

Chapter 2- Alternatives Considered

Introduction

This chapter explains how the Forest Service involved the public, describes the issues identified through public scoping, and describes and compares the alternatives considered for the Lower Williams Vegetation project.

Public Scoping

The Lower Williams Vegetation project has been listed in the Monongahela Schedule of Proposed Action beginning October 2006 through the present.

A Notice of Intent (NOI) to publish an environmental impact statement (EIS) was published in the Federal Register in November 2006. A Legal Notice announcing the opening of the public scoping period was published in the Nicholas Chronicles newspaper on November 2, 2006.

The District Ranger sent a scoping letter, dated October 31, 2006, to interested members of the public, various government agencies, adjacent landowners, environmental organizations, and the timber industry. A total of 74 scoping packages were mailed. The scoping letter, information packet, and maps were posted on the MNF website.

Comments received during these processes were used to define issues, develop alternatives, and define the level of analysis.

Issues Used to Formulate Alternatives

Issues are used to formulate alternatives, prescribe mitigation measures, and to define the scope of the environmental analysis. The responses received during the scoping period were reviewed and significant issues were identified. The issues are described below using an issue statement on the issue. Indicators are also identified which are used to track effects associated with the issue.

Issue 1- Erosion and Sedimentation

ISSUE STATEMENT A: Soil disturbance associated with timber and road management activities may increase erosion and sediment delivery to streams. This can effect soil and water quality, as well as impair trout productivity within the project area. Measures are identified to compare the potential soil disturbance in each alternative.

Indicator: Changes to the existing road and skidding system

Measure: Miles of new road construction

Measure: Miles of skid roads

Issue 2 – Acid-Sensitive Soils

ISSUE STATEMENT B: Acid sensitive soils occurring in the project area may result in regeneration problems within harvest units (aluminum toxicity to 50-100% of seedlings depending upon landscape position in the watershed).

Literature indicates that the method of timber harvest may play a role in determining how much soil quality is reduced in the unit based on the amount of ground disturbance that occurs with each method. By keeping the forest floor intact, soil nutrients are more likely to remain in place after harvest (Hallett et al, 1997). Mixing of the forest floor, displacement of the soil surface, and subsequent erosion from disturbances all act to accelerate base cation losses and nutrient leaching from the site.

In addition to the potential loss of base cations and nutrients from soil disturbance, there is a concern that base cations and nutrients are lost through the harvest and removal of trees. Measures are identified to compare the potential soil disturbance on acid-sensitive soils in each alternative, and the potential removal of trees on acid-sensitive soil in each alternative.

Indicator: Changes to the base cations and nutrients within the soil

Measure: Miles of new road construction on acid-sensitive soils

Measure: Miles of skid roads on acid sensitive soils

Measure: Acres of timber harvest on acid sensitive soils

Issue 3 - Early Successional Habitat and Openings

ISSUE STATEMENT C: The amount of early successional habitat and openings is below the desired level. Timber harvest activities are proposed to create early successional habitat and openings that contribute to the Forestwide goals and desired conditions. Measures are developed to identify the amount of early successional habitat and openings created in each alternative.

Indicator: Change in the project area into early successional habitat and openings

Measure: Acres of regeneration harvest.

Measure: Acres of created openings.

Issue 4 – Discovery of Threatened and Endangered Species and Sensitive Species

ISSUE STATEMENT D: Further analysis found running buffalo clover (federally-listed endangered species) and nodding pogonia (Regional Forester’s sensitive species) in areas that would be affected by proposed harvest, road maintenance, and/or hauling activities. Based on this information, the proposed action would impact running buffalo clover populations and nodding pogonia.

Indicator: Loss of threatened, endangered, and sensitive (TES) plant population and habitat

Measure: Acres of occupied running buffalo clover habitat impacted by activities in the alternatives considered.

Measure: Acres of occupied nodding pogonia habitat impacted by activities in the alternatives considered.

Alternatives Considered but Eliminated from Detailed Study

Minimize losses of sequestered carbon and greenhouse gas emissions: It was determined that global climate change is out of the scope of this analysis. This is not to say the Forest does not recognize research pointing to potential effects of global climate change on the health and vitality of national forests and rangelands. Conversely, we also recognize that many localized management decisions on national forest system lands potentially can have a cumulative effect on global climate. However, the cause and effect relationships of most anthropogenic and natural influences on global change are complex and interactions with sensitive ecosystem components currently are not fully understood. The onus of addressing such large scale phenomena at a time when all of the cause and effect mechanisms are not understood should not be placed on individual National Forests. Rather, the issue of global climate change has been addressed at regional and national levels.

The “Forest and Rangeland Resources Planning Act of 1974” places this responsibility at the national level by requiring that Renewable Resource Assessments (RPA’s) address “the potential effects of global climate change on the condition of renewable resources” as well as include “an analysis of the rural and urban forestry opportunities to mitigate the buildup of atmospheric carbon dioxide”. (16 U.S.C 1601) The most recent RPA assessment was completed in 2000; this document discusses global climate change, its effects on forest resources and the implications this may have for management actions regarding carbon sequestration potential of forest biomass and soils. This document also utilized current Forest Service Research on the issue.

Additionally, various research efforts related to global climate change, ecosystem effects and response, integrated modeling approaches for predicted future impacts and carbon sequestration potential of North American forests are ongoing at the national and regional scales within the Forest Service Research Branch. The following links described some of the various ongoing efforts:

- <http://www.fs.fed.us/ne/global/index.html> - Northern Global Change Research Program (NGCRP)
- <http://www.sgcp.ncsu.edu/research.htm> - Southern Global Change Research Program (SGCP)
- <http://www.carbonsequestration.us/Websites/htm/Forest-Service-FSGCRP.html> - USDA Forest Service Global Change Research Program (FSGCRP)

Through these programs, the Forest Service Research Branch is addressing both research needs, i.e. the unanswered scientific questions related to ecosystems and global climate change and the management implications related to these questions, i.e. carbon

sequestration potential. One goal of these research efforts is to equip land managers with the tools necessary to address global climate change at the land management planning and project levels. Since these tools are not widely available to forest managers at this time, the Forest felt it was more appropriate to leave this issue within the national and regional scope.

Alternatives Given Detailed Study

The following section describes each alternative given detailed study. The acres or miles identified for activities have been identified from mapping and should be considered estimates. The acres for harvesting units in Alternative 2 (Proposed Action) do not show the acres lost to riparian zone buffers and existing heritage resources sites in Table 2. The acres for riparian area buffers and heritage resources site buffers were delineated for Alternatives 3, 4, 5, and 6 and are displayed in Table 2. Use the Alternative Maps in Appendix C to view the differences between the alternatives. The descriptions or definitions of activities (i.e, harvesting activities, etc.) within the project area are found in Appendix E.

The Forest Service developed three action alternatives in response to issues raised by the public, in addition to the original proposed action (Alternative 2). Each alternative addresses the relevant issues in its own way, providing a range of management activities and intensity across each alternative. Alternative 2 is the original Proposed Action described in the Notice of Intent. A summary of the Proposed Action, as it existed during scoping, is located in Chapter 1.

A fourth alternative (Alternative 6) was developed to address the discovery of running buffalo clover and nodding pogonia. The 45-Day Comment Period for the Draft Environmental Impact Statement (SDEIS) and the completion of the botany surveys ran concurrently. Consequently, during the comment period, running buffalo clover (federally-listed endangered species) and nodding pogonia (Regional Forester’s sensitive species) were discovered in areas that would be affected by proposed harvest, road maintenance, and/or hauling activities. Based on this new information, all of the action alternatives proposed in the Draft Environmental Impact Statement would result in major impacts to a large population of running buffalo clover, and Alternatives 2 and 3 could result in loss of viability for nodding pogonia.

The following subsections will outline the consistency of proposed activities within five Action Alternatives 2, 3, 4, 5, and 6; and give a short narrative of uniqueness of the individual alternatives. Information in Table 2 is focused on activities where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Consistency of Proposed Activities in All Action Alternatives

The following are short narratives of proposed vegetation management, wildlife (forest and open treatments), and road activities that is consistent for the Action Alternatives 2, 3, 4, 5, and 6. Even though the treatments are consistent for the action alternatives, the

level of activity occasionally varies. Refer to Table 2 for numerical data in harvesting acres, miles of road construction and reconstruction, and wildlife treatment activities.

In all of the action alternatives, regeneration harvests with residuals in Unit 27 and commercial thinning in Unit 4 would use helicopter logging to remove trees. These two units are located adjacent to the Johnson Run Phase I and II Decommissioning Project Area in the North Cove sub-watershed. Several roads in the Johnson Run Area were recently decommissioned to improve the watershed. No Action Alternatives proposed conventional logging in the Johnson Run Area because it would negate these watershed improvement projects.

The road reconstruction proposed for all of the action alternatives would be in the form of road hardening to access helicopter units. This reconstruction may also include additional surfacing, roadside ditch improvement, and cutting back vegetation along the roads. These haul roads have to be upgraded to support the commercial vehicles used to move forest products from the helicopter landings.

American Chestnut and butternut would be planted as either a seed or seedling/planting stock interspersed throughout the regeneration units. There are 10 acres of planting proposed in Alternatives 2, 3, 4, and 5 and 20 acres of planting proposed in Alternative 6.

The application of herbicides would be implemented in All Action Alternatives to control invasive exotic plant species along haul roads and old skid trails and landings in and adjacent to harvest units. Herbicide would also be used to control stripe maple, beech, and other undesirable vegetation in the 38 acre shelterwood harvest unit and the 35 acre savannah unit. Glyphosate and triclopyr are the types of chemicals that would be used. The methods of application that could be used are cut surface, truck/tractor/ATV mounted applicator, and backpacks.

Consistency of Proposed Activities in Alternatives 2, 3, 4, and 6

Action alternatives 2, 3, and 4 propose road reconstruction to access conventional logged units. The level of road reconstruction varies from replacing or installing larger culverts, road widening, to realignment of roads. The miles of road reconstruction is directly related to the method of harvesting, whether it is conventional or helicopter logging. The Alternative(s) with the most conventional logging proposed also would propose more road reconstruction, than the alternatives where over half of the acres would be helicopter logged. This type of road reconstruction is displayed in Table 2 as “Road Reconstruction – Existing Corridor”.

The road reconstruction proposed for haul roads to access helicopter landings would not consist of road realignment, widening, and replacing and/or installing larger culverts. This road reconstruction is simply adding gravel to the roads. Displayed in Table 2 as “Road Reconstruction – Hardening.”

Consistency of Proposed Activities in Alternatives 2, 3, and 6

The wildlife management forest treatment proposed for all of the action alternatives is the seeding of landings to create wildlife openings and maintenance of openings. The level of wildlife opening creation would vary among the action alternatives. After the wildlife

openings are created maintenance of the openings would occur to help maintain and enhance the wildlife habitat for species that use early successional habitats.

Consistency of Proposed Activities in Alternatives 4 and 5

Due to the no new road construction in Alternatives 4 and 5, both of the savannas (35 acres each, totaling 70 acres) from the proposed action would be dropped. Without the construction of new roads from existing Forest Roads, maintenance of the two savannas would be very difficult and limited to access by off-road vehicles and/or equipment.

Alternative 1 – No Action

Under Alternative 1, current management plans would continue to guide management of the LWPA. No new vegetation, recreation, wildlife habitat improvement or transportation system treatments would be implemented with this decision to accomplish Lower Williams project goals. This alternative provides a baseline against which to describe the environmental effects (Chapter 3) of the action alternatives and responds to the concerns of those who would like no additional management activities to occur within the LWPA.

Alternative 1 would allow ecological processes to control vegetative development. Ongoing road maintenance could occur through current management direction, or other management decisions in the future.

Alternative 2 – Proposed Action

Alternative 2 addresses the purpose and need for action outlined in Chapter 1 of this document, but does not particularly address any of the issues. This alternative was created for public scoping. The interdisciplinary team used this alternative to act as a basis, along with the “No Action” Alternative, for the analysis of the other three Action Alternatives. This alternative would develop the most young forest (early successional forest) and provide for more sustainable timber and mast production (by reducing the competition between trees for light and water resources) development through 1,054 acres of regeneration harvest with residuals and 750 acres of commercial thinning. The primary harvesting method for this alternative would be conventional logging (1,542 acres) and only 262 acres would be helicopter logged.

This alternative addresses the purpose and need for action to move the project closer to the desired condition of 3-8% maintained openings, away from the existing condition of 1%. The proposed wildlife activities would create 70 acres of savanna and approximately 20 acres of wildlife openings (seeding of landings) to develop permanent openings. The landings for helicopter logging (approximately 2+ acres) are considerably larger than conventional log landings. The larger landings would create more permanent openings acres. However, Alternative 2 proposes more overall acreage of permanent openings, even though the other action alternatives propose to create more acres of landings to be converted into wildlife openings.

This alternative would have approximately 3.2 miles of new road construction (road hardening), two miles of road reconstruction. The two miles of road reconstruction would consist of road realignment, replacing and/or installing culverts, and widening of road(s).

Alternative 3 – Proposed Action Modified After Scoping

Alternative 3 is the proposed action modified to address public scoping comments (erosion and sedimentation) and internal issues (heritage resources sites, acid-sensitive soils and erosion and sedimentation). The level of harvesting on very close to that of Alternative 2 with regeneration harvest with residuals on 937 acres, commercial thinning on 670 acres, and shelterwood harvest is 38 acres. Under this alternative, the project area will move closer to the desired condition by creating young forest stands, permanent wildlife openings, and reducing competition in stands for light and water resources. This alternative will convert more acres of landings into wildlife openings (approximately 31 acres), than Alternative 2 (approximately 20 acres). Helicopter landings are approximately 1 acre; therefore, the acres converted to wildlife opening will be more in this alternative than in Alternative 2, which is primarily conventional logging. However, the savanna creation is only 35 acres (half the amount proposed in Alternative 2).

Alternative 3 addresses the scoping comments for new road construction by not proposing the reconstruction of FR 101A and building the new road extension to access regeneration Unit 23. This will reduce the rates of erosion and sedimentation to Craig Run. New road construction off of FR 735, starting outside of the project boundary to access regeneration Unit 4 would be dropped. Unit 4 would be changed to helicopter logging, or an agreement to construct a road through private property would be used for logging this unit.

This alternative would conventional log approximately 1,129 acres and helicopter log approximately 551 acres. The amount of road hardening ranges from 15 to 25 miles. Approximately 2.5 miles of road extensions would be constructed on Forest Roads. The extension off of FR 272B would be reduced to 0.98 mile, to access regeneration Units 20 and 21, and commercial thinning Unit 3. There would be approximately one to 1.5 miles of road reconstruction that exceeds just adding stone or hardening.

Alternative 4 – No New Road Construction, ½ Mile Maximum Skid Trail

Under this alternative, there would be more helicopter logging than conventional logging. This alternative was created to address the purpose and need for action and the erosion and sedimentation issue by proposing no new road construction but still using conventional logging where soil impacts would be minimal. The helicopter logging proposed in this alternative is approximately 1,163 acres and conventional logging would be 466 acres. The skidding distance would be limited to a maximum of 0.5 mile. Under this alternative, there would be 0.5 mile of road reconstruction activities that include realignment, widening, and replacing/installing new culverts. Additionally, road reconstruction that consists of just hardening (adding stone) would range from 16 miles to 30 miles. The hardening of roads is necessary to upgrade the existing roads for log trucks hauling products from the helicopter landings.

This alternative would move the project area closer to the desired condition by proposing 921 acres of regeneration harvest with residuals, 670 acres of commercial thinning, and 38 acres of shelterwood harvest. The two 35 acres savannas (with one pond for one) will not be created. This would reduce the percentage of permanent openings to improve habitat for species such as grouse, deer, and turkey. Helicopter logging requires larger landings. The log landings for helicopters can be as large as one acre in size, depending

on the terrain, and will help move the project area closer to the desired condition of 3-8% of permanent openings.

Alternative 5 – No New Road Construction, No conventional logging

Under this alternative, the Forest Service would further address sedimentation and erosion by avoiding constructing new roads and no conventional logging (not adding to or using existing skid trail systems). Alternative 5 consists entirely of helicopter logging. As stated earlier, there would be no new road construction for haul roads to access the helicopter landings, but road reconstruction change hardening would occur on approximately 23 miles of roads to appropriately accommodate the helicopter logging operations. Alternative 5 proposes to harden roads ranging from 21 miles to 28 miles.

The use of helicopter logging addresses the issue of acid sensitive soils by disturbing the soil less than 1%. The heritage sites issue would be addressed by dropping units 5 and 14, as it is proposed in Alternatives 3 and 4.

This alternative would move the project area closer to the desired condition (creating age class distribution) by implementing 924 acres of regeneration treatments with residuals. The commercial thinned acres are the same as Alternatives 3 and 4, with 670 acres.

The need to move the project area closer to the 3-8% of permanent opening would be addressed by converting the larger helicopter landings (seeding of landings) into wildlife openings.

Alternative 6 – Modified Alternative 3

This alternative is Alternative 3 modified to address the discovery of running buffalo clover (*Trifolium stoloniferum*) and nodding pogonia (*Triphora trianthophora*) in the project area. This alternative would also address any public comments received during the 45-Day Comment Period. In Alternative 3, Units 16 and 9 are proposed as regeneration harvests with residuals and conventional yarding. These units would be dropped in Alternative 6, thus reducing the acres of regeneration harvest with residuals to approximately 887 acres). Correspondingly, the acres of conventional logging would be reduced to 703 acres in this alternative, the miles of skid trails would be approximately 42 miles, four landings along FR 425 would be dropped, and the landing associated with Unit 9 would be dropped.

The conventional log landing acres would decrease by one acre to approximately eight acres and the acres for helicopter landings would decrease by three acres to 19 acres in Alternative 6. Collectively, there are approximately four less acres of log landings; thus four acres less for potential wildlife openings. This alternative would create approximately 62 acres of wildlife opening, obviously lesser acres of wildlife openings than in Alternatives 2 and 3. On the other hand, Alternative 6 would propose more acres of wildlife openings than the 32 acres in Alternative 4 and 42 acres in Alternative 5.

The road reconstruction “Hardening” proposed for FR 425 would be dropped under this alternative and the portion of road reconstruction “Hardening” of FR 133 north of FR 239

would be dropped. This would reduce the estimated range of road reconstruction “Hardening” miles to 11 – 20 miles in this Alternative 6 from 15 – 25 miles in Alternative 3.

The two miles of road reconstruction “Existing Corridor” miles (which could include road realignment, widening, installing culverts, replacing culverts with larger culverts, etc.) proposed in Alternative 3 would remain the same for Alternative 6.

Under this alternative Craig Run and Jonathan Run stream crossing, on FR 429, would be improved. Craig Run would be improved by adding grade control structures below the crossing/culvert to help create a pool of water. This pool of water would help settle out substrate material, as the water flow enters the crossing/culvert. Jonathan Run is a culvert that would be replaced with an open bottom arch or a box culvert that is counter-sunk into the substrate.

For the most part, Alternative 6 would move the project area closer to the desired condition and adequately address the issues developed from scoping and the discovery of running buffalo clover and nodding pogonia within the project area. This alternative would harvest the least amount of acres (1,595 acres) of all of the Action Alternatives, would not have any major impacts to threatened and endangered species and/or sensitive species, and would implement project(s) to improve water crossings. By implementing this alternative, the purpose and need for action, the concerns of the public, and the resource concerns would be adequately addressed.

Table 2. Comparison of Activities by Alternative						
Activity (Approximate Acres and Miles)	Alternatives*****					
	1	2	3	4	5	6
Vegetation Management						
Forest Treatments						
Regeneration Harvest w/ Residuals	0	1,054	937	921	909	887
Shelterwood Harvest (2 Harvests w/in 3-7 years)	0	38	38	38	38	38
Commercial Thinning	0	750	670	670	670	670
Total Vegetation (acres)	0	1,842	1,645	1,629	1,617	1,595
Reforestation Treatments						
Site Preparation	0	1,092	975	959	947	925
Herbicide	0	38	38	38	38	38
Advanced Grapevine Removal*	0	1,092	975	959	947	925
American Chestnut and/or Butternut Planting	0	10	10	10	10	20
Total Reforestation Treatments	0	2,944	2,631	2,598	2,574	2,540
Wildlife Management						
Forest Treatments						
Savannah Construction	0	70	35	0	0	35
Creating Wildlife Openings (acres)	0	20	31	32	42	27
Permanent Openings Created		90	66	32	42	62
Herbicide and Mowing**	0	90	66	32	42	62
Road Activities						
Road Reconstruction – Existing Corridor***	0.0	2	2	0.5	0	2
Road Reconstruction – Hardening****	0.0	4	15 – 25	16 – 30	21 – 28	11 - 20
Road Construction – New Corridor	0.0	3	2	0	0	2
Skid Trails	0.0	64	46	19	0.0	42
Log Landings						
Helicopter*****	0.0	7	22	14 – 25	27 – 42	19
Conventional	0.0	13	9	4.5 – 7	0	8

*The advance grapevine removal will be implemented as needed.

**Herbicide and mowing will be used to maintain savannas and wildlife openings.

***This road reconstruction includes installing larger culverts, road widening, to realignment of roads.

****This road reconstruction includes hardening of roads to upgrade the roads to a four season road. The mileages are in ranges due to the alternate travel routes to helicopter landing sites.

*****The helicopter landing acres for Alternatives 4 and 5 are in ranges due to the alternate travel routes during implementation.

*****Alternative 1 is the No Action and Alternative 2 is the Proposed Action.

Comparison of Alternatives

This section analyzes how each alternative responds to the LWPA issues. The original issue discussions are found in Chapter 1. Please use Table 3 for quantitative value of how each issue would be addressed in each of the alternatives.

Issue 1: This issue focuses on the disagreement with new road construction, use of existing skid trails, and adding skid trails to the system, in the LWPA. The commenter(s) suggested the building of new roads and skidding would cause more erosion and sedimentation.

- Alternative 1, the “No Action”, does not include any activities within the project area.
- Alternative 2, Proposed Action, was prepared for the scoping period, to be sent out for comment. Therefore, it does not necessarily directly address the issue.
- Alternative 3 modifies the amount of new road construction sent out for scoping by not constructing 0.71 mile of road off of FR 101-A and the 0.52 mile of road off of FR 735A. The use of existing skid trails and additional skid trails would be addressed by adding more helicopter logging.
- Alternative 4 would not build any new roads and would limit the skidding distance to 0.5 mile.
- Alternative 5 would have all helicopter logging (1,617 acres).
- Alternative 6 would further modify the amount of road reconstruction (hardening) proposed in Alternative 3 by dropping FR 425 and a portion of FR 133. The miles of skid trail trails would be reduced to 43 miles, three miles less than the 46 miles proposed in Alternative 3. The amount of log landings would be reduced to 27 acres, four acres less than Alternative 3.

Issue 2: Issue 2 focuses on the effects of proposed harvesting methods on acid-sensitive soils.

- Alternative 1 is the No Action alternative and would include no activities (wildlife, vegetation-logging, roads).
- All of the Action Alternatives (2, 3, 4, 5, and 6) would address the issue by proposing helicopter logging in areas to reduce disturbance, soil loss, and the consequent loss of base cations related to skidding.

Issue 3: Early successional habitat and permanent openings

- Under Alternative 1, there would not be any activities proposed. The project area will continue with the existing condition.
- Alternative 2 would move the project area from the existing condition of 1.1% towards the desired condition, by creating 70 acres of savannas and 20 acres of wildlife openings. Approximately 1,054 acres of regeneration harvest with residuals would be implemented under this alternative to create 0 – 20 age class and early successional habitat. This alternative meets the purpose and need better than the other action alternatives, by proposing to create more permanent openings and early successional habitat/0-20 young age class.

- Alternative 3, 4, 5, and 6 would address the issue of creating early successional habitat and 0 – 20 young age class within the project by proposing 937 acres, 921 acres, 909 acres, and 887 acres of regeneration harvest with residuals.
- Alternative 3 and 6 propose 35 acres of savanna creation and would convert 31 acres and 27 acres respectively of log landings into wildlife openings. These two alternatives are very close in how they would address this issue, differing in only an estimated four acres of opening creation.
- Alternatives 4 and 5 would create the least amount of permanent openings acres, with 32 acres of wildlife openings in Alternative 4 and 42 acres of wildlife openings in Alternative 5.

Issue 4: Threatened and Endangered Species and Sensitive Species

- Under Alternative 1, there would not be any activities proposed; therefore, the population of running buffalo clover and nodding pogonia would not be impacted. The project area will continue with the existing condition.
- Action Alternatives 2, 3, 4, and 5 would result in major impacts to a large population of running buffalo clover.
- Alternatives 2 and 3 could result in loss of viability for nodding pogonia.
- Alternative 6 will drop all proposed harvest, road maintenance, and/or hauling activities that would have any major impacts to the known populations of running buffalo clover and nodding pogonia.

Table 3. Comparison of Issues by Alternatives						
ISSUES	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
1. Effects of Erosion and Sedimentation						
Road construction - New corridor (estimated miles)	0	3	2	0	0	2
Road Reconstruction - Hardening (estimated miles)	0	4	15 – 25	16 – 30	21 – 28	11 - 20
Road Reconstruction - (estimated miles)	0	2	2	0	0	2
Conventional Logging (estimated acres)	0	1,597	1,129	466	0	1,080
Helicopter Logging (estimated acres)	0	245	551	1,163	1,617	551
2. Conventional Logging activities on acid-sensitive soils						
Percent of Project Area w/ Conventional Logging	0	11%	8%	3%	0%	8%
3. Early successional habitat and permanent openings						
Acres of Early Successional Habitat	0	1,054	937	921	909	887
Acres of Permanent Openings	0	90	66	32	42	62
4. Threatened and Endangered Species and Sensitive Species						
Acres of occupied running buffalo clover habitat impacted	0	3.9	3.9	3.9	32.9	0.0
Acres of occupied nodding pogonia habitat impacted	0	17.4	17.4	0.0	0.0	0.0

Preferred Alternative

The interdisciplinary team, together with the responsible official, considered the biological, physical, and social effects of each alternative. **Alternative 6** has been selected as the preferred alternative because it best achieves forest plan goals, meets project specific needs, and responds to the relevant issues raised by the public.

Mitigation Measures

Mitigation measures were developed to be used as part of all the action alternatives. These mitigation measures were developed to minimize, reduce, or eliminate some of the potential resource impacts from the proposed activities and maintain the environmental quality of the project area. Design criteria (Forest Standards and Guidelines customized for the Lower Williams) are listed in Appendix D. The following mitigations meet the intent of various Goals and Objectives of the Forest Plan.

Vegetation

Butternut trees will not be marked to cut. (*Ref. VE07, p. II-18*)

Vines in trees to be cut, including grapevines, may be cut prior to harvest in any harvest units. This may enhance logging safety by weakening the connection between trees to be cut and surrounding trees. (*Ref. TR21, p. II-41*)

Beech trees infested with beech bark scale should be marked to cut in thinning treatments. In clearcuts with residuals, beech trees may be left to provide snags and culls. If apparently resistant beech is discovered, these trees should not be marked to cut in any type of harvest, unless required for safety. *(Ref. VE26, p. II-20)*

No hemlock trees should be marked to cut, except for road right of way or safety reasons. *(Ref. VE26, p. II-20)*

Mechanized logging methods will be allowed, to include use of feller bunchers, forwarders, or other technologies that may be proposed, as long as the effects are similar to those analyzed in the EIS. Machinery that is not yet commonly used in the area may contribute to additional logging safety or to lower costs and thus higher revenues to the U.S. Treasury. In areas where no skid trails are to be located, logging would be permitted as a substitute for the helicopter logging method. *(Ref. TR01, p. II-40)*

Helicopter logging may be permitted in any unit that is shown as conventional logging. *(Ref. TR01, p. II-40)*

A closure order would be issued to restrict public use of National Forest lands when helicopter flights are on going. Closure areas will be large enough to include flight paths. *(Ref. RC01, p. II-32)*

A prohibition on felling, logging, and hauling during the first week of WV deer gun hunting season will be included in the timber sale contract. *(Ref. RC01, p. II-32)*

Botany/Ecology

To the extent possible, inspect off-site 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. *(Ref. VE22, p. II-20)*

Because a local source for weed-free mulch is not yet available, use straw or coconut fiber matting instead of hay mulch. *(Ref. VE20, p. II-19)*