

Chapter 2 - Alternatives

This chapter:

- explains how the public was informed of the Hogback proposal, and opportunities for public input;
- summarizes the issues that were identified as a result of public involvement;
- describes the alternatives that were considered to address issues and concerns;
- provides maps of the alternatives considered in detail;
- identifies the design features and mitigation measures that would be implemented to reduce the chance of adverse resource effects; and
- summarizes the effects of the alternatives in comparative form to clearly display the differences between each alternative and to provide a clear basis for choice among options by the decision maker and the public.

2.1 Public Involvement

Scoping is the process of gathering comments about a site-specific proposed federal action to determine the scope of issues to be addressed and for identifying any unresolved issues that are related to the proposed action (40 CFR 1501.7).

Public input on proposed Hogback activities was solicited from the general public, Forest Service employees, other public agencies, adjacent property owners, and organizations. Public involvement was sought through various means:

- 1) On July 1, 2006, the Hogback proposal was listed in the Monongahela Schedule of Proposed Actions (SOPA), a publication that is mailed to over 140 individuals and organizations and is posted on the Monongahela National Forest's website. The project has been listed in each subsequent issue of the SOPA.
- 2) On January 25, 2007, the scoping letter requesting input was sent to approximately 250 interested parties and landowners. This scoping letter summarized the purpose and need for action, the proposed action, and described various ways to get additional information and how to provide input.
- 3) On January 25, 2007, a legal notice was published in the *Parsons Advocate* requesting input. This legal notice gave a short summary of the purpose and need and proposed action, and described how to get additional information and how to provide input.
- 4) The proposal and request for input were posted for review on the Monongahela National Forest's website at www.fs.fed.us/r9/mnf/ under "Forest Planning".

Approximately 25 individuals and organizations have contacted us about the Hogback proposal in the form of letters, e-mails, or phone calls since the scoping process began in July, 2006 (project record). Comments were used to define issues, develop alternatives, or identify environmental effects.

The official 30-day Notice and Comment period will begin with the publication of a legal notice in the *Parsons Advocate* newspaper. That notice will announce the availability of the draft Hogback Environmental Assessment (EA) and will request comments and input. After the Deciding Official and Interdisciplinary Team (IDT) review comments and input, the EA will be finalized and a Decision Notice (DN) and Finding of No Significant Impact (FONSI) will be written and signed, documenting the decision of the Deciding Official.

2.2 Issues

The purpose of soliciting comments is to determine whether significant issues exist that affect the proposed action. An issue is a point of discussion, debate, or dispute (often about environmental effects). Not all issues are significant issues. Issues may be deemed significant because of the extent of their geographic distribution, the duration of their effects, or the intensity of interest or resource conflict. They are used to formulate alternatives, prescribe mitigation measures, or analyze environmental effects. They are also used to determine the scope (49 CFR 1508.25) of the environmental analysis.

The Interdisciplinary Team (IDT) reviewed information received from individuals, adjacent landowners, organizations, and other agencies. The disposition of the comments that were received during the initial scoping period is documented in the project record. Two issues that were deemed to be significant are described in the following sections.

2.2.1 Issue 1: Soil Erosion and Stream Sedimentation

Conventional logging operations generally involve the development and use of new or existing roads, skid trails and skid roads (un-surfaced routes used to remove trees from harvest units), and log landings (openings used to store harvested trees until they can be hauled from the project area). Using heavy equipment on these roads, trails, and log landings can lead to soil erosion and stream sedimentation. The extent of soil erosion and stream sediment effects is influenced by several factors: 1) the amount and intensity of earth disturbance; 2) the type of soil impacted (e.g., wet soils are more vulnerable to erosion than other soil types in the project area; they contain high water tables that could be exposed during construction of skid trails, skid roads, log landings, and roads); and 3) the slope on which activities occur (e.g., bare soils on slopes more than 30 percent are generally at greater risk for soil erosion and runoff than those on lesser slopes).

- The Proposed Action would: 1) develop openings for harvest units, landings, and wildlife openings; 2) develop and rehabilitate skid trails and skid roads; and 3) construct, reconstruct, maintain, and/or decommission roads in the project area. These activities may expose soils, cause soil puddling and rutting, and alter surface and subsurface water flows. Such effects could result in sediment being carried in runoff to nearby streams. If sediment loads increase in streams that already have high sediment levels, sediment embedded in trout spawning gravels could reduce reproductive success and adversely affect native trout populations.

The following **units of measure** are used in this EA to evaluate this issue:

- Acres of new soil exposed (acres disturbed by the development of log landings/wildlife openings; skid trails and skid roads; and road activities such as construction and decommissioning)
- Percent of Hogback project area affected by ground disturbance, such as log landings/wildlife openings, skid trails/roads, and road activities such as construction and decommissioning

2.2.2 Issue 2: Herbicide Use

Herbicide use in the area is needed to control ferns, grasses, striped maple, beech, and non-native invasive species to establish desirable species such as black cherry and other mast-producing species. The herbicides used may affect both target and non-targeted plants. The extent of this depends on the types of herbicides used, the amounts of herbicides used, the timing of herbicide applications, and the methods used to apply the herbicides. Herbicides also have the potential to move off-site and possibly adversely impact terrestrial and aquatic plants, animals, and water quality. Exposure to herbicides has the potential to adversely affect human health and safety, particularly the workers applying the herbicides and any members of the public that come in contact with treated vegetation.

- The Proposed Action would apply four herbicides within proposed harvest units: triclopyr; glyphosate; imazapyr; and sulfometuron-methyl. One of these herbicides – triclopyr – would be used for non-commercial timber stand improvement (TSI). These herbicides would be applied to reduce the number of striped maple, beech, ferns, sedges, and grasses so that shade-intolerant tree species can compete and regenerate successfully. Applying these herbicides has the potential to affect terrestrial and aquatic plants, animals, water quality, and human health and safety.
- The Proposed Action would apply three herbicides to treat non-native invasive species (NNIS): glyphosate; imazapic; and triclopyr. They would be applied to reduce the number and spread of garlic mustard, Japanese stiltgrass, and tree of heaven, in and near harvest units, skid trails, skid roads, landings, and road construction, reconstruction, maintenance, and decommissioning areas where the disturbance associated with these activities could spread these and other NNIS species. The spread of these species has the potential to cause ecosystem degradation. Applying these herbicides has the potential to affect terrestrial and aquatic plants, animals, water quality, and human health and safety.

The following **units of measure** are used in this EA to evaluate this issue:

- Acres of foliar application method (used for ferns and some release after harvest for white pine)
- Acres of application using basal spray, cut surface, and/or cut stump method
- Pounds of active ingredient applied per acre by method

2.3 Alternatives Considered but Eliminated from Detailed Study

During initial planning and scoping, several alternatives to the Proposed Action were suggested and considered. The following is a summary of the alternatives that were considered, but, for the reasons noted here, were eliminated from detailed study.

2.3.1 Uneven-aged Management

An alternative that would have used only uneven-aged management such as single-tree selection or diameter-limit harvesting was considered, but dismissed from detailed analysis. Uneven-aged management would not move the project area towards the desired age class diversity. Uneven-aged management would create a mosaic of age classes within individual stands, but it would not move towards a mosaic of tree stands of various height, shape, and age across the project area (Forest Plan, p. III-4).

Uneven-aged management, over the long term, would favor shade-tolerant species, changing the overstory species diversity from what it is now. Given this project area's ecological setting, such an alternative would not create the growing conditions needed to allow shade-intolerant mast-producing tree species to flourish. Shade-intolerant mast-producing species currently in the overstory would not be able to compete with shade-tolerant beech and maple that are growing in the understory. Uneven-aged management would regenerate mast-producing beech, but due to the wide-spread existence of beech bark disease, beech could not be relied on to provide a long-term supply of mast for wildlife.

Also, deer browsing has adversely affected past regeneration in some stands within and near the Hogback project area. Regeneration under uneven-aged management is slower growing (because of low light levels) and subject to deer browsing for a longer time than regeneration under even-aged harvest.

2.3.2 Manage Vegetation Without Logging

Alternatives were considered that would accomplish vegetative objectives using methods other than logging.

For example, an alternative was considered which would use only herbicide to meet project objectives. This alternative would not have harvested timber or constructed or reconstructed roads. Herbicide would kill enough trees to: 1) help improve the age class distribution of the area and create adequate growing conditions so mast-producing tree species could regenerate; 2) release overstocked stands from vegetative competition so mast-producing tree species would thrive within existing stands; and 3) create additional openings. However, this alternative was dismissed from further consideration because: 1) it would not meet the need to provide forest products; 2) the costs of using herbicides in the quantities necessary to help meet the desired habitat conditions would be extremely high; and 3) the potential to have undesirable impacts to aquatic and terrestrial systems would be greater.

Prescribed fire, instead of timber harvesting, was also considered to meet vegetative objectives. In the appropriate ecological setting, prescribed fire can produce some of the same beneficial effects as timber harvesting and herbicide use. However, in this project area, it would be especially labor intensive and costly. This project area is at a fairly high elevation. It tends to receive a lot of precipitation and has wetter sites than some areas of the Forest. The mixes of tree species that currently exist in the project area aren't likely to respond well to a low-intensity fire. To implement a low-intensity fire, trees would have to be killed before the fire - by cutting them or using herbicide - to provide enough fuel to generate the burn intensity needed to regenerate mast-producing tree species. Using a high-intensity fire would not be advantageous because it would likely kill desirable overstory trees like cherry (02/23/2005 Fischer prescribed fire information and 02/25/2005 Thomas Van Gundy information in project record). Therefore,

using prescribed fire in this particular area is not likely to meet the desired habitat conditions, and it, too, would not meet the need to provide forest products.

2.3.3 Manage Vegetation Without Using Herbicides

An alternative was considered to move this area towards desired future vegetative condition without using herbicides. It would have implemented all the same activities as the Proposed Action, except that no herbicides would have been applied.

Mechanical methods of controlling interfering vegetation would not give satisfactory control due to vigorous sprouting after cutting. This sprouting would lead to increased competition and a lower proportion of shade-intolerant species in future stands.

Prescribed fire was also considered as an alternative to using herbicides. This area of the forest receives over 50 inches of precipitation a year, making a majority of the units in the Hogback area too wet to effectively use prescribed burning. The steep topography and the fragmented nature of National Forest System land with private land in the project area would also make prescribed fire very difficult.

2.3.4 Manage Vegetation Using Logging Plans That Require Access Onto Private Lands

An alternative was considered using landings and roads on private property. This alternative would have required the use, and possibly construction, of helicopter landings and access roads on private property adjacent to or near the harvest units. Agreements would have had to have been made between individual landowners and either the Forest Service or the purchaser(s) of the sale(s). This alternative would have harvested the same areas and acres as the Proposed Action.

This alternative was eliminated from detailed study because of the difficulties in setting up agreements with private landowners for harvest operations. For some units, more than one landowner has land that might work for landings and access roads. The Monongahela NF did not want to be put in the position of appearing to favor one landowner over another. The elimination of this alternative does not preclude the purchasers of the timber from making their own agreements to use private land.

Because of the potential for timber purchasers to make agreements with private landowners for access, elements of this alternative were included in the action alternatives to ensure that potential effects associated with alternative access and landings are disclosed. Toward this end, several proposed helicopter units were also analyzed as cable or conventional units based on the possibility of obtaining access across private land.

2.4 Alternatives Given Detailed Study

The following section describes the three alternatives that were studied in detail: Alternative 1 (No Action); Alternative 2 (Proposed Action); and Alternative 3. Acres or miles identified for activities have been identified from mapping and should be considered estimates.

2.4.1 Alternative 1. No Action

The National Environmental Policy Act (NEPA) requires an EA to include a “No Action” alternative to serve as a baseline to compare action alternatives. This alternative provides the decision-maker with a clearer basis for a reasoned choice among the alternatives studied in detail. It responds to people who do not want timber management to occur on National Forest System (NFS) lands and only want nature to influence change in the project area. Figure 2.1 Alternative 1 – No Action is a map that shows some detail in the Hogback project area that is not shown in the other alternative maps to keep them from becoming too cluttered. This 11” x 17” map is located at the end of Chapter 2 for paper EAs, or as a separate file for electronic versions of the EA.

Under this alternative, additional new management activities would not be implemented to help meet the purpose and need for action described in Chapter 1. Trees would not be harvested. Commercial forest products would not be offered. The existing transportation system would not be changed.

This alternative is essentially the “status quo” strategy. It allows current management activities and policies to continue. For example, the following activities would continue to be implemented in the project area: routine mowing of wildlife openings; routine road maintenance activities (e.g., grading and shaping the road prism, cleaning ditch lines and culverts); routine trail maintenance (e.g., clearing brush, blazing, re-establishing adequate drainage), and routine maintenance of existing gas facilities within the project area.

Existing road use policies would remain in affect. Existing dispersed recreational sites, trails, trailheads, and parking areas would continue to be used. Recreational activities (e.g. hunting, camping, sight-seeing, hiking, fishing, mountain biking) and the gathering of miscellaneous forest products (e.g., firewood, moss, ginseng) would continue.

The No Action Alternative is based on the premise that ecosystems change, even in the absence of active management. Natural events (e.g., wildfires, ice, wind, insects, disease, natural succession) may occur that would: help balance the age class distribution of the area; perpetuate mast-producing tree species; release overstocked stands from vegetative competition; and create grassy habitat. The extent and timing of such events can not be predicted.

2.4.2 Action Alternatives 2 and 3

This section (Section 2.4.2) describes both action alternatives: Alternative 2 and Alternative 3. The following narratives and tables describe both the similarities and differences between these two alternatives.

Alternative 2 is the Proposed Action that was presented to the public during the scoping period. This alternative was developed to meet the purpose and needs for action described in Chapter 1. As noted in Chapter 1, activities are proposed only on National Forest System (NFS) land in Management Prescription (MP) 3.0 areas. No activities would be implemented on private land without permission of the landowner or on NFS lands in other areas.

Alternative 3 was developed in response to both internal and external concerns, primarily regarding soil erosion and sedimentation in the Hogback project area. The criteria for determining which units were at higher risk for soil and sedimentation effects due to conventional logging systems, existing system roads, and landing sites are listed below:

- steep slopes,
- roading and long-term soil productivity loss,
- long and short-term effects of compaction on wet soils,
- seasonal logging restrictions,
- herbicide applications,
- landing locations, and
- logging system layout.

Alternative 3 utilized the surveys and analyses already done for the units in the Proposed Action. Units were either dropped from the harvest plan or the harvest system was changed to one that would create less soil disturbance. Some units were changed for access reasons not directly related to soil and water concerns.

Most of the activities included in each action alternative are shown on maps. These 11” x 17” paper maps are located at the end of Chapter 2 for hard copy EAs, or as separate “.pdf” files for electronic versions of the EA.

Alternative 2 activities are shown on these maps:

- Figure 2.2. Alternative 2 – Proposed Action; and
- Figure 2.4. Timber Stand Improvement for Alternatives 2 and 3.

Alternative 3 activities are shown on these maps:

- Figure 2.3. Alternative 3, and
- Figure 2.4. Timber Stand Improvement for Alternatives 2 and 3.

2.4.2.1 Commercial Timber Harvests – Harvest Prescriptions, Logging Methods, and Herbicide Treatments

Five commercial harvest prescriptions and four logging methods are proposed, along with pre-harvest and post-harvest herbicide treatments. The following narratives and tables describe these proposed activities.

Description of Harvest Prescriptions

Table 2.1. Summary of harvest prescriptions, by alternative, in acres

Harvest Prescription	Alternative 1 – No Action	Alternative 2 - Proposed Action	Alternative 3
Clearcut with reserves (cove hardwood or mixed oak)	0	1,187	1,077
Clearcut with reserves (oak-pine)	0	69	40
Shelterwood	0	88	66
Overstory removal	0	63	60
Commercial thinning	0	53	53
Total	0	1,460	1,296

Clearcut with reserves (cove hardwood or mixed oak)

Objective: Regenerate cove hardwood or mixed oak stands back to stands that are similar in species composition to the present stand.

All trees 1.0 inch in diameter and greater would be felled. Reserve clumps would be left. Stands would be naturally regenerated. Herbicides would be used in selected units to control interfering vegetation prior to harvest. Pulpwood would be left on site to inhibit deer browsing. Black walnut would be planted in selected units, approximately 20 walnut seedlings per unit. Herbicides would be used the 1st and 3rd years after planting for herbaceous weed control.

Clearcut with reserves (cove hardwood or mixed oak) for Alternative 3 would be the same as for Alternative 2 – except that 110 fewer acres would be treated.

Clearcut with reserves (oak-pine)

Objective: Regenerate the stands back to a mixed oak-pine stand.

White pine occurred naturally on several tributaries of the Cheat River, including Horseshoe Run (Brooks 1911). The first large steam-powered sawmill was located in 1874 at the mouth of Wolf Run to saw white pine. Prior to the coming of the railroads to this area, between 1874 and 1880, millions of board feet of white pine lumber and shingles were rafted down the Cheat River to Rowlesburg (Maxwell 1884). Historical evidence indicates that fire, agriculture clearing, and extensive harvesting have greatly reduced the original range of white pine in the Cheat River watershed. The proposed Hogback timber sale provides an opportunity to restore white pine to some of its former range by planting a white pine component in selected harvest units in this sale.

All trees 1.0 inch in diameter and greater would be felled. Reserve clumps would be left. Stands would be regenerated through natural regeneration and planting. Any white pine present in the stand would be retained. White pine would also be planted in order to increase the pine component in the stands. Approximately 200 white pines would be planted per acre. Seedlings would be treated with deer repellent the 1st and 2nd years after planting. Bud caps would be used after that to protect the seedlings from deer browsing until the seedlings are approximately 5 feet tall. Herbicides would be used the 1st and 3rd years after planting to release the pine. Fencing may be required to prevent excessive deer browsing of desirable regeneration in Unit 705.

Clearcut w/reserves (oak-pine) for Alternative 3 would be the same as for Alternative 2 – except that 29 fewer acres would be treated.

Shelterwood

Objective: Regenerate the present mixed oak or Allegheny hardwood stands back to stands that are similar in species composition to the present stand.

The first harvest would reduce the relative density of the stand to approximately 80 percent. Well-formed, healthy red oak, white oak, and black cherry would be left as seed trees. After adequate regeneration is established (3 to 5 years), the remaining overstory would be removed. Herbicides would be applied to the units prior to harvest to control ferns, beech,

and striped maple. Fencing may be required to prevent excessive deer browsing of desirable regeneration.

Shelterwood for Alternative 3 would be the same as for Alternative 2 – except that 22 fewer acres would be treated.

Overstory removal

Objective: Increase the growth and vigor of sapling sized shade-intolerant species.

In two-age cuts harvested 5 to 15 years ago, the residual stems or leave trees left after the previous harvest would be cut. This would be done to prevent the leave trees from adversely affecting the newly established stand. Depending on the commercial viability or merchantability of the leave trees in each unit, some of the units might be sold, with the trees being removed, while in other units, the felled trees might be left on site.

Overstory removal for Alternative 3 would be the same as for Alternative 2 – except that 3 fewer acres would be treated.

Commercial thinning

Objective: Increase the growth and vigor of sawtimber-sized stands by reducing the stand density.

In over-stocked sawtimber-sized stands, approximately one-third of the trees would be removed to increase growing space for the remaining trees. Reducing the stocking would increase the growth and vigor of the remaining trees by increasing the light, water, and nutrients available to them.

Commercial thinning for Alternative 3 would be the same as for Alternative 2.

Description of Logging Methods

Table 2.2. Summary of logging methods, by alternative, in acres

Logging Method	Alternative 1 - No Action	Alternative 2 - Proposed Action	Alternative 3
Conventional	0	554	280
Conventional/Cable	0	316	324
Helicopter	0	473	692
Helicopter/Cable	0	117	0
Total	0	1,460	1,296

Conventional Logging

Conventional logging refers to the typical logging system used in West Virginia. A conventional logging system involves building roads throughout an area to access the timber. The logs are dragged behind a rubber-tired skidder from the stump to the landing. At the log landing, the logs are processed and loaded onto trucks.

Cable Logging

Cable logging is a logging system where logs are taken from the stump to a landing by dragging the logs uphill. A machine with several large winches does this by using an overhead system of cables to suspend one end of the log.

Helicopter Logging

Helicopter logging involves using a helicopter to take the logs from the stump to a log landing. The logs are attached to a cable suspended below the helicopter. The helicopter flies the logs to a landing and puts them down. The logs are then processed and loaded onto trucks and sent to a sawmill.

In certain, selected units, the purchaser would be given the option to helicopter or cable log the unit.

Table 2.3. Details of harvest prescriptions and logging methods, by unit, by alternative, in acres

Stand ID	Alt 2 Acres	Alt 2 Harvest Prescription	Alt 2 Logging Method	Alt 3 Acres	Alt 3 Harvest Prescription	Alt 3 Logging Method
201	35.6	Clearcut w/res	Helicopter/Cable	35.6	Clearcut w/res	Helicopter
202	36.7	Clearcut w/res	Helicopter	36.7	Clearcut w/res	Helicopter
203	32.1	Clearcut w/res	Helicopter	32.1	Clearcut w/res	Helicopter
206	40.4	Clearcut w/res	Helicopter	40.4	Clearcut w/res	Helicopter
301	37.2	Clearcut w/res	Conventional	37.2	Clearcut w/res	Conventional
302	24.3	Clearcut w/res	Helicopter/Cable	24.3	Clearcut w/res	Helicopter
303	37.9	Clearcut w/res	Helicopter			
304	40.1	Clearcut w/res	Conventional			
401	30.6	Clearcut w/res	Conventional/Cable	30.6	Clearcut w/res	Helicopter
402	26.8	Clearcut w/res	Helicopter	26.8	Clearcut w/res	Helicopter
404	39.8	Clearcut w/res	Helicopter	39.8	Clearcut w/res	Helicopter
501	38.7	Clearcut w/res	Helicopter/Cable	38.7	Clearcut w/res	Helicopter
502	18.8	Clearcut w/res	Helicopter/Cable	18.8	Clearcut w/res	Helicopter
503	37.9	Clearcut w/res	Helicopter	37.9	Clearcut w/res	Helicopter
504	25.6	Shelterwood	Conventional	25.6	Shelterwood	Conventional
506	39.6	Shelterwood	Conventional	39.6	Shelterwood	Conventional
508	7.2	Overstory Removal	Helicopter	7.2	Overstory Removal	Helicopter
601	33.8	Clearcut w/res	Conventional/Cable	33.8	Clearcut w/res	Conventional/Cable
602	25.6	Clearcut w/res	Conventional	25.6	Clearcut w/res	Conventional
603	24.3	Clearcut w/res-Pine	Conventional	24.3	Clearcut w/res-Pine	Conventional/Cable
604	27.3	Clearcut w/res	Conventional/Cable	23.4	Clearcut w/res	Conventional/Cable
605	27.5	Clearcut w/res	Conventional			
607	30.9	Clearcut w/res	Conventional	30.9	Clearcut w/res	Conventional/Cable
611	35.4	Clearcut w/res	Conventional/Cable	35.4	Clearcut w/res	Conventional/Cable
701	10.7	Clearcut w/res	Conventional	10.7	Clearcut w/res	Helicopter
702	23.5	Clearcut w/res	Conventional	23.5	Clearcut w/res	Helicopter
705	15.4	Clearcut w/res	Conventional	15.4	Clearcut w/res	Conventional

Stand ID	Alt 2 Acres	Alt 2 Harvest Prescription	Alt 2 Logging Method	Alt 3 Acres	Alt 3 Harvest Prescription	Alt 3 Logging Method
706	30.1	Clearcut w/res	Conventional/Cable	30.1	Clearcut w/res	Conventional/Cable
707	39.9	Clearcut w/res	Helicopter	39.9	Clearcut w/res	Helicopter
709	21.5	Shelterwood	Conventional			
1101	3.1	Thinning	Conventional	3.1	Thinning	Conventional
1201	38.9	Clearcut w/res	Helicopter	38.9	Clearcut w/res	Helicopter
1202	31.8	Clearcut w/res	Helicopter	31.8	Clearcut w/res	Helicopter
1203	22.8	Thinning	Conventional	22.8	Thinning	Conventional
1204	25.4	Clearcut w/res	Conventional/Cable	25.4	Clearcut w/res	Conventional/Cable
1205	27.0	Thinning	Conventional	27.0	Thinning	Conventional
1206	23.6	Clearcut w/res	Conventional/Cable	23.6	Clearcut w/res	Conventional/Cable
1208	22.3	Clearcut w/res	Helicopter	22.3	Clearcut w/res	Helicopter
1209	21.4	Overstory Removal	Conventional	18.2	Overstory Removal	Conventional
1302	20.8	Clearcut w/res	Helicopter	20.8	Clearcut w/res	Helicopter
1304	25.2	Clearcut w/res	Helicopter	25.2	Clearcut w/res	Helicopter
1307	13.0	Clearcut w/res	Conventional	13.0	Clearcut w/res	Conventional
1309	16.0	Clearcut w/res-Pine	Conventional			
1310	13.0	Clearcut w/res-Pine	Conventional			
1311	33.9	Clearcut w/res	Helicopter	33.9	Clearcut w/res	Helicopter
2102	16.1	Clearcut w/res-Pine	Conventional	16.1	Clearcut w/res-Pine	Conventional
2104	39.1	Clearcut w/res	Conventional/Cable	39.1	Clearcut w/res	Helicopter
2105	26.9	Clearcut w/res	Conventional	26.9	Clearcut w/res	Conventional/Cable
2106	21.3	Clearcut w/res	Conventional	21.3	Clearcut w/res-Pine	Conventional
2107	36.6	Clearcut w/res	Conventional/Cable	36.6	Clearcut w/res	Conventional/Cable
2108	16.8	Clearcut w/res	Conventional	16.8	Clearcut w/res	Helicopter
2109	34.1	Clearcut w/res	Conventional/Cable	34.1	Clearcut w/res	Conventional/Cable
2110	20.2	Overstory Removal	Conventional	20.2	Overstory Removal	Helicopter
2111	14.6	Overstory Removal	Conventional	14.6	Overstory Removal	Conventional
Total	1,460			1,296		

Description of Herbicide Treatments

The herbicides used in Alternatives 2 and 3 would be hand-applied. Tables 2.4, 2.5, and 2.6 explain which treatments or combination of treatments would be applied to the units. The methods used are explained below:

- **Cut-surface** – Herbicide(s) mixed with water would be applied directly to the inner bark of the targeted stem by first cutting incisions in the trees or in the freshly cut stump.
- **Basal Spray** – Herbicide(s) would be mixed with oil and applied to the lower 15 to 18 inches of targeted stems.

- **Foliar Spray** – Herbicide(s) would be mixed with water and sprayed on the foliage of targeted vegetation. The foliage of the sprayed plants would be wetted to the point of runoff and applied during the growing season.

Pre-Harvest Treatments

Table 2.4. Pre-harvest herbicide treatments for Alternatives 2 and 3

Application Type	Concentration	Volume per acre	Pounds per acre of Active Ingredient
Cut surface	4 oz. imazapyr (Arsenal AC or equivalent)	1.0 gallon	0.125 lbs imavapyr
Basal spray	12.8 oz. triclopyr (Garlon 4 or an equivalent)	5 gallons	2 lbs. triclopyr
Foliar spray	2 oz. sulfometuron-methyl (Oust or an equivalent) 2 qt. glyphosate (Glypho or an equivalent)	25 gallons	0.094 lbs sulfometuron-methyl 2.7 lbs. glyphosate

- **Cut surface** - Cut-surface treatment using 3 percent imazapyr would treat large woody interference (striped maple, birch, beech, etc.).
- **Foliar Spray** - A foliar spray would be applied to using glyphosate and sulfometuron-methyl to ferns and grasses.
- **Basal spray** - A basal spray of a 5 percent solution of triclopyr mixed with oil, would treat large woody interference (striped maple, birch, beech, etc.)

Post-Harvest Treatments

Table 2.5. Post-harvest herbicide treatments for Alternatives 2 and 3

Application Type	Concentration	Volume per acre	Pounds per acre of Active Ingredient
Cut surface	2 qt. glyphosate (Glypho or an equivalent)	1.0 gallon	2.7 lbs. glyphosate
Basal spray	12.8 oz. triclopyr (Garlon 4 or an equivalent)	5 gallons	2 lbs. triclopyr
Foliar spray	12 oz. imazapyr (Arsenal AC or an equivalent) 2 qt. glyphosate (Glypho or an equivalent)	25 gallons	0.375 lbs imazapyr 2.7 lbs. glyphosate

- **Cut surface** - Cut-surface treatment using 50 percent glyphosate would treat large woody interference (striped maple, birch, beech, etc.).
- **Foliar Spray** - A foliar spray would be applied to using glyphosate and sulfometuron-methyl to ferns and grasses.
- **Basal spray** - A basal spray of a 5 percent solution of triclopyr mixed with a light petroleum oil, would treat large woody interference (striped maple, birch, beech, etc.)

Table 2.6. Details of pre- and post-harvest herbicide treatments, by regeneration unit¹

Unit	Compartment	Alternative 2			Alternative 3		
		Acres ¹	Pre-Harvest Herbicide Treatment ²	Post-Harvest Herbicide Treatment ³	Acres	Pre-Harvest Herbicide Treatment ²	Post-Harvest Herbicide Treatment ³
201	2	36	Cut surface/basal spray	None	36	Cut surface/basal spray	None
202	2	37	Cut surface/basal spray	None	37	Cut surface/basal spray	None
203	2	32	Foliar Spray/basal spray	None	32	Foliar Spray/basal spray	None
206	2	40	Foliar Spray/Cut Surface	None	40	Foliar Spray/Cut Surface	None
301	3	37	Cut surface/basal spray	None	37	Cut surface/basal spray	None
302	3	24	Foliar Spray/Cut Surface	None	24	Foliar Spray/Cut Surface	None
303	3	38	Foliar Spray/Cut Surface	None	----	----	----
304	3	40	Foliar Spray/basal spray	Foliar	----	----	----
401	4	31	None	None	31	None	None
402	4	27	Foliar Spray/basal spray	None	27	Foliar Spray/basal spray	None
404	4	40	None	None	40	None	None
501	5	39	Foliar Spray/Cut Surface	None	39	Foliar Spray/Cut Surface	None
502	5	19	Foliar Spray/Cut Surface/basal spray	None	19	Foliar Spray/Cut Surface/basal spray	None
503	5	38	Foliar Spray/Cut Surface/basal spray	None	38	Foliar Spray/Cut Surface/basal spray	None
504	5	26	Foliar Spray/Cut Surface/basal spray	None	26	Foliar Spray/Cut Surface/basal spray	None
506	5	40	Foliar Spray/Cut Surface/basal spray	None	40	Foliar Spray/Cut Surface/basal spray	None
508	5	7	None	None	5	None	None
601	6	34	None	None	34	None	None
602	6	26	None	None	26	None	None

Unit	Compartment	Alternative 2			Alternative 3		
		Acres ¹	Pre-Harvest Herbicide Treatment ²	Post-Harvest Herbicide Treatment ³	Acres	Pre-Harvest Herbicide Treatment ²	Post-Harvest Herbicide Treatment ³
603	6	24	None	Foliar Spray/Cut Surface/basal spray	24	None	Foliar Spray/Cut Surface/basal spray
604	6	27	None	None	23	None	None
605	6	28	Cut surface/basal spray	None	----	----	----
607	6	31	Cut surface/basal spray	None	31	Cut surface/basal spray	None
611	6	35	None	Foliar Spray	35	None	Foliar Spray
701	7	11	Basal spray	None	11	Basal spray	None
702	7	24	None	Foliar Spray	24	None	Foliar Spray
705	7	15	Cut surface	None	15	Cut surface	None
706	7	30	Cut surface	None	30	Cut surface	None
707	7	40	Cut surface/basal spray	None	40	Cut surface/basal spray	None
709	7	22	Cut surface/basal spray	None	----	----	----
1201	12	39	Cut surface	None	39	Cut surface	None
1202	12	32	Foliar Spray/Cut Surface	None	32	Foliar Spray/Cut Surface	None
1204	12	25	None	None	25	None	None
1206	12	24	None	Foliar Spray	24	None	Foliar Spray
1208	12	22	None	None	22	None	None
1209	12	21	None	None	18	None	None
1302	13	21	None	None	21	None	None
1304	13	25	None	None	25	None	None
1307	13	13	Foliar Spray/Cut Surface	None	13	Foliar Spray/Cut Surface	None
1309	13	16	None	Foliar Spray/Cut Surface/basal spray	----	----	----
1310	13	13	None	Foliar Spray/Cut Surface/basal spray	----	----	----
1311	13	34	Cut surface	None	34	Cut surface	None
2102	21	16	None	Foliar Spray/Cut	16	None	Foliar Spray/Cut

Unit	Compartment	Alternative 2			Alternative 3		
		Acres ¹	Pre-Harvest Herbicide Treatment ²	Post-Harvest Herbicide Treatment ³	Acres	Pre-Harvest Herbicide Treatment ²	Post-Harvest Herbicide Treatment ³
				Surface/basal spray			Surface/basal spray
2104	21	39	None	None	39	None	None
2105	21	27	Cut surface	None	27	Cut surface	None
2106	21	21	None	Foliar Spray/Cut Surface/basal spray	21	None	Foliar Spray/Cut Surface/basal spray
2107	21	37	None	None	37	None	None
2108	21	17	Cut surface/foliar	None	17	Cut surface/foliar	None
2109	21	34	Cut surface/basal spray	None	34	Cut surface/basal spray	None
	Total Acres		846	96		779	66

¹ Acreages are approximations.

² See Tables 2.4 and 2.5 for herbicide concentrations and volume per acre.

³ In Units 304, 611, 702, and 1206, only 1.5 acres would be foliar sprayed post-harvest..

2.4.2.2 Non-Commercial Treatments

Three non-commercial treatment methods are proposed: understory control; mechanical timber stand improvement (TSI); and chemical TSI. Non-commercial treatments for Alternative 3 would be the same as for Alternative 2. The following narratives and Tables 2.7, 2.8, and 2.9 give information about these proposed non-commercial treatments.

Table 2.7. Summary of non-commercial treatments, by alternative, in acres

Treatment Type	Alternative 1 - No Action	Alternative 2 - Proposed Action	Alternative 3
Understory Control	0	232	232
Mechanical TSI	0	391	391
Chemical TSI	0	414	414
Total	0	1,037	1,037

Understory Control

Objective: Control undesirable understories in order to establish advanced regeneration.

No commercial timber harvest would take place. These stands have dense understories of interfering vegetation, such as beech, birch, striped maple, and mountain laurel.

A basal spray of a 5 percent solution of triclopyr, mixed with oil, would treat large woody interference would be applied to units where no harvestings would be done.

Table 2.8. Understory control treatment for Alternatives 2 and 3

Application Type	Concentration	Volume per acre	Pounds per Acre of Active Ingredient
Basal spray	12.8 oz. triclopyr (Garlon 4 or an equivalent)	5.0 gallons	2 lbs. triclopyr

Mechanical Timber Stand Improvement

Objective: Release high value, sapling-sized hardwoods to increase growth and vigor.

In old regeneration units less than 15 years old, 50 to 100 trees would be released per acre. Chainsaw felling would be used to release the crop trees. All vines would also be cut in the stands.

Chemical Timber Stand Improvement

Objective: Release high value, sapling-sized hardwoods to increase growth and vigor.

In old regeneration units between 15 and 35 years old, 50 to 75 trees would be released per acre. Herbicides would be used to release the crop trees. A cut surface treatment of 50 percent solution of triclopyr would be used to control competing trees. All vines would also be cut in the stands.

Table 2.9. Chemical timber stand improvement (TSI) treatments for Alternatives 2 and 3

Application Type	Concentration	Volume per acre	Pounds per Acre of Active Ingredient
Cut surface	50% solution triclopyr (Garlon 3A or an equivalent)	1.0 gallon	1.5 lbs./acre

2.4.2.3 NNIS (Non-Native Invasive Species) Treatment

Objective: Limit the potential for the proposed activities to spread non-native invasive plants with the potential to cause ecosystem degradation.

Garlic mustard (*Alliaria petiolata*), Japanese stiltgrass (*Microstegium vimineum*), and tree of heaven (*Ailanthus altissima*) would be controlled in and near harvest units, skid trails, skid roads, landings, and road construction, reconstruction, maintenance, and decommissioning areas where the disturbance associated with these activities could spread these species. Initial control would take place prior to any activities to reduce the bank of seeds and plant parts available for spread. Repeated control during and after harvest activities likely would be necessary on existing infested areas and newly disturbed areas that are likely to be invaded. This follow-up control could occur annually for as long as five to seven years. See Table 2.10 for information about NNIS treatment.

Table 2.10. Herbicide treatment of NNIS applicable to action Alternatives 2 and 3

Species	Alternative 2		Alternative 3	
	Pre-activity Treatment Acres	Post-activity Treatment Acres	Pre-activity Treatment Acres	Post-activity Treatment Acres
Garlic mustard	9	18	9	15
Japanese stiltgrass	15	32	13	25
Tree of heaven	9	16	9	15

Garlic Mustard – Garlic mustard would be controlled by foliar application of glyphosate (2 to 3 percent) at an application rate of up to 7 lbs acid equivalents (a.e.) per acre. During each year that control efforts are conducted, application would occur once in early spring between mid-March and the end of April. Because garlic mustard is a biennial plant that stays green all year, application at this time of year would maximize control by killing second year plants, as well as many newly sprouted first year plants. Also, because glyphosate is non-selective and will harm any plant that is green at the time of application, this timing would minimize effects on many non-target plants that have not yet broken winter dormancy. An aquatic formulation of glyphosate would be used within 50 feet of intermittent and perennial streams. Applications to isolated spot infestations would be made using a backpack sprayer. If any continuous infestations occur along roads, skid trails, utility corridors, etc., a truck-mounted or ATV-mounted sprayer may be used.

At the discretion of the Responsible Official, hand-pulling could be substituted for herbicide to control very small spot infestations or infestations in sensitive locations. If hand-pulling were used, it would occur between mid-April and mid-June of each treatment year.

For Alternative 2, pre-activity control would occur at four sites totaling approximately 9 acres. Post-activity control would occur at the same four sites, but likely would need to cover newly disturbed areas also. Therefore, post-activity control is estimated at approximately 18 acres. Continuous broadcast spray coverage likely would not be needed across the entire acreage; rather, coverage likely would consist of scattered spot control within the identified area.

Japanese Stiltgrass – Japanese stiltgrass would be controlled by post-emergence foliar application of imazapic. Imazapic is a semi-selective herbicide that controls certain grasses, including Japanese stiltgrass, but also affects certain broadleaved plants. Some desirable species of sedges and legumes are reported to be unaffected by imazapic. During each year that control efforts occur, herbicide application would take place twice between mid-May and the end of August, with the two applications occurring approximately four weeks apart. Research has suggested that one application may not provide adequate control. Imazapic is relatively non-toxic to terrestrial and aquatic life; therefore, buffering around riparian areas is not necessary. Application directly to aquatic habitats would be avoided. Applications to isolated spot infestations would be made using a backpack sprayer. If any continuous infestations occur along roads, skid trails, utility corridors, etc., a truck-mounted or ATV-mounted sprayer may be used.

At the discretion of the Responsible Official, hand-pulling or mowing using a gas-powered string trimmer could be substituted for herbicide to control very small spot infestations or infestations in sensitive locations. If hand pulling were used, it would occur between mid-May and late August of each treatment year. If mowing were used, it would take place once in August of each treatment year.

For Alternative 2, pre-activity control would occur at 14 sites totaling approximately 15 acres. Post-activity control would occur at the same 14 sites and is estimated at approximately 32 acres. Continuous broadcast spray coverage likely would not be needed across the entire acreage; rather, coverage likely would consist of scattered spot control within the identified area.

Tree of Heaven – Low-growing seedlings would be treated using a foliar application of 2 percent triclopyr (up to 1 lb. a.e. per acre) or 2 percent glyphosate. If control is needed within 50 feet of perennial or intermittent streams, the aquatic formulation of glyphosate would be used for foliar applications. Foliar applications to isolated spot infestations would be made using a backpack

sprayer. If any continuous infestations occur along roads, skid trails, utility corridors, etc., a truck-mounted or ATV-mounted sprayer may be used.

Saplings and trees would be treated using a basal spray, stem injection, or cut stump application of 25 percent triclopyr. Stem injection and cut stump applications would use water as the diluent, whereas basal spray would use an oil diluent. Spray drift and runoff are less of a concern with these application methods, so aquatic formulation glyphosate would be substituted only within 25 feet of intermittent and perennial streams. For maximum effectiveness, all herbicide treatments for tree of heaven would occur during mid to late summer (no later than the autumnal equinox).

At the discretion of the Responsible Official, hand-pulling and root grubbing of small seedlings could be substituted for herbicide to control very small spot infestations in sensitive locations. If hand-pulling were used, it could occur any time of year that the plants are visible and identifiable.

For Alternative 2, pre-activity control would occur at six sites totaling approximately 9 acres. Post-activity control would occur at the same six sites and is estimated at approximately 16 acres. Continuous coverage by broadcast spraying, basal spray, and cut surface methods likely would not be needed across the entire acreage; rather, coverage likely would consist of scattered spot control within the identified area.

NNIS treatments under Alternative 3 would be substantially similar to those described above for Alternative 2. However, less total acreage would need to be treated due to the reduced level and intensity of timber harvest in Alternative 3.

2.4.2.4 Road Construction, Reconstruction, Maintenance, and Decommissioning

Alternatives 2 and 3 propose road maintenance, reconstruction, construction, and decommissioning. Tables 2.11 and 2.12 give information about the proposed road work.

Table 2.11. Summary of road work, by alternative, in acres

Type of Road Work	Alt 1	Alt 2	Alt 3
Construction	0	4.58	3.26
Reconstruction	0	0.50	0.00
Maintenance	0	20.27	20.27
Decommissioning	0	0.94	1.44
Maintenance - State Routes	0	7.60	5.85
Maintenance - Other Routes	0	1.76	1.76
Total Miles of Road Work	0	35.65	32.58

Maintenance – Maintenance could include items such as: mowing; clearing and grubbing; grading; pulling ditches; seeding and mulching; cleaning, adding, and replacing culverts; adding or cleaning dips; adding or replacing signs; adding or maintaining gates or other closure devices; placing aggregate surfacing and/or outlet pads; minor excavating; or cutting/filling as needed to maintain the roadway.

Reconstruction – Reconstruction could include items such as: mowing; clearing and grubbing; grading; pulling ditches; seeding and mulching; cleaning, adding, and replacing culverts; adding or cleaning dips; adding or replacing signs; adding or maintaining gates or other closure devices;

placing aggregate surfacing and/or outlet pads; hardening: excavating; cutting/filling; widening; and realigning sections.

Construction – Construction involves building a new road where no road bed currently exists, or bringing an existing non-system road up to standard and adding it to the system. Construction could include items such as: clearing and grubbing; adding culverts and dips; adding gates or other closure devices; adding signs; adding aggregate; seeding and mulching; excavating; cut and fill; and grading and reshaping the ditches and roadway.

Decommissioning – Decommissioning could include: clearing, excavating; cut and fill; removing culverts or dips; seeding and mulching; ripping the surface; planting; adding or maintaining closure devices; adding or maintaining signs; putting drains back to contour; putting the sideslope back to contour; and/or outslipping the roadway.

Road work in Alternative 3 would be the same as in Alternative 2, except that Alternative 3 would have:

- 1.32 miles less road construction on NFS lands.
- 0.5 mile more decommissioning of Forest Roads.
- 1.75 miles less road maintenance on WV State roads.

2.12. Details of road work, by alternative, in acres

Route Number	New Number	Alt 2. Length in Miles	Alt 3. Length in Miles	Type of Road Work
751		0.50	0.00	Reconstruction
751		0.94	1.44	Decommission
751A	751A	0.81	0.00	Construction
PRE-112/4 to 751		1.75	0.00	Maintenance - State or other Road
SR 7, Twelvemile		0.80	0.80	Maintenance - State or other Road
226		0.40	0.40	Maintenance
226A	226A	0.49	0.49	Construction
225		0.45	0.45	Maintenance
Heli near 503	221	0.05	0.05	Construction
PRE 24/17		2.32	2.32	Maintenance - State or other Road
905		0.89	0.89	Maintenance
905A	905A	0.08	0.08	Construction
gated spur	904	0.06	0.06	Construction
940		1.54	1.54	Maintenance
940A	940A	0.10	0.10	Construction
903		3.13	3.13	Maintenance
Heli across from 301	762	0.02	0.02	Construction
Landing in 301	761	0.05	0.05	Construction
TUC-16 to 940		1.21	1.21	Maintenance - State or other Road
930		0.75	0.75	Maintenance
930D	930D	0.06	0.06	Construction
TUC-9 to 930		1.14	1.14	Maintenance - State or other Road
929 west		1.52	1.52	Maintenance

Route Number	New Number	Alt 2. Length in Miles	Alt 3. Length in Miles	Type of Road Work
929A		0.91	0.91	Maintenance
929C		0.84	0.84	Maintenance
929CA	929CA	0.44	0.44	Construction
929 east		2.36	2.36	Maintenance
929AA	929AA	0.07	0.07	Construction
929F	929F	0.32	0.32	Construction
929E	929E	0.88	0.88	Construction
929 Shortcut	929G	1.76	1.76	Maintenance - State or other Road
Near 702 East	910	0.02	0.02	Construction
Near 702 West	911	0.02	0.02	Construction
121		2.13	2.13	Maintenance
121A	121A	0.51	0.00	Construction
TUC 250/4		0.38	0.38	Maintenance - State or other Road
935		2.60	2.60	Maintenance
119		2.16	2.16	Maintenance
119A		0.59	0.59	Maintenance
404 and 501	219	0.22	0.22	Construction
west of 1202	951	0.38	0.38	Construction
Total		35.65	32.58	

2.4.2.5 Road Access Management

In Alternative 2, National Forest System Roads (FRs) in the Hogback area would remain closed, with the following exceptions or changes:

- The same section of FR 929 that is currently open year round to the public would remain open year round.
- Class Q hunter access would remain on 1.24 miles of FR 929A.
- Seasonal public motorized use would continue to be allowed on 1.1 miles of FR 935 from October 8 to February 28 yearly.

Road access in Alternative 3 would be the same as in Alternative 2, except that:

- Class Q hunter road access would be eliminated from the 1.24 miles on FR 929A.
- Class Q hunter road access would instead be allowed on the first 1.3 miles of FR 905.
- Seasonal public motorized use would increase from 1.1 miles to 2.6 miles on FR 935 from October 8 to February 28 yearly.

2.4.2.6 Hile Run Site Rehabilitation

Objective: Restore soil productivity and vegetative cover and stability in the Hile Run area and other areas impacted by vehicle use, dispersed recreation, or other activities.

Within and adjacent to proposed Unit 1101 in the Hile Run area, a 1-acre stretch of land between State Route 9 and Horseshoe Run has been subject to vehicle use and dispersed camping that is causing resource damage. These activities have resulted in loss of vegetation and soil

compaction. This alternative would require ripping and seeding of rutted and ponded areas within the stand. The depth of ripping would be dependent upon the depth of compaction. The end result would be to return impacted areas to well-drained soils like the soils under the pine stand. Water would infiltrate the soil readily and not pond on the surface. Vegetation would become re-established and help provide soil stability. Barriers, such as rocks, may also be placed to prevent access to the site.

Rehabilitation of the Hile Run area would be the same under both Alternatives 2 and 3.

2.4.2.7 Wildlife Openings - Conversion and Maintenance

Openings/Non-forested Habitat - Maintained openings, linear openings (grassy roads) and non-forested habitat are important wildlife habitat components. Although regenerating timber (less than 10 years of age) serves as temporary openings, wildlife communities associated with non-forested habitat are different from those found in regenerated timber stands. The difference is largely due to the amount of dense, continuous herbaceous cover, which lasts longer in permanent openings than in regenerating stands. Size of openings is also a consideration. Wildlife that use only non-forested habitats tend to be species that utilize primarily larger openings (5 to 10 acres), while species that utilize forest and non-forest types are found using smaller-sized openings.

Landing Conversion to Wildlife openings – Up to 20 log landings would be converted to permanent grass/forb habitat (wildlife openings). Although these openings would be considered permanent, future management activities may always drop maintenance of them, allowing the area to grow back into forest. Conversion of landings into wildlife openings would involve disking the area, application of lime and fertilizer, re-seeding with native grasses, and planting native shrubs and fruit trees if applicable.

Maintenance of wildlife openings would be accomplished with a brush-hog and tractor. Areas would be mowed approximately on a three-year rotation basis.

Waterhole construction – This activity would usually be completed in conjunction with wildlife opening creation if there are areas adjacent to or within the opening that are suitable for small wildlife waterholes. Up to 25 waterholes would be created. Waterholes would be excavated with either a dozer or backhoe on-site, and would usually be no more than 30 feet across and no deeper than 3 feet. Size, shape, and depth would be dependent upon the location, soil type, and water source(s) available to fill the waterhole (e.g., spring, rainwater). The edges of waterholes would be gradual to allow wildlife access at various water levels, and if possible, would also have a tree bole across and in the water to create additional habitat. Waterholes would be maintained if needed, if sediment or water vegetation were impacting their function.

Conversion and maintenance of wildlife openings would be slightly less under Alternative 3 than under Alternative 2 because fewer landings would be created under Alternative 3. Waterhole construction and maintenance would be the same under both Alternatives 2 and 3.

2.4.2.8 Public Safety

Standard provisions will be included in all timber sale contracts to protect the safety of others. Signs will be placed along roads to inform individuals of increased traffic resulting from timber sale operations and other treatments. Closure orders will be issued to prevent public access to: units and areas being harvested or treated; roads being constructed, reconstructed, maintained, or

decommissioned; roads, trails, and other areas that helicopters are flying over; and areas where the safety of individuals or property may be impacted by project activities (e.g., dispersed camping and picnic sites).

Activities to ensure public safety would be substantially similar under both Alternatives 2 and 3. Closure and signing activities would be site-specific and time-specific to the other Hogback project activities taking place.

2.4.3 Monitoring Applicable to Action Alternatives 2 and 3

Table 2.13. Monitoring applicable to action Alternatives 2 and 3

Resource	Monitoring Description	Who's Responsible for Monitoring?
Developed and Dispersed Recreation Sites	# of sites affected	Recreation Staff
Trails	Any effects to the 701 Allegheny Trail from adjacent harvest/treatment activities: number/ linear feet.	Recreation Staff
NNIS	For garlic mustard, Japanese stiltgrass, and tree of heaven potentially spread by project activities, especially on landings and skid roads/trails.	Ecology Staff
Silviculture	Stocking surveys. 2 nd and 5 th years after regeneration to ensure proper stocking after regeneration harvest. # of trees per acre.	Silviculture, Timber Staff

2.4.4 Design Features and Mitigation Measures Applicable to Action Alternatives 2 and 3

All alternatives have been designed to meet applicable state and federal laws and regulations, Forest Service policy and directives, and Forest Plan standards and guidelines. The implementation practices or features shown in Table 2.14 would be used with the specified activities, if selected, to help meet Forest Plan direction. This table gives additional detail on how to implement Forest Plan direction, especially when Forest Plan direction is general, or a specific method of implementation is recommended to ensure the desired results.

Table 2.14. Design features and implementation strategies applicable to action Alternatives 2 and 3

Resource and Concern	Forest Plan Direction	Implementation Practice or Feature
Successful regeneration: Deer over browsing on regeneration	TR05	Tops and branches would be left in all units and pulpwood would be left in all regeneration units except Units 603, 1309, 1310, 2102, and 2106.
Restoration of white pine: Conversion of forest types	TR23	Plant white pine in selected units to restore pine component.
Increase red oak and black cherry component: Consider other resources in TSI activities	TR24	Red oak and black cherry will be favored for release to increase mast production.

Resource and Concern	Forest Plan Direction	Implementation Practice or Feature
Native Plants	VE06, p. II-18	All seeding for soil stabilization, wildlife openings, etc. should use a site-appropriate mix of native grasses and/or forbs. A cover/nurse crop should be included in the mix to ensure adequate soil stabilization while the native grasses and forbs become established. The cover/nurse crop does not have to be native as long as it is not invasive.
Rare Communities	SW51, p. II-13	<p>The following design criteria apply to seeps and other wetlands:</p> <ul style="list-style-type: none"> • Maintain leave clumps in and immediately adjacent to seeps and other wetlands. Canopy closure over seeps should not be reduced below 60 percent. Specific locations of seeps and wetlands are not known at this time; however, if any are encountered during sale layout, they should be protected in this manner. • Avoid dragging logs through seeps and piling slash in seeps. • Consider seep location in skid trail layout. Avoid seeps to the extent possible. Essential crossings should be at right angles and should keep cut and fill to a minimum to minimize damage to seeps.
Rare Communities	VE14, p. II-19	<p>The following design criteria apply to rock outcrops:</p> <ul style="list-style-type: none"> • Locate skid trails, roads, landings, cable routes, etc. such that they do not impact major outcrops.
NNIS	VE20 through VE24, pp. II-19 through II-20	Infestations of garlic mustard, Japanese stiltgrass, and tree of heaven must be controlled to limit potential spread by timber harvest and road construction. Other species with the potential to degrade forested ecosystems currently are not known to occur, but should be controlled if they appear in activity areas. Ongoing control and monitoring will be necessary before, during, and after timber harvest and road construction activities, until infested areas are shown to be free of these species for three consecutive growing seasons, or until the Responsible Official determines that effective control is not possible.
NNIS	VE20 through VE24, pp. II-19 through II-20	For activity areas known to be infested with NNIS capable of invading forested ecosystems, monitor the extent of the infestation and success of control measures on an annual basis during and after project implementation until control measures have been determined to be completed. Monitoring should concentrate on skid trails, landings, new roads, and other areas of disturbed soil, but should also include other parts of harvest units. Methods and extent of monitoring will be dependent on the characteristics of the units to be monitored.
NNIS	VE20 through VE24, pp. II-19 through II-20	To the extent possible, inspect sources of gravel and borrow material for NNIS plant material. Do not use material that is known or suspected to contain NNIS plants with the potential to invade forested ecosystems

Resource and Concern	Forest Plan Direction	Implementation Practice or Feature
NNIS	VE20 through VE24, pp. II-19 through II-20	Ideally, all seed mixtures used for soil stabilization, wildlife openings, etc. should be certified weed-free. However, there is a good possibility that certified seed will not be available. In this case the seed vendor's test results for noxious weed content should accompany the seed shipment and should demonstrate that the seed is substantially free from noxious weed seeds.
NNIS	VE20 through VE24, pp. II-19 through II-20	Before entering National Forest land, all logging equipment, construction equipment, and other vehicles must be free of all soil, seeds, vegetative matter, or other debris that could contain or hold seeds. Equipment and vehicles that are used in the project area must be washed thoroughly before being moved to any other area of National Forest land. Vehicle and equipment washing should not be conducted on National Forest land.
TES Plants	VE13, p. II-19	Buffer known locations of Appalachian blue violet by 75 feet. Appalachian blue violet currently is known to occur in three units. Within the buffer, maintain at least 60 percent canopy closure, and avoid foliar application of herbicide. Targeted herbicide applications such as basal spray and cut surface are allowed as long as care is taken to avoid dripping or spilling herbicide on the violets. Skid trails are allowed in the buffer as long the trails avoid the violets and do not reduce canopy closure below 60 percent.
TES Plants	VE13, p. II-19	Avoid cutting and applying herbicide to butternuts. Due to similarity of appearance to butternut, species identification of black walnuts to be cut must be confirmed by checking nut shape, leaf scars, and/or pith color. Likewise, species identification of tree of heaven to be controlled must be confirmed by checking the leaf margin (entire vs. toothed), glands at leaf bases, or presence of samaras.
TES Plants	VE13, p. II-19	Avoid impacting the rock skullcap location alongside the extension of FR 929. If the footprint of the road is to be widened at this location, all widening must occur on the side of the road opposite the rock skullcap. Log truck traffic must not stray off of the current travel surface.
TES Plants	VE13, p. II-19	If other rock skullcap locations are found in harvest units, buffer them by 75 feet. Avoid all harvesting, skidding, and other ground and vegetation disturbance in the buffer. Avoid foliar herbicide application in the buffer unless it is necessary to control non-native invasive plants that threaten the skullcap occurrence. Any such application must carefully avoid exposing the skullcap to herbicide.
TES Plants	VE13, p. II-19; TE71, p. II-27	If any other TES plants are found in harvest units, buffer the locations by at least 75 feet. Avoid harvest activities, ground disturbance, and other vegetation-disturbing activities within these buffers. Avoid foliar herbicide application in the buffer unless it is necessary to control non-native invasive plants that threaten the TES occurrence. Any such application must carefully avoid exposing the TES plants to herbicide.

Resource and Concern	Forest Plan Direction	Implementation Practice or Feature
Heritage Resources. Previously unknown heritage sites may be discovered during project implementation. They and need to be protected from damage and evaluated.	HR04, HR05, HR08, HR09	Should additional or potential prehistoric or historic sites be located during the course of implementation, the Forest Archaeologist should be notified and activity in that area cease until the size and nature of the resource can be determined.
Heritage Resources. Known heritage sites need to be protected from project implementation, including tree felling.	HR05, HR08	All sites having potential direct effects from project activities should be marked and avoided during all phases of project implementation. If tree felling occurs adjacent to a heritage resource, it is recommended that either directional felling away from the site be implemented, or a buffer comprising the height of the nearest possible fell, plus one-half, be established.
Water and fish habitat quality. Preliminary maps show 340' of skid road for Unit 2106 are within 100' of an unnamed tributary to Wolf Run. Roads within 100 feet of streams are more likely to deliver sediment to streams than roads farther away.	SW40	When skid roads are laid out on the ground for Unit 2106, the skid roads should be located at least 100 feet from the unnamed tributary to Wolf Run.

The mitigation measures shown in Table 2.15 below, if selected for implementation by the Deciding Official, will be used with the specified actions to help reduce or eliminate potential negative impacts and to help meet Forest Plan direction. In many cases, the mitigation measures apply to specific units, areas, and/or alternatives.

Table 2.15. Mitigation measures applicable to action Alternatives 2 and 3

Resource and Concern	Applied to Alternative #(s)	Mitigation Measure	Effectiveness Information & Reference
Successful regeneration. Deer over-browsing on regeneration is more likely in small units.	2, 3	Do not have any leave clumps in Unit 701 due to small size of unit.	Horsley 1983.
Water and fish habitat quality. Preliminary maps show 340' of skid road for Unit 2106 are within 100' of an unnamed tributary to Wolf Run. Roads within 100 feet of streams are more likely to deliver sediment to streams than roads farther away.	2, 3	When skid roads are laid out on the ground for Unit 2106, the skid roads should be located at least 100 feet from the unnamed tributary to Wolf Run.	Forest Plan SW40 (standard)

Resource and Concern	Applied to Alternative #(s)	Mitigation Measure	Effectiveness Information & Reference
<p>Visitor safety and enjoyment. Harvesting and other treatment activities near trails, roads, developed recreation areas, and dispersed recreation sites could impact users' safety and enjoyment.</p>	2, 3	<p>Post information during harvest and treatment activities at:</p> <ul style="list-style-type: none"> • access points to Trail 701 and the unnamed trail to the high point of Maryland; <p>Have closure orders during harvest and treatment activities for:</p> <ul style="list-style-type: none"> • Trail 701 and dispersed camp sites in the Twelvemile area if helicopter landing(s) are used near Units 202 or 1203, • the unnamed trail to the high point of Maryland while logging unit 504, and • any other trails, roads, recreation sites, or areas where project implementation may pose a risk to visitors. 	<p>Forest Plan: RC01, 3005.</p> <p>Informing visitors about activities will allow visitors to make informed decisions about where they want to and are allowed to go.</p> <p>Temporarily eliminating visitor use during harvest and treatment activities near roads, trails, recreation sites, and other areas potentially affected will reduce risks to visitors and decrease bad experiences.</p>
<p>Trail conditions and maintenance. Trails could be damaged by vehicles or harvest equipment crossing them. Future trail maintenance could be made more difficult if not enough trees and shade are left along the trails.</p>	2, 3	<p>Trail 701 near Units 202, 1203, and 1205 and unnamed trail to high point of Maryland near Unit 504 should be protected by: minimizing or eliminating trail crossings by: vehicles or harvesting equipment; log skidding; and road construction during harvesting operations. leaving a sufficient number of trees along the trail corridor to permit signing/ blazing and to provide shade to minimize undergrowth (grasses/brush, etc.). Within 50 feet of the trail, leave 50% of shade-producing basal area. using slash disposal cleanup clause for Units 504 and 1203.</p>	Forest Plan: RC28, RC31.
<p>Minerals, Safety. If there were a gas-related emergency, gas company personnel would need timely access to the site. Delays due to road work could make the emergency worse.</p>	2, 3	<p>Road closures due to road work should be minimized to the extent possible to provide for timely access to gas facilities. The FS should coordinate with the gas companies on road closures so that alternate strategies for access in case of emergencies can be developed.</p>	Common sense

Resource and Concern	Applied to Alternative #(s)	Mitigation Measure	Effectiveness Information & Reference
Minerals, Safety. Running heavy equipment over gas lines or other facilities could lead to rupture of the pipeline, damage to facilities and equipment, and injury to people.	2, 3	Unit 702: Coordinate with Horseshoe Run, LLC, to ensure that Unit 702, its landing, and access roads/trails are not located on the gas line ROW or the pig launcher/retriever.	Avoidance would be most effective. If avoidance is not possible, see the Minerals Specialist Report for other possible mitigation measures.
Minerals, Safety. Running heavy equipment over gas lines or other facilities could lead to rupture of the pipeline, damage to facilities and equipment, and injury to people.	2	Unit 709: Coordinate with Horseshoe Run, LLC to ensure that Unit 709, its landing, and access roads/trails are not located on the gas line ROW.	Avoidance would be most effective. If avoidance is not possible, see the Minerals Specialist Report for other possible mitigation measures.
Minerals, Safety. Running heavy equipment over gas lines or other facilities could lead to rupture of the pipeline, damage to facilities and equipment, and injury to people.	2, 3	Unit 605: Coordinate with Horseshoe Run, LLC to ensure that Unit 605, its landing, and access roads/trails are not located on the gas line ROW.	Avoidance would be most effective. If avoidance is not possible, see the Minerals Specialist Report for other possible mitigation measures.
Minerals, Safety. If there were a gas-related emergency, gas company personnel would need timely access to the site. Delays due to road work could make the emergency worse.	2, 3	Unit #607: Coordinate with MegaEnergy Operating, Inc. to ensure that Hogback activities do not interfere with their SUP for construction and maintenance of the existing tie-in road from 929 to the Smith private property, and use of 929 for access to the well site and the Smith Pipeline	Common sense and courtesy
NNIS Hay used for mulch may contain NNIS seed that would introduce NNIS to new locations or introduce new species.	2, 3	Because a local source for weed-free mulch is not yet available, use straw or coconut fiber matting instead of hay mulch.	Forest Plan: VE20, p. II-19. Straw comes from intensively managed grain fields, which often are subject to herbicide applications and therefore are less likely to contain NNIS than hay fields. Coconut fiber mulch doesn't come from a field and thus has a low likelihood of containing NNIS.

2.5 Comparison of Activities by Alternative

Table 2.16 summarizes the activities that may be implemented under each alternative.

Table 2.16. Summary comparison of activities proposed, by alternative

Activity	Alternative 1 - No Action	Alternative 2 – Proposed Action	Alternative 3
Convert landings to wildlife openings	0	up to 54 acres	up to 47 acres
Maintain wildlife openings (existing + new)	42 acres	up to 96 acres	up to 89 acres
Create + maintain waterholes	0	up to 25	up to 25
Rehabilitate Hile Run area	0 acres	1 acre	1 acre
Clearcut with reserves- cove hardwood or mixed oak	0 acres	1,187 acres	1,077 acres
Clearcut with reserves – oak pine	0 acres	69 acres	40 acres
Shelterwood regeneration harvest	0 acres	88 acres	66 acres
Fencing	0 acres	104 acres	81 acres
Pre-harvest herbicide treatments	0 acres	846 acres	779 acres
Post-harvest herbicide treatments	0 acres	96 acres	66 acres
Black walnut seedling planting – 20/unit	0 units	4 units	3 units
White pine seedling planting – 200/acre	0 acres	90 acres	61 acres
Overstory removal	0 acres	63 acres	60 acres
Commercial thinning	0 acres	53 acres	53 acres
Garlic mustard (NNIS)	pre-activity treatment	0 acres	9 acres
	post-activity treatment	0 acres	18 acres
Japanese stiltgrass (NNIS)	pre-treatment activity	0 acres	15 acres
	post-treatment activity	0 acres	32 acres
Tree of heaven (NNIS)	pre-treatment activity	0 acres	9 acres
	post-treatment activity	0 acres	16 acres
Chemical understory control	0 acres	232 acres	232 acres
Mechanical timber stand improvement (TSI)	0 acres	391 acres	391 acres
Chemical timber stand improvement (TSI)	0 acres	414 acres	414 acres
Mechanical site preparation with hand tools	0 acres	1,357 acres	1,185 acres
Timber volume removed	0 MMBF	14.4 MMBF	12.6 MMBF
Conventional ground-based skidding	0 acres	566 acres	280 acres
Helicopter yarding	0 acres	558 acres	694 acres
Cable yarding	0 acres	349 acres	324 acres
Potential helicopter landings	0 landings	23 landings	21 landings
Potential conventional landings	0 landings	31 landings	25 landings
Road maintenance - NFS roads	0 miles	20.27 miles	20.27 miles
Road maintenance - State routes	0 miles	9.36 miles	7.61 miles
Road construction	0 miles	4.58 miles	3.26 miles
Road reconstruction	0 miles	0.50 miles	0.00 miles
Road decommissioning	0 miles	0.94 miles	1.44 miles
Skid roads/trails w/ ground disturbance	0 miles	26 miles	16 miles

¹ Figures provided in this table are approximations.

² Fencing may be implemented if post-harvest monitoring indicates a need for such action to ensure successful regeneration of shade-intolerant species.

An explanation of each alternative's consistency with the Forest Plan is provided in the "Forest Plan Consistency" sections in Chapter 3. Implementing any of the alternatives would not require an amendment to the Forest Plan. If an action alternative is selected, timber sale, and possibly road contracts, would be awarded to implement the selected alternative. These contracts would contain terms and conditions that would help implement design features and mitigation requirements such as those listed in Tables 2.14 and 2.15, or imposed by statute, regulation, or Executive Order.

2.6 Comparison of Environmental Effects by Alternative

Table 2.17 below summarizes how the alternatives differ in regards to their achievement of project objectives (Chapter 1), their response to issues (Chapter 2), and resource impacts (Chapter 3). An explanation of each alternative's consistency with the Forest Plan is provided in the "Forest Plan Consistency" sections in Chapter 3.

Table 2.17. Summary comparison of environmental effects, by alternative

	Alternative 1 - No Action	Alternative 2 - Proposed Action	Alternative 3
Response to Issues			
Issue 1: Soil Erosion & Stream Sedimentation			
Acres of new soil exposed	0 acres	115 acres short-term; 44 acres long-term	95 acres short-term; 36 acres long-term
Percent of Hogback project area affected by ground disturbance	0 acres	8% short-term; 3% long-term	7% short-term; 3% long-term
Issue 2: Herbicide Use – Commercial & Non-Commercial Treatments and NNIS			
Acres treated with herbicides	0 acres	1,654 acres (1,588 + 66 NNIS)	1,506 acres (1,451 + 55 NNIS)
Acres of foliar application	0 acres	521 acres	477 acres
Acres of basal spray, cut surface, and cut stump application (some duplication of numbers if a unit gets one of these treatments plus foliar application.	0 acres	1,582 acres	1,425 acres

	Alternative 1 - No Action	Alternative 2 - Proposed Action	Alternative 3
Pounds of active ingredient applied per acre by method	0	<p><u>Pre-harvest:</u></p> <ul style="list-style-type: none"> • Cut surface – 0.125 lbs/acre imazapyr; • Basal spray – 2 lbs/acre triclopyr; • Foliar Spray – 0.094 lbs/acre sulfometuron-methyl and 2.7 lbs/acre glyphosate <p><u>Post-harvest:</u></p> <ul style="list-style-type: none"> • Cut surface – 2.7 lbs/acre glyphosate; • Basal spray – 2 lbs/acre triclopyr; • Foliar spray – 0.375 lbs/acre imazapyr and 2.7 lbs/acre glyphosate <p><u>Chemical understory control:</u></p> <ul style="list-style-type: none"> • Basal spray - 2 lbs/acre triclopyr <p><u>Chemical TSI:</u></p> <ul style="list-style-type: none"> • Cut surface - 1.5 lbs/acre triclopyr <p><u>NNIS:</u></p> <ul style="list-style-type: none"> • Garlic mustard – foliar spray – maximum up to 9.3 lbs/acre glyphosate • Japanese stiltgrass – foliar spray – imazapic • Tree of heaven – cut surface or basal spray or foliar spray – maximum up to 1.4 lbs/acre triclopyr 	
Measurement Indicators for Purpose & Need			
Acres of wildlife openings created	0 acres	54	47
Acres of mast-producing species (mixed oak and mixed hardwoods) regenerated (cc + shelterwood)	0 acres	1,275 acres	1,143 acres
Acres maintained or improved by thinning	0	858 acres	858 acres
Volume provided	0 MBF	14,442 MBF	12,636 MBF
Acres harvested (cc, shelterwood, commercial thin, overstory removal)	0 acres	1,460 acres	1,296 acres
Soils/Geology Impacts			
Acres of effects to soil productivity	0 acres	115 acres short-term 44 acres long-term	95 acres short-term 36 acres long-term
Percent of activity area soils affected	0 %	8% short-term 3% long-term	7% short-term 3% long-term
Feet of skid roads/trails that intersect wet soils	0 feet	356 feet	152 feet
Hydrology/Watershed & Aquatic Impacts			
Air Impacts			
Primary Criteria Pollutants	No violations of the NAAQS for criteria pollutants.	No violations of the NAAQS for criteria pollutants.	No violations of the NAAQS for criteria pollutants.

	Alternative 1 - No Action	Alternative 2 - Proposed Action	Alternative 3
Vegetation Impacts			
Number of Units	0	54	48
Pine-Oak acres regenerated	0	69	40
Shelterwood-acres	0	88	66
Overstory Removal - acres	0	63	60
Timber Stand Improvement	0	805	805
Understory control	0	232	232
Threatened and Endangered Species Impacts			
West Virginia northern flying squirrel	NE	NE	NE
Virginia big-eared bat	NE	NE	NE
Indiana bat	NE	NE	NE
Cheat Mountain salamander	NE	NE	NE
Shale barren rock cress	NE	NE	NE
Virginia spirea	NE	NE	NE
Small whorled pogonia	NE	NLAA	NLAA
Running buffalo clover	NE	NLAA	NLAA
Sensitive Species Impacts			
54 RFSS plant species	NE	MII* (32 species); NE (22 species)	MII* (32 species); NE (22 species)
51 RFSS terrestrial animal species	NE	MII* (14 species); NE (37 species)	MII* (14 species); NE (37 species)
10 RFSS aquatic animal species	NE	NE (10 species)	NE (10 species)
* MII = may impact individuals or habitat, but not lead to federal listing or loss of viability			
Management Indicator Species Impacts			
Native brook trout	NE	MII*	MII*
Cerulean warbler	NE	MII*	MII*
Wild turkey	NE	MII*	MII*
Economic Impacts – in dollars			
Present Net Value	0	-\$1,145,317	-\$1,068,836
Benefit Cost Ratio	0	0.69	0.67
Environmental Justice Impacts			
Effects to minority and low-income populations [EO 12898]	None	No disproportionate impact on minority or low income populations	No disproportionate impact on minority or low income populations
Heritage Resource Impacts			
Consistent with Heritage protection laws	Yes	Yes	Yes
Recreation Impacts			

	Alternative 1 - No Action	Alternative 2 - Proposed Action	Alternative 3
Number of developed and dispersed sites affected	0	2	2
Miles of public road access affected	<ul style="list-style-type: none"> Class Q hunter access would remain on 1.24 miles of FR 929A. Seasonal public motorized use would be allowed on 1.1 miles of FR 935. 	<ul style="list-style-type: none"> Class Q hunter access would remain on 1.24 miles of FR 929A. Seasonal public motorized use would be allowed on 1.1 miles of FR 935. 	<ul style="list-style-type: none"> Class Q hunter road access would change from 1.24 miles on FR 929A to the first 1.3 miles of FR 905. Seasonal public motorized use would increase from 1.1 miles to 2.6 miles on FR 935.
Number of recreation special uses affected	0	0	0
Trails affected by adjacent harvesting	0	<ul style="list-style-type: none"> Thinning Unit 1203 would have approximately 625 feet of harvest near the Allegheny Trail. Helicopter landing near 701 trail could result in closure order. Unofficial Trail to Highpoint of Maryland would have approximately 1,000 feet of harvest in shelterwood Unit 504. 	<ul style="list-style-type: none"> Thinning Unit 1203 would have approximately 625 feet of harvest near the Allegheny Trail. Helicopter landing near 701 trail could result in closure order. Unofficial Trail to Highpoint of Maryland would have approximately 1,000 feet of harvest in shelterwood Unit 504.
Visual Impacts			
Landscape Visibility: # of units not consistent with Visual Quality Objectives	0 potential; 0 actual	2 potential; 0 actual	0 potential; 0 actual
Scenic Integrity: # of units not consistent with Scenic Integrity Objectives	0 potential; 0 actual	2 potential;	0 potential; 0 actual
Scenic Attractiveness: # of units which would change the scenic attractiveness of the area	0 potential; 0 actual	0 actual	0 potential; 0 actual
Minerals Impacts			
Impacts to integrity of minerals pipelines and facilities	0	depends on mitigation measures implemented	depends on mitigation measures implemented
Achievement of Project Objectives, Purpose & Needs			
	No	Yes	Yes