

Chapter 2

Alternatives, including the Proposed Action

Introduction

This chapter explains how the Forest Service informed the public of the proposal and how the public responded. It also describes and compares the alternatives considered for the Lower Clover project. It includes a description and map of each action alternative considered. This section presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare alternatives is based upon the design of the alternative (i.e., regeneration harvest versus intermediate harvest) and some of the information is based upon the environmental, social, and economic effects of implementing each alternative (i.e., the amount of erosion or cost of helicopter logging versus ground-based skidding).

Alternative Development Process

A. 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 the unresolved issues, which are related to the proposed action (40 CFR 1501.7).

The Lower Clover proposal was listed in the Monongahela Schedule of Proposed Actions beginning December 2003. The project has been listed in each quarterly publication since December of 2003. Also, public input on the proposed action was solicited from Forest Service employees, members of the public, other public agencies, adjacent property owners, and organizations. Input was requested through a legal notice published in the *Parsons Advocate* on October 22, 2003. It was requested again through a legal notice published in the *Elkins Inter-Mountain* June 7, 2004, and the *Parsons Advocate* June 9, 2004. A mailing was sent at the same time to an estimated 170 interested parties. About 23 letters, e-mails, or phone contacts were received during the initial scoping process. About 15 letters, e-mails, or phone contacts were received as a result of the June 2004, 30-day comment period. Comments received during these processes were used to define issues, develop alternatives, or identify environmental effects.

B. Issues Used to Formulate Alternatives

The purpose of soliciting comments is to determine whether there are any significant issues that affect the proposed action. An issue is generally a point of discussion considered in determining the final unresolved issues. Not all issues are significant issues. Issues are significant because of the extent of their geographic distribution, the duration of their effects, or the intensity of interest or resource conflict. Once identified, the significant issues are used to formulate alternatives, prescribe mitigation measures, or analyze the environmental effects. Identified significant issues determine the scope (49 CFR 1508.25) of the environmental analysis.

The disposition of comments received during the initial scoping period and the June 2004, 30-day comment period is found in the project file. The Interdisciplinary Team (IDT) reviewed the input received and determined that no significant issues were identified. However, some people requested that alternatives to the proposed action be considered. To explore a range of alternatives and to be responsive to public desires, the two concerns identified on the following page were brought forward as issues:

Issue 1- Regeneration Harvest: The proposed action includes an estimated 380 acres of two-aged regeneration harvest. These regeneration harvests have been proposed to move towards to Forest Plan direction to create a mosaic of tree stands of various height, shape, and age within the Lower Clover project area. However, there were some who requested the Forest Service explore alternatives to regeneration harvest.

Measure: Acres of regeneration harvest

Issue 2- Herbicide Use: The proposed action includes the possibility of using herbicides in two-aged regeneration harvests to inhibit competition with hardwood regeneration. The Environmental Protection Agency (EPA) approved herbicide triclopyr and/or glyphosate would be used. Application would be supervised by a State-certified applicator. Aerial broadcast spraying would not be conducted. However, some commenters requested the Forest explore alternatives to herbicide application out of a concern for public health and safety.

Measure: Acres of herbicide application

Alternatives Considered but Eliminated from Detailed Study

The following is a summary of alternatives considered by the IDT but eliminated from detailed study, along with the rationale for dismissal.

A. Uneven-aged Management

An alternative was considered, but eliminated from detailed study, that would focus entirely on using uneven-aged management. Under this alternative, stands would be entered on a regular basis, removing individual trees scattered across the stand or small group selections. Additional treatments would then occur on a 10-15 year basis.

Soils in the Lower Clover area have moderate to severe sensitivity to ground disturbance. To protect soil and water resources, most proposed harvest units have been identified for helicopter yarding. Uneven-aged management would not support the costs of helicopter yarding because of the small volume that would be removed each entry. To treat these areas with uneven-aged silviculture, additional roads would have to be constructed to use conventional ground-based skidding. The use of conventional ground skidding on a 10-15 year basis would cause ground disturbance at regular intervals, therefore creating repeated disturbance to the soils.

In addition, using uneven-aged management would not move the project area toward desired age class or forest type 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. 127). Uneven-aged management, over the long term, would lead to less species diversity, favoring shade tolerant species; shade intolerant oak species, cherry, and poplar currently in the overstory and understory would not be able to compete with shade tolerant beech and maple that are growing in the understory.

Prescribed Fire

The use of prescribed fire to inhibit competition with hardwood regeneration was considered. This alternative was dropped from consideration because it was not clear fire would meet the objectives for the Lower Clover project area, and herbicide treatment is a proven method. Fire would likely have required multiple burns over a period of time. Fire would likely kill oak seedlings with less than ¼ inch root collar diameter and kill 40 percent of the acorns in the area (Auchmoody and Smith 1993). This would likely inhibit successful regeneration of desired species.

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.

A. Alternative A - No Action

The National Environmental Policy Act (NEPA) requires an EA include a “no action” alternative to serve as a baseline to compare action alternatives. The no action alternative is based on the premise that ecosystems change, even in the absence of active management. It is essentially the “status quo” strategy that allows current activities and policies, such as road and wildlife maintenance and fire suppression to continue. The alternative provides the decision-maker with a clearer basis for a reasoned choice among the alternatives studied in detail.

B. Alternative B- Proposed Action

The proposed action for the Lower Clover project area focuses on vegetation management to meet the purpose and need of creating a mosaic of tree stands that move the area towards meeting size class goals identified in the Forest Plan. The proposed action includes about 380 acres of two-aged regeneration harvest and 109 acres of commercial thinning:

- Two-Aged Regeneration Harvest: This even-aged silvicultural system would create a forest stand with two distinct age classes. One age class would be the newly established and developing regeneration and the older age class would be remnants from the original stand's overstory. In Lower Clover, clumps of the original stand (1/3 acre or larger) would be retained; scattered overstory trees also would be retained such as shagbark hickory, den trees, and snags. Removal of most of the overstory would allow light to reach the forest floor and aid in the development of existing desired seedlings of light demanding species such as oaks, yellow poplar, white ash, and black cherry.
- Thinning/Stand Improvement: This harvest method would reduce the stand density including recovering and utilizing trees that would potentially die and improving stand species composition, thereby promoting growth on the most desired trees in the stand. Trees removed first would be generally poor quality, diseased or defective, high risk, and mature.

In total, an estimated 489 acres would be harvested via commercial timber sales. The estimated volume of timber that may be removed is 6317 CCF, or 3.8 MMBF.

Approximately 145 acres would be harvested using conventional ground-based skidding, while 344 acres would be harvested via helicopter yarding.

Map B and Table 2-1 on the following pages identify the activities that would occur in each stand proposed for harvest.

Alternative B Map

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Table 2-1: Summary of activities that may be implemented under Alternative B*.

Compartment 15				Compartment 20			
Stand	Acres	Logging Method	Treatment	Stand	Acres	Logging Method	Treatment
15	25	H	TA, HB, SP	14.1	11	H	TA, HB, SP
23	25	H	TA, HB, SP	14.2	21	H	TA, HB, SP
31,34	25	C	TA, HB, SP	14.3	7	C	TA, HB, SP, P,F
47	78	C	TH	16	11	C	TH
54	17	H	TA, HB, SP	17	11	C	TH
55	10	H	TA, SP	26, 29.3	25	H	TA, HB, SP
59	17	H	TA, HB, SP	29.1	14	H	TA, SP
Compartment 19				29.2	6	H	TA, SP, P,F
3,54	25	H	TA, HB, SP	37	9	H	TA, HB, SP
9	9	H	TH	45	11	H	TA, HB, SP
8	25	H	TA, HB, SP	49	6	C	TA, HB, SP, P,F
10	25	H	TA, HB, SP	57	7	C	TA, HB, SP, P ,F
17.1	10	H	TA, HB, SP	61, 62	24	H	TA, HB, SP
17.2	25	H	TA, HB, SP				
21	10	H	TA, SP				

* Figures provided in this table should be considered approximations.

H= Helicopter Yarding

C= Conventional Ground Skidding

TA= Two-Aged Harvest

TH= Thinning

HB= Herbicide Use

SP= Site Preparation

P= Planting

F= Fencing

As Table 2-1 indicates, the following activities may be implemented within regeneration units:

- **Herbicide Use:** Herbicide use is identified in most proposed two-aged harvest harvested stands to inhibit competition with hardwood regeneration. The EPA approved herbicide triclopyr would be applied to individual trees by using either a backpack sprayer or a hatchet and squirt bottle. The EPA approved herbicide glyphosate would be applied to fern by using a backpack sprayer. All treatments would follow label guidelines and would be supervised by a State-certified applicator. There would be no mechanized equipment or aerial broadcast spraying used.

- Site Preparation: Site preparation is a post harvest operation that would be implemented after the regeneration cuts. Undesirable stems from 1 inch upward to 10 inches DBH (diameter breast height) would be cut down, thereby decreasing competition to the developing desirable regeneration.
- Planting: Planting may be proposed in some stands to improve species diversity if monitoring indicates a need. For this proposal, red oak and disease resistant American chestnut would potentially be planted in some of the proposed two-aged harvests. The stand would be monitored for regeneration success and species diversity after harvest to ensure that planting is actually needed.
- Fencing: Fencing may be proposed in some stands to protect regeneration from deer browse if monitoring indicates it is warranted to ensure regeneration. The fencing would be constructed of woven-wire materials about 8 feet in height. The fence would remain in place for as long as 5-7 years, depending on the amount of time it takes for the regeneration to become established to the point of survival from deer browse. The stand would be monitored after harvest to ensure fencing is actually needed before construction of the fencing.

About eight helicopter landings may be created on National Forest System lands. All of them are proposed in locations that would minimize or avoid impacts to riparian and aquatic habitat (Alternative B map).

The following road management would occur to support harvesting activities (Alternative B map and Table 2-2):

- About five miles of road improvements. Besides the typical maintenance they receive, FR 767, 767B, and 859 may receive additional stone, additional culverts, and/or larger culverts, as needed, to support log truck traffic.
- About one mile of temporary road construction and reconstruction. Temporary roads may be constructed or reconstructed to access stand 17 of Compartment 20 and landings off FR 767, WV 38, SR 21, and FR 859. Once timber sale activity is complete, these roads would be revegetated, and boulders, earthen mounds, and/or gates would be used to block motorized traffic.
- About 0.5 miles of road construction, less than one mile of road reconstruction, and about 0.5 miles of road abandonment would be completed on TR 125.

TR 125 is an old road that accesses the eastern portion of the Lower Clover project area. It is not currently maintained as part of the National Forest Transportation System. Its existing intersection with State Route 72 does not meet State safety standards for stopping distances; if it were used by log trucks, travelers on State Route 72 may not be able to see log trucks exiting TR 125 soon enough to stop. Portions of TR 125 are steep, and some soil erosion is occurring. Portions of the road are within the riparian area of streams, thus soil from TR 125 may be entering the adjacent stream.

To address these issues and access proposed units in the eastern portion of the project area, the following would be implemented: (1) the existing intersection of TR 125 and Hwy 72 would be eliminated, and about half a mile of TR 125 would be abandoned. Work would be implemented to stop existing erosion, prevent vehicular traffic, and encourage vegetation to grow up on the abandoned section of road. (2) A new

intersection with SR 72 would be created; about half a mile of new road would be reconstructed; and about one mile of TR 125 would be reconstructed. These sections of road would allow easy access by high clearance vehicles and would be made part of the Forest's Transportation System. The new intersection would provide greater sight distances for SR 72 travelers, which would address safety concerns. The new construction and reconstruction would run along gentler grades and would reduce the potential for soil erosion and stream sedimentation effects. A gate would be installed at the new intersection to block public vehicle traffic and prevent disturbance to wildlife.

Table 2-2: Approximate miles of road affected by Alternative B*.

Road Number	Existing Length	Improvements	Construction	Reconstruction	Abandonment	Current Public Access
FR 767	3.6	3	0	0	0	1.7
FR767B	1.4	<1	0	0	0	0
FR 859	3.6	1	0	0	0	0
Temp Road to C 20, stand 17	0	0	0	0.5	0	0
Temp Road off FR 767	0	0	0	0.2	0	0
Temp road off WV 38	0	0	0.1	0	0	0
Temp road off SR 21	0	0	0	<0.1	0	0
Temp road off FR 859	0	0	0	<0.1	0	0
TR 125	1.4	0	0.5	0.8	0.5	0
Totals	10	5	0.6	1.7	0.5	1.7

* Figures are approximations. All distances are estimates based on Geographic Information System calculations.

Current activities and policies, such as routine road maintenance and fire suppression would continue under this alternative. Implementation of the proposed action would follow all Forest Plan standards and guidelines. In addition, the Forest Hydrologist conducted a site-specific field review of the project and identified riparian management guidelines to be used for this project that go beyond what is required in the Forest Plan. These guidelines are located in Appendix A.

Reasonably Foreseeable Connected Action

Besides the NFS lands that may be used for log landings and roads (Alternative B map), the Forest may seek an agreement to develop log landings and use roads on private lands in the vicinity. The exact location and number of such landings and roads have not been identified, since no such agreement has been acquired at this time. It's possible two or three landings and about 1-2 miles of existing road on private lands could be used.

C. Alternative C

Alternative C was developed to address public requests for an alternative that includes no regeneration harvest and no herbicide use, described as issue 1 and issue 2 earlier in this chapter.

To address the issue related to regeneration harvest, stands were reviewed to determine if they could be treated with a commercial thinning. Some stands were dropped because the stand composition would not lend itself to a successful thinning treatment. Others were dropped because the amount of volume that would be removed would not economically support helicopter yarding.

The sizes of the thinning treatments were also reviewed. The Forest Plan limits regeneration harvests to 25 acres. Those stands that had an acceptable species and size composition were reviewed across the entire stand, as opposed to the 25 acres that were considered for regeneration harvest. Stand acres proposed for thinning were then altered as appropriate.

As a result of the review, Alternative C includes 469 acres of commercial thinning. A map of Alternative C is found on the next page. Table 2-3 identifies the activities that would occur in each stand proposed for harvest in Alternative C.

Table 2-3: Summary of activities that may be implemented under Alternative C*.

Compartment 15				Compartment 20			
Stand	Acres	Logging Method	Treatment	Stand	Acres	Logging Method	Treatment
15	25	H	TH	14.1	11	H	TH
23	42	H	TH	14.2	21	H	TH
34	11	C	TH	14.4	6	H	TH
47	78	C	TH	16	11	C	TH
54	17	H	TH	17	11	C	TH
55	10	H	TH	26	33	H	TH
59	17	H	TH	37	9	H	TH
Compartment 19				45	11	H	TH
9	9	H	TH	49	6	C	TH
10.1	50	H	TH	57	7	C	TH
10.2	26	H	TH	62	12	H	TH
17.1	10	H	TH				
17.2	26	H	TH				
21	10	H	TH				

* Figures provided are approximations.

H= Helicopter Yarding

TH= Thinning

C= Conventional Ground Skidding

As Table 2-3 indicates, approximately 345 acres would use helicopter yarding, while 124 acres would use conventional ground-based skidding. It is estimated that 2667 CCF, or 1.6 MMBF, of timber would be removed.

No herbicide use, site preparation, fencing, or planting would occur in this alternative.

Log landing, road management activities, and riparian management guidelines would be the same as Alternative B.

Alternative C Map

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Mitigation & Design Features Common to Alternatives B & C

The following are mitigations or design features that would be implemented under Alternatives B and C.

SOILS

1. All log/helicopter landings and skid trails would be revegetated by the necessary measures to establish successful vegetation. Invasive species would not be favored for revegetation. Lime, fertilizer, and mulch would be added in critical areas as identified in the Timber Sale contract and where needed to promote growth of vegetation and/or control erosion and sediment in water.
2. Rock would be added to landing i to harden the soil surface because the soil types that would be affected by this landing have little to no rock fragments in the subsoil.
3. Rock would be added to other landings and roads, as needed during operation, to support logging equipment, tractor/trailer, and helicopter use and ensure soil strength and stability when soils are saturated.
4. Roads and landings would be maintained, as needed, to drain water off their surfaces.
5. A well planned skid trail design would be made prior to harvest to minimize the amount of ground disturbance in conventional, ground-based units. Skid trails would be placed at a distance apart so that soil disturbance would not exceed 15 percent of the total area within a harvest unit (the Regional standard for soil disturbance in an activity area or unit). Skid trails would not be steeper than 15 percent with the exception of short, steep segments not to exceed 20 percent (FP, Appendix M-15).
6. Skid trails would be monitored closely during wintertime operations, and activities would be stopped if signs of thawing occur because this would make them more susceptible to adverse soil and water resource damage.
7. No new skid roads will be constructed on slopes greater than 50 percent.
8. Skidding and hauling operations may be suspended during periods of wet soil (Forest Plan, p. 75, 2430, VI, A, #9). Efforts would be made to construct and reconstruct roads during drier periods of the year (which is normally between May and October, although it depends on climate changes and precipitation levels) (Forest Plan, p. 75). The risk for detrimental soil degradation, soil erosion, and sediment delivery to streams is high outside of the normal operating season because of the potential to possibly operate on wet soils.
9. All seeding would occur on specified roads prior to October 16. Vegetation does not grow well after this period nor does it have the ability to establish a well-formed network of roots to hold soil material in place. If hard freeze occurs prior to October 16, mulch would be used instead of seeding and annual grain would be used.
10. If road work cannot be completed within the normal operating season, and if stone and water control structures cannot be put in place, mulch would be applied heavily to the soil at a minimum rate of 1.5 tons to 2 tons per acre of straw to reduce the potential for adverse erosion and sedimentation effects (Forest Plan, Appendix S p. S-11). If a different material is used for mulching, the Forest Plan or specialist would be consulted. The effects of not doing this could be adverse for soil loss (erosion) from the site and to the water resource.

11. Mitigation for road abandonment may include pulling fill slope material back into the existing roadbed to create an outslope necessary to alleviate concerns for water channeling, surface erosion, and fill failure. Water bars would be installed where outsloping may not adequately address these concerns. Disturbed areas would be seeded and mulched according to contract specifications.
12. The intersection at TR 125 may receive more than 4 inches of stone to prevent adverse soil erosion and stream sedimentation (implemented in the design). Monitoring would be conducted and additional stone added, as appropriate, to help stabilize the entrance and keep water from ponding on the road surface.
13. Ditching and culverts would be placed for TR 125 to handle the intermittent flows that currently occur where the road starts on State Route 72 to where it crosses the colluvial soil material. (This has been accounted for in the design).
14. The road design for TR 125 would account for the water tables that appear to rise and fall with precipitation events. This has been done by creating drainage on both sides of the road at the entrance. Along the extent of the reconstruction of this road, the existing roadbed may receive additional aggregate in the concave areas of the landscape. Anything less would cause more maintenance and down time. (This has been accounted for in the design.)
15. Any snow removal required during wintertime use of roads would adhere to CT5.42 – snow removal provision.
16. Rock would be added to roads used for winter time hauling to prevent operating on wet soils (Forest Plan, p. 75.) to reduce the chance of rutting and to improve the road's ability to withstand the impact of heavy logging trucks hauling timber.
17. Slash material would be scattered along perimeters to provide wildlife habitat and catch any eroded soil.
18. To improve roads to a standard for operation outside the normal operating seasons, roads would be wider and have a thicker surface of aggregate; or, roads would be used in their existing condition and additional stone would be added to areas of known problems. Problem areas are those where water is ponding on the road; surface stone has been lost through erosion or by sinking into the sub grade and/or aggregate is not adequate in depth to protect the sub grade and integrity of the road. Areas where excessive erosion occurs and areas where the base is too soft to support potentially heavy loads may receive a minimum of 6 inches of aggregate. (All of this is accounted for in the road design package and based on soil engineering analyses.)
19. Temperatures and site conditions would be monitored, especially on south facing slopes, since winter time freeze thaw cycles happen very quickly in this area of the MNF.
20. Current skid trails in Compartment 20 stand 16 may be reutilized in the harvesting of this unit. Skid trail location and construction guidelines in the Forest Supplement to the FSM would be followed (Appendix M) to establish a well planned skid trail design. Skid trails would be designed to adhere to ground conditions.

WATER RESOURCES

1. Riparian resources of all perennial, intermittent and ephemeral streams would be protected by applying the measures identified in Appendix A.
2. Skid roads and log landings would be located to minimize soil and filter strip disturbance, avoid or limit the number of functioning stream channel crossings, utilize existing old skid routes, and avoid the steeper and wetter areas within the units to the maximum extent practical.
3. In conventional harvest units, overland skidding would be used wherever practical, especially in those areas of the more gentle terrain when soil and wetness conditions will support it. This would help avoid or minimize soil compaction and possible sediment delivery to streams that can result from the construction of bladed skid roads.
4. Temporary roads and skid roads would be promptly closed and rehabilitated prior to final acceptance for the harvest units they serve. Rehabilitation actions include installing drainage dips (water bars and dips), removal of structures such as culverts and temporary bridges, channel restoration at crossings, decompaction, out sloping, and revegetation by seeding and mulching. These measures would help stabilize soil, disperse surface runoff, and reduce the potential for sediment and storm flow effects.
5. The Normal Operating Season specified in the timber sale contract would be from May 1 to November 15.
6. Timber activities (skidding and log hauling) outside the normal operating season in the timber contract (winter operations) would be closely administered to limit or control activities that may damage roads and soil to those times and conditions when damaging amounts of erosion and sedimentation would not occur, or can otherwise be effectively controlled. Response to any developing road problems may include additional spot stone in the problem areas, other road maintenance such as grading and cleaning drainage structures, and sale shutdown until suitable conditions are obtained.
7. All conventional logging units would only be harvested during the Normal Operating Season in the timber sale contract (May 1 to November 15).
8. Road maintenance would occur as soon as possible and practical, when rutting or other road damage occurs as a result of the timber harvesting activities. This may include the placement of additional stone surfacing, grading, cleaning drainage structures, and other measures as necessary to protect the road, and minimize soil erosion and sedimentation.
9. An old truck road to stand 17 in compartment 20 would be used as a temporary truck road (rather than a skid route), with timber yarded to the old landing in stand 17 rather than yarding it to C-20 stand 1. This temporary road would be managed and improved to handle the log truck traffic. Mitigation would include improved and additional drainage structures (dips and/or culverts), grading, spot surfacing with stone in the dips, wet spots and areas prone to rutting, and suspension of hauling when soils are too wet to support the truck traffic.
10. Helicopter landings would incorporate soil mitigations, including surface hardening where needed.
11. Helicopter service landings would implement and follow all requirements of State regulations pertaining to protection against spills of hazardous substances, and response to accidental spills.

AQUATIC RESOURCES

1. Potential adverse effects to riparian resources from timber harvesting along stream channels would be mitigated by staying away from the larger streams and implementing the site-specific riparian management guidelines identified in Appendix A. Also, see items identified for soil and watershed resources.

OLD GROWTH

1. Old growth stands that were designated during a previous analysis would continue to be protected from active management.

HERITAGE RESOURCES

1. All sites described as being eligible to the NRHP or unevaluated, and which are near or adjacent to logging activities (Sites 01-065, 01-208, and 01-203), would be marked with white paint and avoided during all phases of project implementation. (This has already been done). If tree felling occurs adjacent to these resources, either directional felling away from the site would be implemented, or a buffer comprising the height of the nearest possible fell, plus one-half, would be established.
2. The service landing planned north of and adjacent to Site 01-203, next to the intersection of WV 38 and CR 21, would be placed off of and as far north and away from the site as possible. (This has already been accounted for in the road design). Ingress and egress to and from the landing would take place outside of the small cemetery adjacent to the road, and no project traffic, apart from that on the modern roadway already constructed through the site, would take place within the site's boundaries. The boundaries of the site would be marked with white paint prior to project implementation.
3. If additional cultural resources are encountered during project implementation, work in that portion of the project area would cease, and the Forest Archaeologist would be contacted.

RECREATION

1. To ensure public safety, road traffic would be stopped briefly as helicopters fly trees over roads. Public use would be prohibited in regeneration and thinning units while tree felling and helicopter operations are occurring.
2. If fences are installed, they would be removed once successful regeneration was ensured; this would restore public access to these areas.
3. The dispersed campsite along WV-21 would be closed to public use during helicopter logging operations. Signs would be posted closing off the timber sale area to public use during felling and flying operations during helicopter logging.

SCENERY

1. Helicopter/log landings located in fore-ground (like proposed site "c") would be scarified, seeded, mulched, and debris would be removed to reduce long term visual impacts.

WILDLIFE

1. Leave all tree tops and slash scattered throughout harvest units. Retain culls, snags, and den trees in accordance with Forest Plan standards and guidelines.

Mitigation & Design Features to Be Implemented Only Under Alternative B

The following are mitigations or design features that would be implemented only under Alternative B.

HERBICIDE USE

1. Herbicide treatments would follow all applicable federal and state laws and regulations and Forest Plan standards and guidelines.
2. Applications would be supervised by a State-certified applicator.
3. No mechanized equipment or aerial broadcast spray methods would be used. Only hand application would be used.

Discussion:

4. Riparian “No Programmed Harvest” areas, outlined in Appendix A, along all perennial, intermittent, and ephemeral stream channels would not be treated with herbicides. Herbicide application would not be closer than 50 feet (100 feet where slopes exceed 30%) adjacent to all bodies of free or flowing surface water.
5. Application equipment, empty herbicide containers, clothes worn during treatment, and skin would not be cleaned in open water or wells.
6. Mixing and cleaning water would come from a public water supply and be transported in separate labeled containers.
7. Herbicide mixing, loading, or cleaning areas in the field would not be located within 200 feet of private land, open water or wells, or other sensitive areas.
8. Areas to be treated with herbicide would be signed for foot travel at access points.
9. Herbicides would be applied at the lowest rate effective in meeting project objectives. Application rate and work time would not exceed typical levels.
10. In regenerated cuts, should grapevine seedlings or sprouts develop, two to four clumps per 20 acres would be retained following the cut.

PLANTING

1. To encourage seedling growth in stands proposed for planting red oak and/or disease resistant American chestnut seedlings, plantings would not occur under canopies of residual trees. Tree shelters would protect seedlings from deer browse plus act as greenhouses, allowing seedlings to outgrow competitive tree species. Shading by residual trees would reduce seedlings ability to survive and grow.

SITE PREPARATION FOR NATURAL REGENERATION

1. There would be no site preparation within the designated riparian area width.

Comparison of Alternatives

The following table summarizes the activities that may be implemented under each of the Lower Clover alternatives.

Table 2-4: Summary of Lower Clover Alternatives' Actions *

Activity	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C
Two-aged regeneration harvest	0 ac	380 ac	0 ac
Commercial thinning	0 ac	109 ac	469 ac
Herbicide use	0 ac	Up to 380 acres	0 ac
Site preparation with hand tools	0 ac	Up to 380 acres	0 ac
Planting	No	Yes**	No
Fencing	No	Yes**	No
Total acres harvested	0 ac	489 ac	469 ac
Timber volume removed	0 CCF	6317 CCF (3.8 MMBF)	2667 CCF (1.6 MMBF)
Conventional ground-based skidding	0 ac	145 ac	124 ac
Helicopter yarding	0 ac	344 ac	345 ac
Potential helicopter landings	0 landings	8 landings	8 landings
Road improvements on FR 767, 767B, and 859	0 mi	5 mi	5 mi
Construction and reconstruction of temporary roads to stand 17 of Compartment 20 and to possible landings off FR 767, WV 38, SR 21, and FR 859	0 mi	1 mi	1 mi
Construction on road TR 125	0 mi	0.5 mi	0.5 mi
Reconstruction on road TR 125	0 mi	0.8 mi	0.8 mi
Road abandonment on road TR 125	0 mi	0.5 mi	0.5 mi

* Figures provided in this table are approximations.

** Planting and fencing may be implemented if post-harvest monitoring indicates a need for such action to ensure successful regeneration.

The following is a summary of how the alternatives differ in regard to both their resource impacts (Chapter 3) and their achievement of project objectives (Chapter 1).

Table 2-5: Comparison of the Lower Clover alternatives’ effect to resources and achievement of project objectives.

Potential Impacts to Resources	(No Action) Alternative A	(Proposed Action) Alternative B	Alternative C	Notes
Air Quality				
None of the alternatives are expected to noticeably affect air quality in the area.				Air quality report
Soils				
Alternative A would not implement actions that would cause adverse impacts, but existing erosion on TR 125 would continue. Alternative B and C would implement activities that would disturb soils, which may cause adverse compaction, erosion, nutrient removal, and adversely affect soil productivity. However, such effects are not expected to be substantial. Less than one percent of the project area and less than 0.5 percent of the Clover Run watershed would be affected. Implementing Forest Plan direction and design features and mitigation identified in Chapter 2 and Appendix A would reduce the potential for adverse impacts. Neither action alternative would contribute substantially to the effects of past, present, or foreseeable future actions.				
Hydrology/Water				
<p>Of the action alternatives, Alternative B would have the greatest potential for water quality and storm flow and peak flow effects because it would use regeneration harvest, whereas Alternative C would not. Alternative B would treat a small percentage of the total project area (approximately 5 percent) and a much smaller proportion of the total watershed area. New road construction would be limited, and existing road drainage would be improved with additional stone surfacing, grading, new or replaced culverts and other measures. The potential for adverse effects to the general public and aquatic biota downstream of herbicide treatments would be so slight as to have no measurable cumulative effect.</p> <p>Alternative C would affect the same percentage of the project area and watershed that as Alternative B. Alternative C would not use herbicides, so there would be no potential for herbicide effects to humans or aquatic biota downstream.</p> <p>There are no acres of coastal zone areas in the project area , so all alternatives would be consistent with 16 USC 1451 et seq. Floodplains and wetlands exist in the area, but they would not be adversely affected by any of the alternatives, thus alternatives would be consistent with EO 11988; 10 CFR 1022 and EO 11990; 10 CFR 1022.</p>				

Potential Impacts to Resources	(No Action) Alternative A	(Proposed Action) Alternative B	Alternative C	Notes
Aquatics				
None of the alternatives are expected to noticeably affect aquatic resources in the Lower Clover project area or impact species occurrence or viability.				
Impacts to riparian habitat of perennial streams	0	0	0	
Impacts to riparian habitat of non-perennial streams	None	No substantial effect, nearly the same as Alternative C	No substantial effect, nearly the same as Alternative B	
Impacts to the recruitment of large woody debris to streams through natural processes	0	No substantial effect, nearly the same as Alternative C	No substantial effect, nearly the same as Alternative B	
Sediment effects	0	Minor, slightly more than Alternative C	Minor, slightly less than Alternative B	
Viability of fish and aquatic organisms	Maintained	Maintained	Maintained	
Vegetation				
Alternative A would not implement actions that would modify the area's existing size class, age class, or forest type diversity. Alternative B would increase the seedling/sapling size class by 7%, and reduce the saw timber size class the same amount. It would also increase the 0-15 age class by 380 acres (increase of 7%). Alternative B would not noticeably affect the open brush size class, change the pole size class, or modify the area's existing forest type distribution. Alternative C would implement thinnings, but this activity would not change the area's existing size class, age class, or forest type distribution.				
Seedling/Sapling on NFS lands in the project area	9.7%	17%	9.7%	DFC = 10-20%
Pole Timber on NFS lands in the project area	3.3%	3.3%	3.3%	DFC = 15-30%
Saw Timber on NFS lands in the project area	86.4%	79.1%	86.4%	DFC = 50-75%
0-15 Age Class	3.6%	10.8%	3.6%	

Potential Impacts to Resources	(No Action) Alternative A	(Proposed Action) Alternative B	Alternative C	Notes
Change to existing forest types	No	No	No	
Old Growth/Mature Habitat				
None of the alternatives would affect existing designated old growth. Alternative A and C would not regenerate any mature stands 120+ years old. Alternative B would regenerate 27 acres.				
Acres of designated old growth in the project area	331 ac	331 ac	331 ac	
Acres of mature habitat in the project area	1,054 ac	1,027 ac	1,054 ac	
Economic				
Alternative A would not generate new income. Alternative B would generate the most income or have the least deficit, depending on the value of the highest bid and whether roads and vegetation management activities are factored into the costs. Alternative C would, most likely, be a below cost sale if road costs are factored in and not amortized.				
Monetary return if <u>road costs are not included</u> and bid is between the allowable minimum bid and the average bid on MNF sales in the last five years	0	\$397,600 to \$1,220,200	\$116,900 to \$464,200	
Monetary return if <u>road costs are included</u> and bid is between the allowable minimum bid and the average bid on MNF sales in the last five years	0	(-\$71,100 to \$751,000	(-\$352,000 to (-\$4,600	
Additional cost if vegetation control with herbicide, vine control, planting, and fencing is implemented	0	104,000	0	
Environmental Justice				
Effects to Minority and low-income populations [EO 12898]	No	No	No	
Heritage Resource				
None of the alternatives would adversely affect known heritage resources in the project area. Mitigation is identified earlier in this chapter to protect sites should new sites be discovered during implementation. Thus all alternatives would be consistent with heritage protection laws and EO 11593.				

Potential Impacts to Resources	(No Action) Alternative A	(Proposed Action) Alternative B	Alternative C	Notes
Existence of Native American concerns [EO 13007]	No	No	No	Heritage Report
Number of historic, archeological, or architectural resources affected (including sites on or eligible for the National Register of Historic Places and the National Registry of Natural Landmarks) [EO 11593]	0	0	0	
Recreation				
None of the alternatives are expected to noticeably affect recreation opportunities, recreation facilities, or access in the area.				
Number of developed sites impacted	0	0	0	
Number of dispersed sites impacted	0	0	0	
Anticipated change in recreation use levels	No	No	No	
Impacts to trails (American Discovery Trail)	No	No	No	
Impacts to Areas of recreational importance (American Discovery Trail)	No	No	No	
Miles of changed public motorized access	0	0	0	
Scenery				
Adverse effects on the overall ROS or Scenic Attractiveness	No	No	No	
Unique Areas				
Acres of Prime or Unique Farmland affected [7 USC 4201]	0	1.5	1.5	
Acres of State or national parks, conservation areas, or other areas of ecological, scenic, or aesthetic importance	0	0	0	

Potential Impacts to Resources	(No Action) Alternative A	(Proposed Action) Alternative B	Alternative C	Notes
Wilderness/Special Area				
There is no Wilderness within or adjacent to the Lower Clover project area.				
Acres of Wilderness affected	0	0	0	
Acres of special areas affected	0	0	0	
Wild and Scenic River				
There are no Wild and Scenic Rivers that would be affected by Lower Clover activities.				
Miles of Wild and Scenic River affected [16 USC 1271]	0	0	0	
Achievement of Project Objectives				
Increase the percentages of younger age classes in the Lower Clover project area	No	Yes	No	
Removes low quality, poorly formed, and diseased trees, allowing the remaining healthy, well-formed trees to grow larger.	No	Yes	Yes	