alternative 2, no proposals are made and many streams would continue to have reduced quantities of large wood and have limited high-quality pool habitat. Streambanks would continue to erode and contribute sediment to East Branch of Millstone Creek. The treatments proposed in Alternative 1 and 3 would improve habitat for brook trout in Millstone Creek and its tributaries. This is a riparian improvement prescription that 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 4.7 miles of streams, 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 that there would be areas along these streams where trees would not be felled for large wood introductions due to lack of trees or due to the presence of existing woody debris in the streams. Based on recent aquatic habitat inventories and expected needs in streams, it is anticipated that the need to fell trees in streams to meet aquatic habitat goals is 35 trees per mile.

The improvement of 11 dispersed camping sites and the closure of 6 dispersed camping sites in the project area would minimize impacts to soil and water resources. The majority of these sites are located along East Branch of Millstone Creek. This proposal will reduce compaction and erosion along this stream.

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. During road management, timber sale money will be used to replace nine undersized culverts that would restore aquatic organism passage for 7 streams in the project area. It is predicted that more will be replaced in Alternative 1 than 3. The primary concerns for water quality and water quantity in the Millstone Creek and Clarion River watersheds are roads and their potential to deliver sediment to stream and create fish passage barriers. Road construction using new corridors is proposed in Alternative 1 and 3.

The primary concerns for water quality and water quantity in the Millstone Creek and Clarion River watersheds are roads and their potential to deliver sediment to streams and create fish passage barriers. Road construction using new corridors is proposed in Alternatives 1 and 3. In Alternative 1, 0.13 miles of new road would be constructed within 300 feet of streams. One of these roads would construct a new stream crossing over the East Branch of Millstone Creek, a perennial stream listed as impaired by the Pennsylvania Department of Environmental Protection. If Alternative 1 is selected, the mitigation measures listed for the impaired watershed need to be followed. Utilizing a bridge at this crossing would minimize disturbance to this stream channel. The roads in Alternative 3 have a lower risk of causing water quality problems because there would be no new perennial stream crossings and only 0.1 mile of new road 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 about 2.1 acres would be disturbed in Alternative 2 and 0.4 acres would be disturbed in Alternative 3. This is not expected to cause negative changes to stream flow since streams and wetlands would be avoided. Due to the new stream crossing in Alternative 1, water quality and streamflow changes are predicted to be greater than Alternative 3. New road construction activities would follow Forest Plan standards and guidelines to minimize the extent of these impacts.

There may be improvements in stream conditions where proposed road construction occurs on existing corridors because commercial surfacing would be applied and runoff concerns would be mitigated. Sediment reductions will be the greatest on the proposed reconstruction of FR383C at the stream crossing of an unnamed tributary to Church Run in Alternative 1. Since this road would not be improved in Alternative 3, water quality benefits would be slightly less than Alternative 1.

In Alternative 2, no effects to stream flow are predicted as the amount of forest in the zero to 10 age class would decrease. Based on the implementation of timber harvest activities proposed 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 7.2 percent of the cumulative effects analysis area. Approximately 15 acres of timber harvests have been approved previously within the project area on NFS lands and an estimated 885 acres is expected over the next 20 years on private land. This increases the maximum amount of forest in zero to 10 age class to 10.4 percent. Therefore, increased stream flow is not anticipated as basal area reduction would not exceed 25 percent in the cumulative effects analysis area.

Cumulative effects on water quality from herbicide treatments are not expected in any alternative. Under Alternative 1, herbicide applications are proposed on 16 percent (up to 3,115 acres) of the project area and on 2,116 acres in Alternative 3. The majority of these treatments are located away from streams. Those stands that overlap streams or riparian areas would be protected through herbicide buffers identified in the Forest Plan (USDA-FS 2007a, pp. 57-58).

There are currently an estimated 117 oil and gas wells impacting 117 acres of NFS and private lands within the cumulative effects analysis area. Over the next 20 years, approximately 8 new shallow wells and 19 deep well pads (approximately 200 acres) could be developed on NFS and private lands in the cumulative effects analysis area. In addition, National Fuel Gas is proposing the West to East pipeline expansion that will convert an additional 12 acres from forest to non-forest. These activities would result in the disturbance of up to 0.9 percent (232 acres) of the cumulative effects analysis area. In 2032, it is predicted that less than 1 percent of the project area could be impacted by OGD. This includes impacts from 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 in from a DEP approved surface or groundwater withdrawal site. In the cumulative effects analysis area, water for hydraulic fracturing could potentially be withdrawn from Millstone Creek, Millstone Creek, or the Clarion River. These streams are listed by the Commonwealth of Pennsylvania as impaired (PA-DEP 2010). Withdrawal would not occur on the section of the East Branch of Millstone Creek listed as impaired by the Pennsylvania DEP because the streamflow is too small and water withdrawal may have a negative effect on stream pH.

Shallow wells generally use between 30,000 and 50,000 gallons of water (Kuzma and Gleason 2009, personal communication). In the cumulative effects analysis area, we predict that an average of 2 wells every 5 years would use a total of 100,000 gallons every 5 years or 20,000 gallons per year. Withdrawal of surface water typically occurs at larger streams for ease of pumping and to minimize the effects to the stream. The East Branch of Millstone Creek above the confluence of the West Branch of Millstone Creek has an average base flow of 20.4 cubic feet per second or 13,184,830 gallons per day. Assuming operators would withdraw water for only 1 well per day at 50,000 gallons per day; this represents less than 1 percent of the in-stream flow of the East Branch of Millstone Creek.

Marcellus shale well pads may use three to five million gallons of water (Kuzma and Gleason 2009, personal communication). 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. 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. 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 13–Effects of proposed activities on water quality and quantity

Proposed Activity	Alternative 2–No Action	Alternative 1–Proposed Action and Alternative 3
Miles of road maintained, within 300 feet of a stream	Road maintenance activities would reduce hydrologic connectivity of roads to streams resulting in a reduction in the volume of road derived runoff and sediment entering streams, but at a slower rate than in Alternative 1 or 3.	Road maintenance would be greatest in Alternative 1 and slightly less in Alternative 3, resulting in a greater reduction in the volume of road derived runoff and sediment entering area streams than in the no action alternative.
Miles of existing road corridor within 300' 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.	Alternative 1 – 0.2 miles of existing road corridor would be reconstructed, reducing a sediment source and possible passage barrier on Church Run. Alternative 3 – No roads within 300 feet of streams would be reconstructed, although a reduction in runoff and sediment may be observed near unmapped ephemeral streams, springs, and seeps.
Miles of new road constructed within 300' of a stream.	No new roads would be constructed within 300' of a stream.	Alternative 1 – 0.13 miles of new road would be constructed, with a possibility of increased runoff reaching a stream at the new stream crossing. Alternative 3 – No new road would be constructed within 300 feet of a stream.
Number of new perennial stream crossings.	No new perennial stream crossings.	Alternative 1 – One new perennial stream crossing. Alternative 3 – No new perennial stream crossings.
Miles of road receiving commercial driving surface aggregate (DSA) surfacing within 300' of a stream	Sedimentation would remain the same or improve slowly as money is allotted to improve sections of roads.	Addition of improved surfacing is expected to minimize the effects of heavy truck traffic and reduce overall sedimentation in the project area.
Miles of road receiving limestone DSA	Unmitigated effects of acid rain and a reduction in soil buffering capacity (base cations) resulting in reduced water quality.	Limestone surfacing would improve water quality through the addition of base cations in the subwatershed.

Proposed Activity	Alternative 2–No Action	Alternative 1–Proposed Action and Alternative 3
Even-aged treatments resulting in basal area (BA) percent reductions.	BA reductions would only be through natural processes, previously approved projects, or OGD development. No effects are anticipated to water quantity as BA reduction would be less than 25 percent.	Proposed treatments would reduce basal area by up to 7 percent. No measurable effects in water quantity are anticipated: less than or equal to 10.4 percent BA reduction in the cumulative effects analysis area from even-aged treatments on NFS and private lands. And adding potential future oil and gas development, BA reduction less than or equal to 11.7 percent. For the BA reduction, Alternative 3 would have slightly lower effects than Alternative 1.
Miles of large wood placement in streams.	Many streams would continue to have reduced quantities of large wood and have limited high-quality pool habitat. Stream banks would continue to erode and contribute sediment to East Branch of Millstone Creek.	Large wood and in-stream structures added to streams would be added to 4.7 miles of streams that would increase stream channel complexity and aquatic habitat. 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. Only beneficial long-term impacts are expected.
* For the basal area reduction indicator, Alternative 3 would have slightly lower effects as Alternative 1, but the 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 and can be hazardous to human health, 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 (O₃), sulfur dioxide (SO₂), carbon monoxide (CO), nitrogen dioxide (NO₂), particulate matter (PM_{2.5, 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. Proposed activities that may create ozone include motor vehicle exhaust and gasoline vapors from timber harvest and OGD.

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).

Created by fossil fuel combustion at power plants and other industrial facilities, sulfur dioxide is a highly reactive gas, which has adverse effects on the respiratory system. Other sources of sulfur dioxide 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 in the project area that would create SO₂ 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, and 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 for the ANF.

Monitoring of the NAAQS occurs at the state level and is enforced through an 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 Department of Environmental Protection (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 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. Two EPA-approved monitoring stations for sulfur dioxide are located in Warren, Pennsylvania and the nearest two monitoring stations for lead are located near Pittsburgh, Pennsylvania (graphs and explanation can be found online at <http://www.epa.gov/air/urbanair/> and in the project file).

Environmental Consequences

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

Direct and Indirect Effects

Table 14 illustrates the direct and indirect effects prescribed fire, OGD, and timber harvest then 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 will implement the treatments proposed including silvicultural activities and prescribed burning. For timber harvest, there is 10.2 MMBF expected to be harvested in the first entry (2014-2015), 13.7 MMBF expected to be harvested in the second entry (2021-2025), and 6.7 MMBF in the third entry (2029-2031). The greatest number of acres that is expected to be prescribe burned in one year for Alternatives 1 and 3 would be about 400 acres of forest understory. Alternative 3 differs from Alternative 1 in that there is a reduced amount of timber harvesting: 6.7 MMBF to be harvested in the first entry, 9.4 MMBF in the second entry, and 5.3 MMBF in the third entry.

The amount of pollutants added to the atmosphere by dispersed proposed activities in Alternatives 1 and 3 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. 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 inhalation of fine particulates. Mitigation measures will be employed in smoke sensitive areas to avoid concentrating smoke in concentrated population 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 15).

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. 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 2010a).

Table 14—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 2020 (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 in Four County Emissions (Tons/Year)			
	2012	2015	2020	2012	2015	2020	2012	2015	2020	2012	2015	2020	2012	2015	2020	
Alt 1	VOC	0	9	9	1	4	1	3	3	3	9,615	8,886	7,671	0.04	0.18	0.17
	NO _x	0	4	4	2	13	2	14	14	14	3,992	4,151	4,416	0.15	0.31	0.21
	CO	0	200	200	7	38	6	29	29	29	10,378	10,135	9,731	0.07	0.54	0.55
	PM	0	20	20	0	1	0	1	1	1	53,571	49,613	43,018	0.03	0.53	0.48
Alt 2	VOC	0	0	0	1	1	1	3	3	3	9,615	8,886	7,671	0.04	0.05	0.05
	NO _x	0	0	0	2	2	2	14	14	14	3,992	4,151	4,416	0.15	0.16	0.16
	CO	0	0	0	7	6	6	29	29	29	10,378	10,135	9,731	0.07	0.07	0.08
	PM	0	0	0	0	0	0	1	1	1	53,571	49,613	43,018	0.03	0.02	0.02
Alt 3	VOC	0	9	9	1	3	1	3	3	3	9,615	8,886	7,671	0.04	0.17	0.17
	NO _x	0	4	4	2	10	2	14	14	14	3,992	4,151	4,416	0.15	0.28	0.21
	CO	0	200	200	7	27	6	29	29	29	10,378	10,135	9,731	0.07	0.52	0.55
	PM	0	20	20	0	1	0	1	1	1	53,571	49,613	43,018	0.03	0.53	0.48

Cumulative Effects

The largest emissions of ozone precursors (volatile organic compounds and nitrogen oxides) are due to private OGD (Table 14). Private OGD emissions include all the equipment from normal maintenance of operating wells in addition to predicted emissions from new OGD. Increases in emissions for OGD between 2012 and 2020 are due to additional wells that are anticipated to be developed within the project area. However, it is expected that ozone concentrations will continue to decrease in the four-county area as measured at the KEF monitoring station 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.

Volatile organic compounds are another ozone precursor. The largest source of volatile organic compounds in Alternatives 1 and 3 is prescribed fire. The emissions from prescribed fire are of a short duration and prescribed fires will only be accomplished on days when the smoke will disperse rapidly. Therefore, it is not expected that the emissions from the ANF will 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 KEF, since ozone precursors (VOC and NO_x) 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 four-county and project area. In Alternatives 1 and 3, the largest emissions source of particulate matter is due to proposed prescribed burning. The emissions from prescribed burning are of short duration, and prescribed burns would only be accomplished on days when smoke would disperse rapidly. Therefore, it is not expected that the emissions from ANF management activities would have an effect on the continued attainment status for particulate matter in the project area.

Carbon Monoxide emissions are similar between prescribed fire and OGD. As shown in Table 14, carbon monoxide measurements by the Pennsylvania DEP in Erie and Pittsburgh are well below the NAAQS. Expected carbon monoxide emissions due to the proposed action are not expected to have an effect on the continued attainment status for 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, harvesting 991 MBF of timber per year is expected on private land in the project area through 2020. In the project area under Alternative 2, there is a proposal to harvest 56 MBF of timber on the ANF in 2012 only, from a previously approved Environmental Assessment. There would be no additional emissions from pollutants other than the previously approved harvesting occurring in 2012, and emissions from timber harvesting on private land.

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 a Marcellus shale well site on air quality in the project area are currently unavailable. Currently, the US EPA in the state of New York and the Commonwealth of Pennsylvania, are studying the possible effects that Marcellus shale wells have on the environment. The National Energy Technology Laboratory monitored air quality on the ANF in 2010. 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 the proposed Marcellus wells in the project area will exceed any of the NAAQS.

Table 15—Criteria pollutant monitoring data, NAAQS compared to Pennsylvania DEP measurements, as would be reported by EPA for attainment designation. (US EPA 2012a)

Criteria Pollutant	Primary National Ambient Air Quality Standard (Averaging Time)	2012 PA DEP Bureau of Air Quality Air Monitoring Data	Attainment
Ozone	0.075 ppm (8 hour)	0.073 ^a ppm	Yes
Sulfur dioxide	0.03 ppm (annual)	0.004 ^b ppm	Yes
Carbon monoxide	9.0 ppm (8 hour)	1.1 ^a ppm	Yes
Nitrogen dioxide	0.053 ppm (annual)	0.007 ^a ppm	Yes
Particulate matter (PM ₁₀)	150 µg/m ³ (24 hour)	47 ^a µg/m ³	Yes
Particulate matter (PM _{2.5})	15.0 µg/m ³ (annual)	10.7 ^a µg/m ³	Yes
Lead	0.15 µg/m ³ (3 month average)	0.09 ^c µg/m ³	Yes

^a Monitor located in Erie, Pennsylvania.

^b Monitor located in Warren, Pennsylvania.

^c Monitor located in Beaver County, Pennsylvania.

µg/m³ equals micrograms per cubic meter.

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 wildlife report (in project file), project biological assessment (BA) (Appendix C) and project biological evaluation and wildlife report (BER) (in project file). 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 RFSS list was updated based on coordination with the Regional Office. The review of available information and subsequent species viability evaluations resulted in a finalized list of 81 RFSS for the ANF. In addition, there are ten species which have viability concerns and are not included on the RFSS or threatened or endangered lists. There are eight Federally-listed species and one Candidate species analyzed in the project BA. Since completion of the Forest Biological Evaluation in 2007, the USDI-FWS has designated the rayed-bean 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 the 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 an average stand diameter at breast height [DBH] greater than 4 inches and a year of origin less than 1989), young forest (stands with an average stand DBH less than 4 inches and a year of origin greater than 1988), 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 “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.
- 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).
- Edge density – amount of edge relative to the landscape area (total edge divided by total core area). Edge density standardizes edge to a per unit area basis that facilitates comparisons among landscapes of varying size. However, when comparing classes or landscapes of identical size, total edge and edge density are completely redundant. Alternatively, the amount of edge present in a class or landscape can be compared to that expected for a maximally compact class or landscape of the same size but with a simple geometric shape (such as a square) and no internal edge, respectively.

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 14,009 acres of core area (total of all the patches), in 127 patches, with a mean patch size of 110 acres, and the largest patch being 2,640 acres in size. Total edge is 225 miles with an edge density of 84 feet per acre. “Mature forest” (greater than 20 years of age) makes up approximately 13,964 acres of the total core area and young forest core makes up 10 acres of the total core area. Patch size ranges from 1 acre to 2,640 acres. See Figure 1.

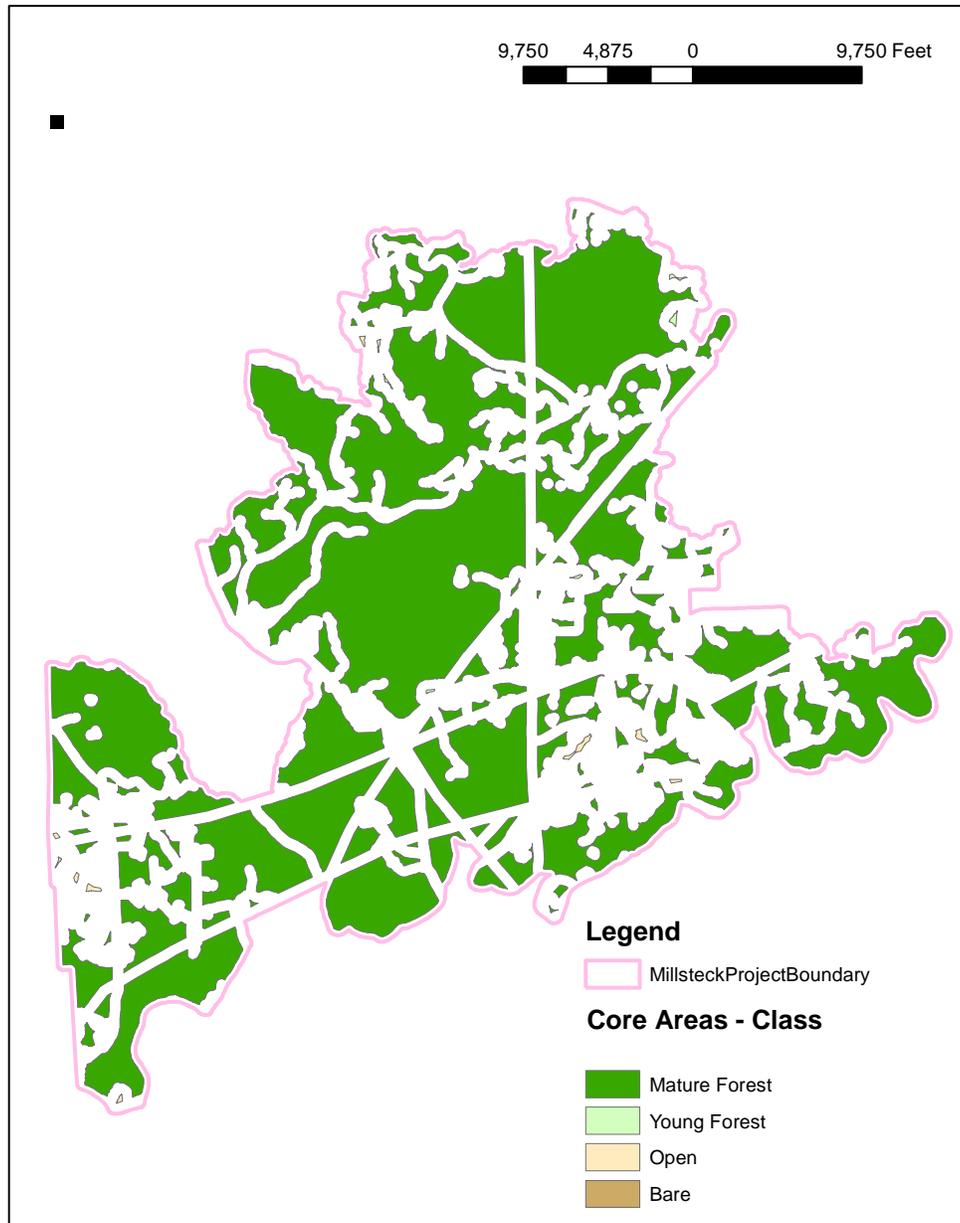


Figure 1–Existing condition for project area

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.

For Alternative 1, an estimated 1,554 acres of young forest would be created through even-aged final harvests. Proposed activities would reduce the total core area by 14.8 percent to 11,942 acres, reduce the mean patch size by 36 percent to 70 acres with the largest patch being 2,554 acres in size, and increase the number of patches to 169. Total edge would increase by 3 percent (231.8 miles) and edge density increases by 21 percent to 102 feet per acre. Young forest core would increase to 612 acres.

For Alternative 3, an estimated 1,268 acres of young forest would be created through even-aged final harvests. Proposed activities would reduce the total core area by 8.1 percent to 12,871 acres, reduce the mean patch size by 20 percent to 88 acres with the largest patch being 2,589 acres in size, and increase the number of patches to 146. Total edge decreases by 0.8 percent (to 222.8 miles) and edge density increases by 8 percent to 91 feet per acre. Young forest core would increase to 361 acres.

Table 16–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) ^b	Edge density (feet/acre) ^b
Existing condition and Alternative 2–No Action	14,009	127	110	2,640	224.6	84
Alternative 1–Proposed Action	11,942	169	70	2,554	231.8	102
Alternative 3	12,871	146	88	2,589	222.8	91

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

^b. Total amount of edge in a landscape is important to many ecological functions. As total core area and total edge is reduced, edge density increases.

Cumulative Effects

There are 600 acres of approved even-aged final harvests included in the cumulative effects analysis area with the proposed activities using patch analyst. 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 21,864 acres with 174 patches and a mean patch size of 126 acres. The largest patch is 3,179 acres (See Figure 2). Total edge is 355.2 miles and edge density is 85.7 feet per acres. There would be approximately 21,864 acres of the mature forest core area and 18 acres of young forest core area.

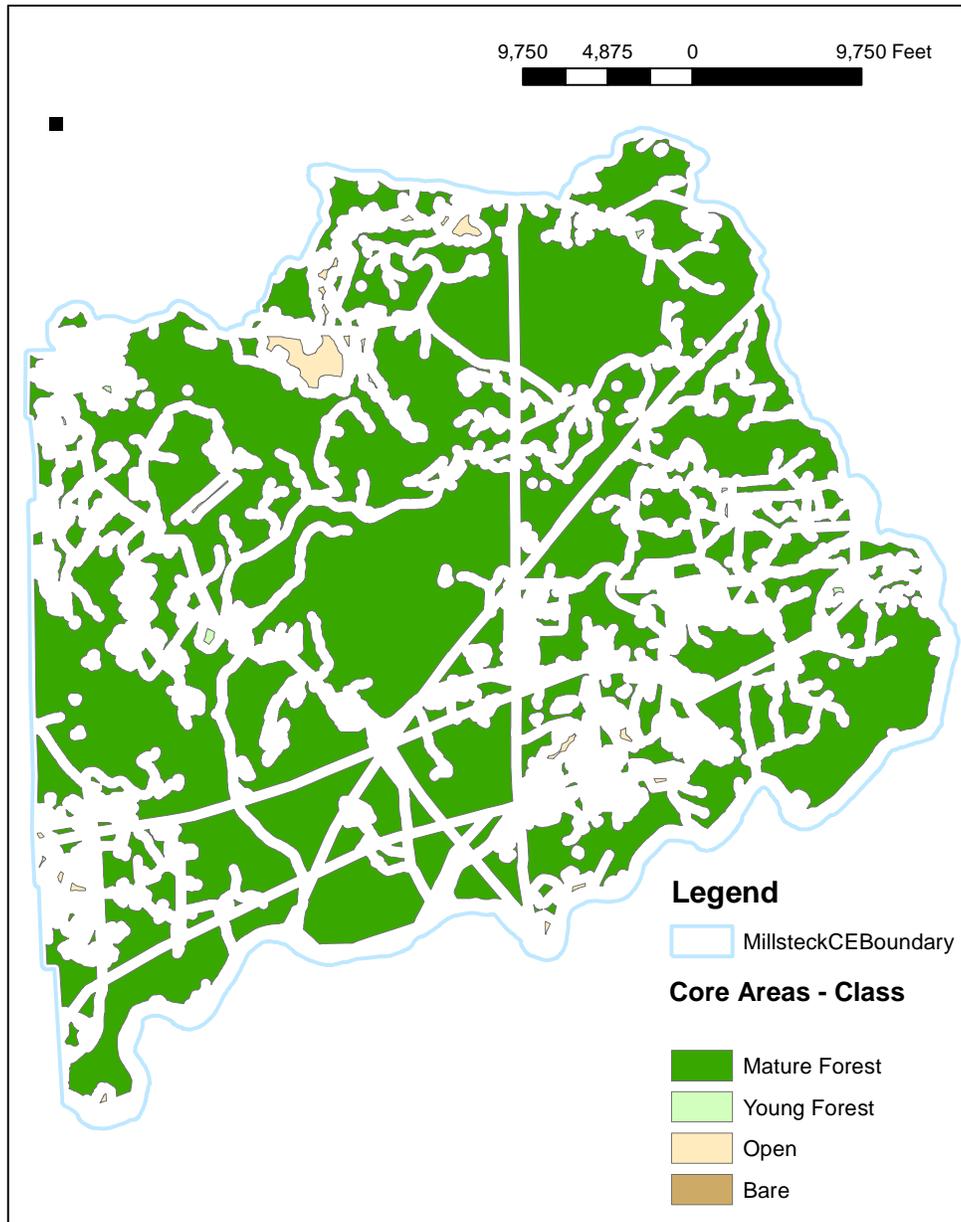


Figure 2—Patch analysis results of cumulative effects in Alternative 2

For Alternative 1, when compared with the existing condition, the proposed treatments, previously approved treatments reduce the total core area by 8 percent to 19,597 acres, reduce the mean patch size by 23 percent to 89 acres with the largest patch being 2,594 acres in size, and increase the number of patches to 221 (see Figure 3). Total edge actually increases by 2.2 percent (to 364.6 miles) and edge density increases by 12 percent to 98 feet per acre. There would be approximately 18,753 acres of the core mature forest area and young forest core area would increase to 612 acres from 29 acres (existing condition).

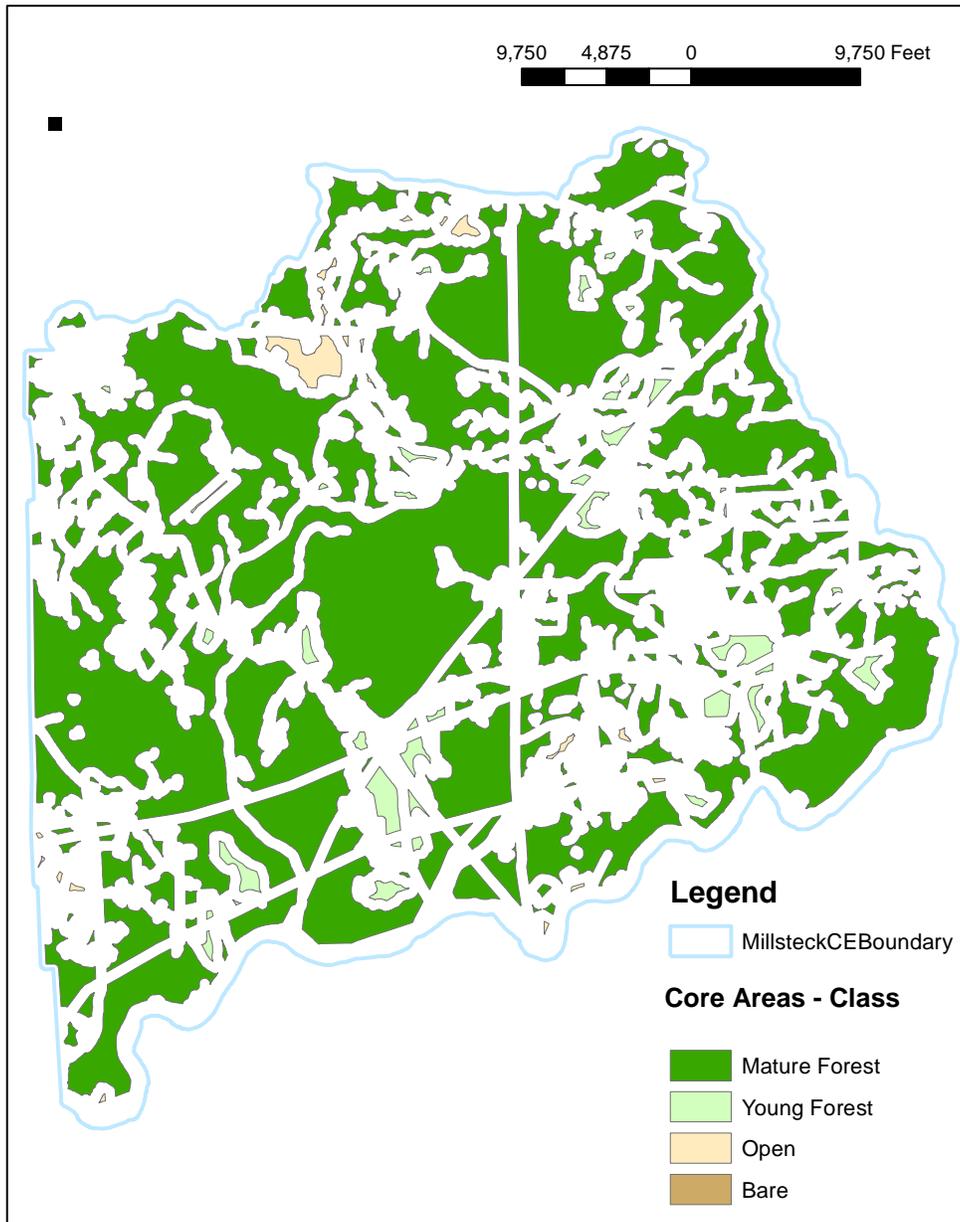


Figure 3—Patch analysis results of cumulative effects in Alternative 1

For Alternative 3, proposed and approved would reduce the total core area by 3 percent to 20,581 acres, reduce the mean patch size by 11 percent to 103 acres with the largest patch being 3,001 acres in size, and increase the number of patches to 199 (see Figure 4). Total edge actually decreases by 8 percent to (353.8 miles), but edge density increases by 3 percent to 91 feet per acre. There would be approximately 19,986 acres of mature forest core area and young forest core area would increase to 363 acres from 29 acres (existing condition).

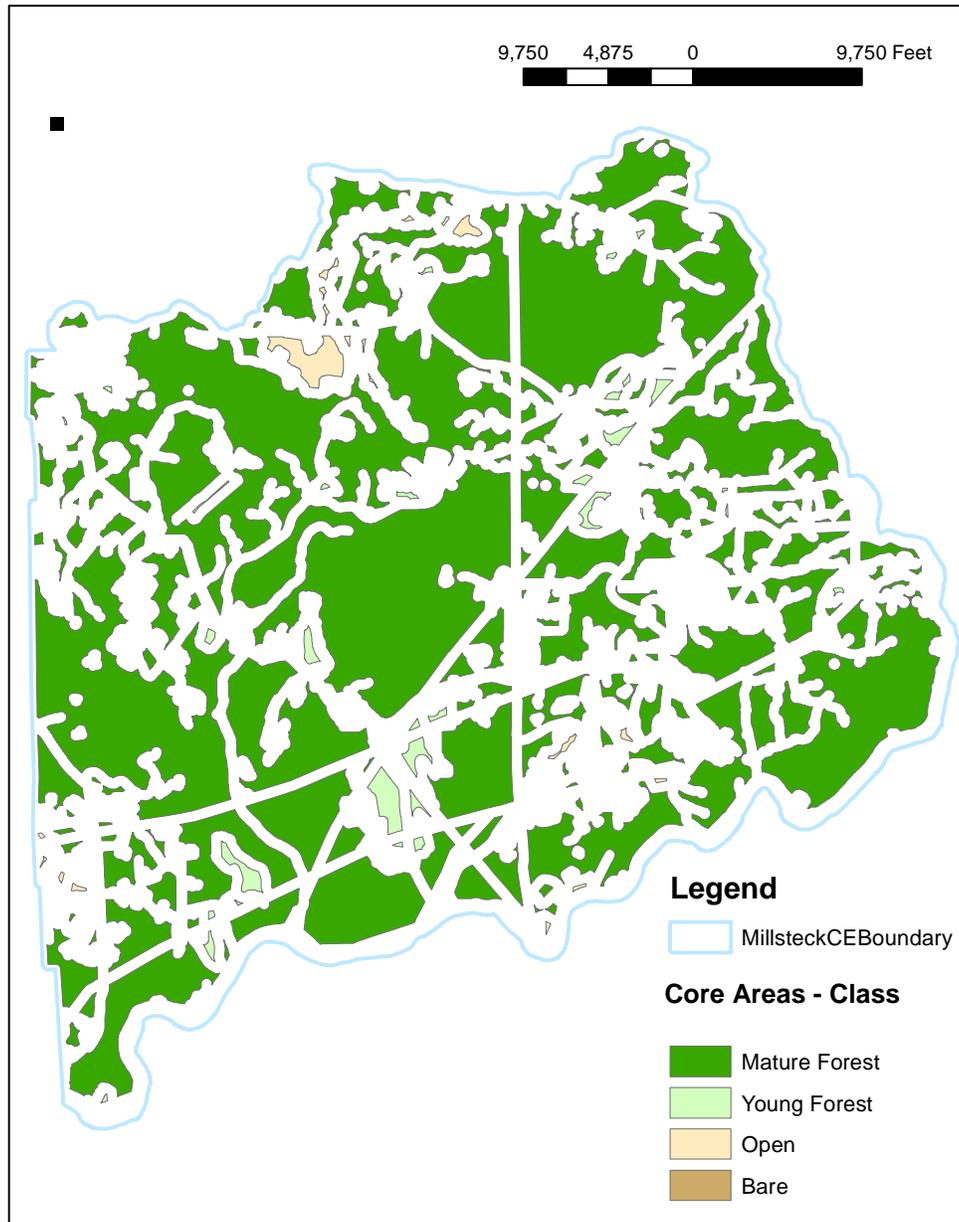


Figure 4—Patch analysis results of cumulative effects in Alternative 3

Based on the analysis, mature forest core areas are retained under all of the alternatives, but would be reduced in size under Alternatives 1 and 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, and distribution. Suitable habitat would be provided for wildlife species such as the northern goshawk and timber rattlesnake that utilize interior mature forest habitat in all alternatives. Alternative 2 provides more mature forest core areas, of larger size, in less convoluted shapes, with reduced levels of habitat isolations, and with more habitat linkages than Alternative 1 and 3. Under Alternative 1 and to a lesser extent Alternative 3, species that utilize younger forest and are able to tolerate greater levels of disturbance would likely see greater benefits.

Table 17–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	Edge density (feet/acre) ^b
Existing condition	21,409	185	116	2,640	356.7	87.9
Alternative 2–No Action	21,864	174	126	3,179	355.2	85.7
Alternative 1–Proposed Action	19,597	221	89	2,594	364.6	98.2
Alternative 3	20,581	199	103	3,001	353.8	90.7

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

^b Total amount of edge in a landscape is important to many ecological functions. As total core area and total edge is reduced, edge density increases.

Threatened, Endangered, and Regional Forester Sensitive Species

For the eight federally listed threatened and endangered species and one candidate species on the ANF, none have occupied habitat in the project area. Suitable habitat is present for three species, Indiana bat, small-whorled pogonia, and northeastern bulrush, but none of these have been documented in the project area.

Twelve (12) Regional Forester Sensitive Species (RFSS), including the little brown myotis, northern myotis, timber rattlesnake, wood turtle, butternut, American ginseng, mountain brook lamprey, and five species of dragonflies, have been documented in or adjacent to the project area and the project area is considered to be occupied habitat for these species.

For 57 RFSS, including two mammals, four birds, two amphibians, one mussel, 21 insects, five fish, and 22 rare plants the project area contains suitable habitat but their presence has not been documented. No suitable habitat exists within the project area for 12 RFSS including seven mussels and 5 species of fish. The streams, riparian areas, and wetlands, along with mature deciduous and mixed deciduous and conifer forest found in the project area currently provides suitable but unoccupied habitat for 58 current RFSS (see project BE, in project file). Although suitable habitat would be altered by vegetation management and transportation activities, none of these 57 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 (up to) 5.5 miles of road construction and stone pit expansion (up to 4 acres). An additional 212 acres (less than 1 percent) of the project area may be impacted by future OGD and proposed pipeline expansion. Even with this conversion of habitat, an estimated 81 percent of the cumulative effects analysis 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 12 RFSS and two endangered species (clubshell mussel and northern riffleshell mussel) 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 “no impact” determination was also reached for the mountain brook lamprey and five species of dragonflies with implementation of Forest Plan standards and

guidelines, Pennsylvania BMPs, and project design features.

A may impact individuals, but not likely to cause a trend toward federal listing determination or loss of species viability was reached for six RFSS (little brown myotis, northern myotis, timber rattlesnake, wood turtle, butternut, and American ginseng). 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 current 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. This species has not been documented in the project area but could be expected to be found here as approximately 17 percent of the project area consists of stands composed of over 50 percent oak. Therefore, no adverse effects are anticipated to the cerulean warbler from the proposed activities under either action alternative.

Mid- to late-structural habitat would be retained on at least 81 percent of the cumulative effects analysis area under Alternatives 1 and 3 by 2032, and would provide stop-over habitat for the warbler during spring and fall migration. If individual or small groups of oak trees are found in the proposed timber harvest areas, these unique inclusions would be retained, whenever possible.

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. Millstone Creek basin and Wyncoop Run are within the project area and 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. In general, pH, conductivities and alkalinities were very low which could be attributed to either natural geology of the watersheds or acid deposition. Most of the streams were also found to have very low mayfly diversity which can be attributed to the very low productivity of these streams (J. Brancato, personal communication). Currently, 22 streams are crossed by township or forest roads which may be used to haul timber

products and of these, ten of the forest roads are sites where road reconstruction or maintenance activities are planned. Approximately 9.2 miles of surface armoring is proposed under both action alternatives on forest roads located within 300 feet of streams.

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 73 percent of the cumulative effects analysis area is NFS lands with the remaining 27 percent being private 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. Young forest habitat is important to many game species and a number of species with viability concerns. Currently, 2 percent of the project area provides early structural habitat (0-20 years old). The project area is considered suitable unoccupied breeding habitat for this species.

Approximately 741 acres (in Alternative 1) and 628 acres (in Alternative 3) of proposed even-aged regeneration harvests would create early structural habitat on 4 or 3 percent of the project area, respectively, by 2022. By 2032, in Alternative 1, approximately 9 percent and 7 percent in Alternative 3 of the cumulative effects analysis area is expected to be early structural forest, and less than 1 percent in Alternative 2. Early structural habitat would increase over the next two decades in Alternatives 1 and 3 and decrease under Alternative 2. Projected OGD would increase opening (non-forest) habitat by approximately 1 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 warrant attention but are 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, the remaining nine species with viability concerns have suitable habitat within the project area. The list of seven birds, two reptiles and one amphibian and their status in the project area can be found in the wildlife report (in project file).

Black-throated blue warbler, red-shouldered hawk, raven, and Swainson's thrush

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 85 percent of the project and at least 81 percent of the 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 (11 percent of the project area) consists of a mixture of understory, midstory, and overstory conifers and is expected to retain relatively intact 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 white pine plantings would supplement the conifer component in the project area. Introductions of large wood into sections of four stream corridors will not adversely impact these species. Private oil and gas developers are encouraged to follow Forest Plan standards and guidelines, which protect these species and their habitat. Currently, there are no red-shouldered hawk raptor or raven nests 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

According to Brauning (1992), nest sites may be several miles from foraging areas. Since the project area is located between Buzzard Swamp and the Clarion River, two areas where ospreys have been documented, it is presumed that the project area contains suitable nesting habitat. Although the project area contains small water impoundments which hold fish, the small sizes of these impoundments (and limited food supply) probably deters continual use by resident ospreys and are not considered primary foraging areas. If an osprey nest is discovered within the project area (or anywhere on NFS lands) specific Forest Plan standards and guidelines would be considered to avoid or minimize nest disturbance.

Great blue heron

A small heron rookery in the project area was documented as active within the last five years; however this rookery has not been utilized for the past three years. Heron nests were still present in 2011 but were in poor condition and deteriorating. The project area can be assumed to provide a minimal amount of foraging habitat. 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 85 percent of the project area in Alternatives 1 and 3 in 2032. Aside from the selective tree-felling associated with large wood introductions into stream corridors, large diameter trees and snags would remain throughout the project area in riparian areas; therefore, nesting opportunities would remain. In the event the existing rookery becomes active again or a new rookery is found in the future, Forest Plan standards and guidelines will be implemented to protect it.

Henslow sparrow

Although the Buzzard Swamp complex of grasslands is located within the cumulative effects analysis area, there has been no documented occurrence of this species within the project or cumulative effects analysis area. No activities which would be considered detrimental to this species are scheduled to occur; therefore there would be no effect to this species or its habitat.

Golden-winged warbler

Suitable seedling/sapling habitat (0-20 years old) is expected to increase in the project area due to management activities under Alternatives 1 and 3. By 2022, this habitat will represent at least 3 percent of the project area. Shrub components within mature forest and along riparian areas are retained using Forest Plan standards and guidelines regardless of the treatments. There have been no documented occurrences of the golden-winged warbler within the project area. Habitat for this species is expected to increase in the area.

Jefferson salamander, four-toed salamander, and eastern box turtle

The Jefferson salamander and four-toed salamander occur 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 Jefferson salamander has not been documented within the project area. Implementation of Forest Plan standards and guidelines is expected to protect suitable riparian habitat. The eastern box turtle typically uses forested riparian habitat. This species occurs 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). Due to a documented sighting, the project area is considered occupied habitat for the eastern box turtle; the Forest Plan guideline (USDA-FS, 2007a p. 87) will be implemented to protect the box turtle's home range and habitat integrity.

Coal skink

This species typically occupies dry oak forest habitat, but could occur in other dry mature hardwoods sites containing small inclusions of surface rock and rubble. In general, the project area contains a substantial amount of surface boulders, rocks, and/or rubble, and these habitat features are found in several of the proposed treatment areas. This species has not been documented in the project area but unique features such as rock outcrops and/or boulder fields are avoided and protected from disturbance through the implementation of Forest Plan standards and guidelines and design features. Also, there are additional standards and guidelines regarding the protection of this species and its habitat on page 87 of Forest Plan (USDA-FS 2007a p. 87).

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 1,554 acres (8 percent) of the project area in Alternative 1, on 1,268 acres (7 percent) in Alternative 3, and none 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. A slight increase in non-forested opening habitat from proposed stone pit expansion (up to four acres) and road construction (up to 3 acres) would result in Alternatives 1 and 3.

Although final harvests would produce a shift from mature mast-producing forest to early-structural habitat on a project-scale, this change is not considered substantial as an estimated 81 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 31 percent of these lands over the next 20 years. With anticipated OGD, less than 1 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. Nine perennial streams within the project area have been documented to contain brook trout. Wyncoop Run and the streams within the Millstone Creek basin are classified as High Quality Cold Water Fisheries by the Pennsylvania Department of Environmental Protection, however, there are 12 miles of streams in the headwaters of East Branch Millstone Creek subwatershed, that are listed as impaired from meeting Commonwealth water quality standards (PA DEP 2010). These streams do not attain protected water uses due to pH from “Natural Sources” and include the East Branch of Millstone Creek, Gurgling Run, and Steck Run, as well as tributaries to these streams. In March, 2012, Gregg Run was proposed for consideration to receive a “Wild Trout” designation by the Pennsylvania Fish and Boat Commission. This classification could invoke regulations which prohibit any new stream crossings from being constructed during a certain period of the year in order to protect native trout, and secondly, any wetland that is in the same drainage would be considered Exceptional Value, which comes with an increased level of protection for these wetlands and is more scrutinized by the state during any kind of permitting (B. Pence, personal communication). With the exception of Millstone Creek and its West and East branches, the streams within the project area are relatively small in size and are heavily forested. Similar to other 1st and 2nd order headwater streams on the Allegheny plateau; these streams have a naturally low pH and poor buffering capability due the area’s iron-based sandstone geology. Over the long-term, road maintenance, surface armoring, and large wood introductions 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.

Regardless of the selected alternative, streams and the aquatic life they support in the project area are maintained and protected from adverse effects of proposed management activities by the implementation of Forest Plan standards and guidelines (USDA-FS 2007a, pp. 74–79). Three of the four streams proposed for large woody debris introductions also contain native brook trout populations; therefore the treatments will benefit this species by creating different types of stream habitat and stabilizing the banks of these streams. Over the long-term, road maintenance, including limestone application on 9.2 miles of road surface, is expected to have a beneficial effect on water quality especially at point-sources of sedimentation such as road/stream crossings. Alternative 2 (no action) would have no effect on this species, except that the benefits of road limestone application would not be realized under this alternative.

Table 18–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
Indiana bat	May affect, but not likely to adversely affect	No adverse effect	May affect, but not likely to adversely affect
Northeastern bulrush	No adverse effect	No adverse effect	No adverse effect
Small whorled pogonia	No adverse effect	No adverse effect	No adverse effect
Clubshell mussel	No adverse effect	No adverse effect	No adverse effect
Northern riffleshell mussel	No adverse effect	No adverse effect	No adverse effect
Rayed-bean mussel	No adverse effect	No adverse effect	No adverse effect
Sheepnose mussel	No adverse effect	No adverse effect	No adverse effect
Snuffbox mussel	No adverse effect	No adverse effect	No adverse 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
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	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
Band-winged meadowhawk	No impact	No impact	No impact
Bartram shadbush	No impact	No impact	No impact

Regional Forester's sensitive species	Alternative 1– Proposed Action	Alternative 2– No Action	Alternative 3
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
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

Regional Forester's sensitive species	Alternative 1– Proposed Action	Alternative 2– No Action	Alternative 3
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
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 bat	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

Regional Forester's sensitive species	Alternative 1- Proposed Action	Alternative 2- No Action	Alternative 3
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
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-tipped emerald	No impact	No impact	No impact
Spotted darter	No impact	No impact	No impact
Stalked bulrush	No impact	No impact	No impact

Regional Forester's sensitive species	Alternative 1- Proposed Action	Alternative 2- No Action	Alternative 3
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 currant	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
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

Proposed Regional Forester's sensitive species	Alternative 1– Proposed Action	Alternative 2– No Action	Alternative 3
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	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
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 in the Millsteck project area found 22 ANF NNIP species of concern infesting a total of approximately 11 acres 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 (8 acres). Infestations of single or a small number of plants also occur along road corridors (3 acres). 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 59 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 70 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). 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 381 acres classified as open (1.9 percent) and 360 acres of road corridor (1.8 percent) for a total of 741 acres (3.8 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 64 acres would still occur of which 28 acres may receive herbicide treatments and if NNIP species are present in these areas they may 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 1,736 acres (9.1 percent) of the project area would be zero to 20 years in age under Alternative 1 and 1,431 acres (7.5 percent) under Alternative 3, respectively. However, as 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 1,554 acres (8 percent) under Alternative 1 and 1,268 acres (7 percent) under Alternative 3 by 2032. An additional 0.7 miles (3 acres) of road construction-new corridor under Alternative 1, and 0.3 miles (1.3 acres) under Alternative 3, would slightly increase non-forested land within the project area.

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 44 to 70 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 (26,251 acres) and includes the stone pit located on FR184. 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 stone pit expansion. Approximately 1,736 acres (9 percent) of regeneration final harvests and 0.7 miles 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 residential development and private OGD activities that convert forest to non-forest.

Four acres of pit expansion is proposed under both action alternatives and would be implemented within one pit which is located outside of the project area on FR184. This expansion would convert four 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 7,116 acres of privately owned land is located within the project boundary. Based on an analysis of aerial photographs, approximately 800 acres can be categorized as opening/residential, 136 acres (32 miles) occur as roads, and 30 acres are currently zero to 20 years old. Based on Forest Plan projections for private, non-industrial land, approximately 2,879 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, 8 shallow wells and 20 deep wells could be

constructed over the next twenty years. These wells would result in the conversion of approximately 210 acres into non-forested permanent openings. The pipeline expansion from Gregg Hill to the Clarion River will create approximately 17 acres of non-forested openings under any alternative.

At the present time, approximately 1,677 acres (6.4 percent) within the project area are categorized as non-forest. Non-forested lands are projected to occur on 7.3 percent of the project area under any alternative as 1,911 acres under Alternative 1, 1,909 acres under Alternative 3, and 1,904 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

One-hundred eleven (111) historic and/or prehistoric sites have been identified within or near the project area. Of the 111, one historic site has been nominated for listing on the National Register of Historic Places (NRHP). None of the remaining sites have been evaluated for nomination to the NRHP. Until evaluated, cultural resources are managed as though they have been determined eligible. At this time, all cultural resources in 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 under any alternative. Heritage resources will be avoided through project design or the use of no-treatment buffers. Where avoidance is not possible, protective measures will be implemented to ensure no effect to cultural resources. 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 National Register, are afforded protection with no-treatment buffers or the proposed activities have been designed to avoid affecting them.

Cultural resources and sites will 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 ROS settings with the following acreages; roaded natural (18,942 acres) and rural (120 acres). The desired ROS classification for the project area is roaded natural, while the area contained in the Loleta Recreation Area has a desired ROS of rural.

Scenic resources are measured based on two indicators: the degree of change to the existing landscape character and the ability to meet or exceed the Forest Plan Scenic Integrity Level (SIL) objectives 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, Gas, and Minerals (OGD), 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 forest in terms of minimally acceptable levels with the intent to achieve the highest integrity possible.

The SIL objectives within the Millsteck 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 within the project area. One section is located at the north end of the project area along the Loleta Grade Road (FR131). The other section is located at the southern end of the project area along the River Road (T301). Other travel ways with a secondary concern for scenery generally have a moderate to low SIL.

Table 19—Existing recreation activities and use patterns in the project area

Recreation Activity	Use Patterns
Developed Recreation	Loleta Recreation Area.
Pedestrian Trails	Loleta Trail.
Motorized Trails	FR 130 – 0.25 miles Allegheny Snowmobile Loop (ASL) Connector 15 FR 131 – 2.9 miles ASL Connector 6
Dispersed Camping	Several heavily used campsites along FR 131 are associated primarily with old camps that the FS purchased in the late 1920's, although there are others located in gravel pits, OGD sites, and old log landings. Campsites on FR 130 are associated with log landings. Campsites along the lower part of Millstone Creek (FR 143) have been rehabilitated and designated in the Clarion River Phase 1 – Phase 4 projects. Millstone Creek provides easy access to water for camp use and play. Sites along all Forest Roads are easy to access. Dispersed campsites associated with old camps are generally resilient. Vegetation is typically grass found in yards throughout much of the area, and some non-native plants such as plantain. Access to these sites is on the old driveway of the camp, which now need some surfacing or grading. Campsites on log landings and stone pits show little impact except for trash left behind. The sites in the stone pit also show signs of needing grading and surfacing on the access roads. The campsites associated with historic OGD activity often have exposed pipelines, and one has an access road that has deep water-collecting holes that show an oily sheen. The designated campsites along FR 143 are highly popular with adequate parking if used as intended.
Hunting and Fishing	<p>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: FR 592 is open to high-clearance vehicles during the hunting season (late September to the middle of January).</p> <p>Fishing opportunities occur in Millstone Creek and some of its many tributaries (Gurgling Run, Muddy Fork, Lick Run, Log Run, Steck Run, Jakes Run, Sugarcamp Run, Winlack Run, Coalbank Run, and Gregg Run), as well as tributaries of the Clarion River (Hoffman Run, Wyncoop Run, Cline Run, Clyde Run, Church Run, and Painter Run). Stocked trout streams are heavily utilized during the first few weeks of trout season.</p>
Unroaded Areas	There are four unroaded areas greater than 500 acres: Steck Run (1,807 acres), Gurgling Run (1,144 acres), Muddy Fork (875 acres), Gregg Hill (864 acres), and West Branch of Millstone (601 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 at the north end of the project area along the Loleta Grade Road (FR131). The other section is located at the southern end of the project area along the River Road (T301).
Unique Features and Special Events	There are no identified unique features or special events 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 the 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) resulting in a decrease in roaded natural under all alternatives. Rural ROS would not decrease – current acres of rural ROS are associated with Loleta Recreation Area – however acres could increase if modification from OGD accrued to the point where the standards of a roaded natural ROS could no longer be met in areas outside Loleta Recreation Area.

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 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 impact 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 impact 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 will be applied to areas of greatest impact 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 2009) and the National Forest Landscape Management Volume 2, Chapter 5, Timber. With the application of appropriate design features, impacts from harvest treatments as seen from Concern Level 1 (CL1) and Concern Level 2 (CL2) corridors will meet or exceed the Forest Plan SIL objectives. (USDA-FS 2007a, pp. 62-64)

Alternative 2 (No Action)

In Alternative 2, since no proposed timber harvest or reforestation activities would take place, there would be no change 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 the oil and gas development in the Millsteck project area 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 3

If Alternative 3 was implemented, as in Alternative 1, the proposed vegetation management

would have the potential to affect the character of the natural appearing forest vegetation. The difference is twenty-five fewer stands would be harvested. As with Alternative 1, the application of appropriate design features on page 19 will reduce impacts from harvest treatments as seen from CL1 and CL2 corridors and the scenery will meet or exceed the Forest Plan SILs.

Cumulative Effects

This project proposal is located in the South Central portion of the Marienville Ranger District containing the East Branch of Millstone Creek, Millstone Creek and Steck Run watersheds. The scenery cumulative effects analysis area encompasses 19,135 acres of NFS land and 7116 acres of private land. This area captures the extent of the view shed 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 NEPA 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.

The number of new oil and gas 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 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 management activities would maintain the existing landscape character type and would meet or exceed the established SIL's 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

For Alternative 2, there would be few direct effects to existing recreation activities or their use patterns (see Table 19) in the project area. Campsites with access roads that did not receive grading or surfacing could fall out of use if recreationists are unable to get vehicles or equipment to the usual camping area. None of these proposed areas provide a large enough place along FR 131 to provide for an alternative place to set up camp, so the site would essential disappear over time as use decreased and vegetation encroached. This would result in an eventual loss of camping areas unless users created new campsites. The number of campsites has not increased since the original inventory was taken in 2007, suggesting that either the need for additional sites does not exist or, more probably, that additional attractive camping sites do not exist in the area.

The latter is assumed to be the case because additional sites do occasionally occur along Millstone Road (FR 143) despite a Forest Order that camping is to occur only in designated sites. Sites with exposed pipelines would continue to be used, which could be detrimental to the integrity of active pipelines and could provide a safety risk to campers. 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 and dispersed camping. 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, which are where dispersed campsites are located. Particularly affected would be use of FR 130 and FR 131 as these roads would be used for timber hauling and, if harvest occurs during the winter snowmobiling season (generally from November to April). Individual dispersed campsites may be unavailable while timber harvesting and reforestation treatments are occurring and for a short time period afterward (1 to 3 years) until vegetation is re-established. New camping sites 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, even in inclement weather. Grading and surfacing some sites would make them easier to access for camping purposes while protecting soil and water values on or near the campsites. Closing sites with exposed pipelines protects recreationists from a potential safety hazard from contaminated soil or oil/gas leaking from the pipeline near a campfire, and protects the pipeline from the impacts of recreation use, such as compacted soils continuing to expose more pipe, or the chance of damage to the pipeline causing leaks. If the pipeline or associated structures are of historic value, closing the site protects that history from casual damage. Under Alternative 1, proposed road construction of FR 774B would encroach upon the Gurgling Run unroaded area (see Map 3), decreasing it by 148 acres. This would decrease the potential for solitude by allowing easier access for more people and creating more noise. Even so, it would remain the second-largest unroaded area in the Millsteck Project. Under Alternatives 2 and 3, the size and shape of the two unroaded areas would not change from the existing condition; however, potential future OGD may change the size and shape of these unroaded areas. 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 rural 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 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, Forest, Warren, and McKean counties for support of roads and schools. 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 Elk 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 21,400 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 returned receipts to Elk County and 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 also result from the proposed activities that would enhance wildlife habitat supporting hunting, wildlife viewing, and berry picking. As shown in Table 20, total costs include timber sale layout, timber marking, contract administration, and reforestation treatments proposed. 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. The bulk of the costs associated with these treatments include site preparation, herbicide application, release, and fencing. The costs and returns in Table 20 do not include approved activities from past projects that have not been implemented yet.

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 ANF 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 Bureau 2011). 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 20—Cost and returns from Alternatives 1, 2 and 3

Treatment Costs and Returns	Alternative 1 (Proposed Action)	Alternative 2 (No Action)	Alternative 3
Total Costs Timber sale preparation and administration, reforestation costs, road work, wildlife habitat improvements, and project planning and implementation	\$13,866,866.00	\$804,000.00	\$10,020,658.00
Total Returns Revenues generated from timber harvests on NFS land	\$7,345,800.00	\$0	\$4,943,400.00
Net Cash Flow Total Return - Total Cost	(-) \$6,651,066.00	(-) \$804,000.00	(-) \$5,077,258.00

Cumulative Effects

For Alternative 2, previously approved activities, timber harvesting activities on private lands, and future Forest Service 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 Elk 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 and 3 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 20 is based upon the 5-year average (2007–2011) awarded timber values 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 Alternatives 1 and 3 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 in the 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. Herbicide application would not occur within 150 feet of any private residence. Herbicides would be applied following Forest Plan standards and guidelines to minimize the risk of accidental exposure. This would include warning signs, maximum wind caps (10 mph), directional spraying (near property lines and trails), landowner notification, timing, and buffers to minimize accidental contact or exposure. 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 shift 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 that is completed. Further information regarding prescribed burning 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 and 3) and smoke emissions from prescribed burning (Alternatives 1 and 3). Under all alternatives, no herbicide application would occur within 150 feet of a private residence or known water source.

For all alternatives, overall risks from the planned (up to 3192 acres) and previously approved (28 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 and insecticides) 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 from 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 forest types would be of short duration. Smoke management through dispersion would be addressed in the burning parameters of the burn plan. Emissions from prescribed burning would not exceed federal air quality standards. The Forest Service 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 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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