

Chapter 2 – Alternatives Considered

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 Cherry River 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 Cherry River proposal was listed in the Monongahela National Forest website under Forest Planning, Schedule of Proposed Actions beginning February 2003. The project has been listed in each quarterly publication since then. It was listed on the same website, under Proposed Actions, since February, 2005. 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 *Nicholas Chronicle* on February 10, 2005. A news release was also published in the same paper, and in the *Webster Echo* and the *Webster Republican*. A mailing was sent at the same time to an estimated 300 potentially interested parties. About 23 letters, e-mails, or phone contacts were received during the initial scoping process. 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 is found in the project file. The Interdisciplinary Team (IDT) reviewed the input received from interested individuals, organizations, adjacent landowners, and other agencies and identified three issues that helped to develop an alternative to the proposed action. Other issues helped to determine site specific mitigations, or changes that could be made to the proposed action. To explore a range of alternatives and to be responsive to public desires, the three concerns identified on the following page were brought forward as issues:

Issue 1: Soil Productivity/Soil Quality

Background: Soil productivity impacts from heavy equipment in the Proposed Action occur primarily through the construction and use of skid roads and the construction of temporary landings. These activities would cause soil compaction and displacement of topsoil. Soil compaction hampers root growth, reduces soil aeration, inhibits soil water movement, and may lead to rutting and puddling. Soil permeability and water infiltration would also be reduced. Displacement of topsoil removes the nutrient rich surface soil. Compaction and soil displacement would reduce soil productivity and inhibit the growth of vegetation, especially in areas of wet soils. A total of about 1500 acres would be logged using conventional skidding methods.

Acid deposition from air pollution in rainfall can result in less base cation availability for tree growth and increased stream acidity. Base cations of concern are primarily the nutrients calcium and magnesium. The soils occurring in the project area are rated as being sensitive to acidification because they are already low in base cations and high in acidity. Trees store nutrients in the trunks, roots, limbs and leaves. Harvesting trees removes some of those nutrients from the site. The majority of nutrients would stay on site if limbs, leaves, and roots were left behind during harvesting. Soil erosion can also remove base cations from the site.

Building and using roads and landings would cause compaction and topsoil displacement.

Issue: The Proposed Action may result in reduced soil productivity through compaction and displacement of soil from conventional logging. Harvesting trees may remove more base cations from the site than can be replenished through natural processes, given the amount of acid deposition and the soil types that occur in the area. This might eventually result in depletion of the soil reserve of base cations with further soil and stream acidification effects.

The following unit of measure is used in this EA to evaluate this issue:

- Percent of soil disturbance at various land unit scales.
- Acres of disturbed soils.

Issue 2: Soil Erosion and Stream Sedimentation

Background: The onsite effects of logging would result in more sediment available for transport to stream channels and faster transport. Altered patterns of runoff created by roads, skid roads, landings and tree harvest would result in channel headcutting, new channel cutting, erosion of soil, and faster rates of runoff. Such effects would cause sediment to be carried in runoff to nearby streams. Increased sediment loads in streams that already have high sediment levels would adversely affect in-stream habitat for trout and other aquatic biota in Coal Siding Run, Curtin Run, Morris Creek, Buckheart Run, Holcomb Run, and the Cherry River.

Soil erosion and sedimentation would result from the Proposed Action because of the amount and intensity of earth disturbance, wet soils, steep slopes, and proximity of activities to stream channels.

Issue: Because some areas have been identified within the project area as being more at risk for soil erosion effects due to soil type, slope, and proximity to stream channels, the proposed action may increase erosion and stream sedimentation and impact trout and other aquatic biota. The following units of measure are used in this EA to evaluate this issue:

- Acres of exposed soils
- Acres of conventional harvest, by prescription, on slopes over 40%, on wet soils, in coves, and in riparian areas
- Miles of road construction, reconstruction, improvements, and decommissioning
- Miles of roads open, with restricted use or in storage.
- Number of channel crossings by roads and skid roads
- Percent of watershed harvested, and percent logged conventionally

Issue 3: Oak regeneration

Clearcut harvest methods in oak stands in the proposed action would not be optimum for regenerating oak stands, in spite of the presence of oak advance regeneration. Clearcut harvest would be expected to regenerate diverse mixed hardwood stands with an oak component. Oak is a desired species for mast production for wildlife. Seedlings already present in the understory would not be large enough or plentiful enough to become dominant following clearcutting. Interfering vegetation, such as ferns and understory maples would be dense enough to prevent adequate growth of oaks following clearcutting. Deer browse impacts, currently low to moderate, could also affect oak regeneration.

Young stands created by clearcutting within the project area within the last ten years currently have healthy oak trees, but faster growing trees such as yellow poplar and fire cherry are beginning to overtop the oaks, and will soon result in less oak in these stands. Stands proposed for regeneration harvests in the proposed action are expected to produce similar results to the current condition of these young stands.

Comments received during scoping suggest that planting and tubing of oaks could be used to ensure oak regeneration. Other techniques could also be used to help ensure oak regeneration, such as herbicides to reduce competition with grapevines, ferns, and understory maples; fencing to eliminate deer impacts; shelterwood harvests to give oak seedlings more time and light to become competitive; opening areas to additional deer hunting; fencing individual clumps of trees; and concentrating regenerated areas in time and space to reduce deer impacts.

Issue: Oak species composition would be unlikely to be maintained by the clearcutting in the proposed action.

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

- Acres regenerated with over 50% oak
- Acres of cultural treatments to enhance oak regeneration

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, in all prospective harvest units, or the entire project area. 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.

The Forest Plan (p. 134) states that “evenaged management will be used when intolerant vegetation is the species objective”. Using uneven-aged management over the entire area would not move the project area toward desired age class or forest type diversity. Uneven-aged management would not move towards a mosaic of tree stands of various heights, shapes, and ages 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, which in this area would be striped maple (a shrub species) and red and sugar maples. The current diversity of overstory tree species consists mostly of shade intolerant oak, poplar and a variety of shade tolerant and intolerant species. Only a few stands have high proportions of maples, which are shade tolerant. Beech and hemlock are smaller elements of diversity within the area, and are shade tolerant. Managing to convert stands to these species at this time would not be desirable, since beech bark disease and hemlock wooly adelgid may threaten the survival of these trees.

B. Alternative locations for roads or timber harvest units

Many of the stands within the project area are crowded, and could have benefited from thinning to enhance mast production or development of big trees. Access and practicality of thinning limited the stands recommended for such treatment. Some stands would not have provided commercial volumes of timber in such a harvest, when thinned to comply with silvicultural guidelines.

Potential road locations on private land and elsewhere were considered for construction to allow access for timber harvest. Had these locations appeared to be more practical in eliminating environmental effects and road mileage, steps might have been taken to acquire rights of way or choose alternate locations. However, in this area, many road corridors already exist, and were used previously for timber harvest on national forest lands.

C. Herbicides or prescribed burning to enhance oak regeneration potential

Herbicides and prescribed burning were considered to remove undesirable vegetation and leave room for the development of oak seedlings. These techniques were not carried through into an alternative, because some advance oak seedlings are already present in the areas to be regenerated, according to seedling surveys. Heavy deer browsing might destroy these and new seedlings, but evidence of current deer browse was found to be light to moderate.

D. Recreational development connected with trout fishing

Recreational uses within the area include trout fishing and other dispersed use along the Cherry River itself. Much of this use is connected with the Tri-Rivers Rail Trail, which is not a national forest facility. Constructing and promoting additional recreational developments within the area is not part of the purpose and need for action of the Cherry River project, and thus, no such alternative was fully developed.

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 responds to those in the public that do not want timber management to occur on National Forest System lands. It is essentially the “status quo” strategy that allows current activities and policies, such as road 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 Cherry River project area focuses on vegetation management to meet the purpose and need of creating young forest habitat and permanent openings, developing age class diversity and reducing competition between trees in dense stands. The proposed action includes:

- Commercial thinning of 1,589 acres using helicopter and conventional skidding
- Clearcut harvest 204 acres within the planning area (includes wildlife openings);
- Pre-treat areas to be regenerated by cutting vines;
- Plant six acres of openings with grasses, forbs, shrubs and apple or chestnut trees;
- Construct approximately 6 3/4 miles of new road; reconstruct approximately 2 1/2 miles of woods roads; and cooperate with the DOH on maintenance of state roads.

Map B in Appendix B and Table 2-1 on the following pages identify the activities that would occur in each stand proposed for harvest. Map A shows the Compartment and Stand numbers for the Project Area, in order to provide a reference for comparison with tables.

CHERRY RIVER PROPOSED ACTION

STANDS FOR CLEARCUT

Compartment/ Stand	Clearcut Acres	Conventional or Helicopter / Slope %	Year of Origin
48/19	9	C/16	1919
48/21	16	C/19	1919
48/37	8	C/17	1928
48/52	12	C/26	1933
48/57	23	C/17	1929
48/66	11	C/10	1928
62/22	13	C/30	1920
62/46	21	C/19	1925
62/52	24	C/29	1915
62/58 & 65	8 & 15	C/22 & C/10	1925 & 1910
62/65	16	C/10	1910
62/66	13	C/22	1920
62/66	9	C/22	1920
Total acres	198		

Clearcutting with the associated Chainsaw Site Prep is a regeneration harvest method in which almost all trees are harvested. Trees of commercial size, other than a few wildlife reserve trees (3-5 per acre), are harvested and removed. In general, sawtimber trees have diameters greater than 11 inches, and pulpwood trees have diameters greater than 4 inches. In a separate but associated treatment, smaller sized trees not reserved for wildlife would be felled. Snags, or standing dead trees, are cut if they pose a danger to the operator during harvest.

Manual vine treatments would involve cutting all grape and camphor vine stems in the regeneration harvest unit three growing seasons before the timber harvest begins so that shading will keep the stump from sprouting and growing. Normally, this is sufficient to keep large vines from breaking down many new trees after harvest. Grapevines that grow from seeds when the area is regenerated would generally not break down large areas of new trees, but would develop with the trees to produce mast.

STANDS FOR WILDLIFE OPENINGS

Compartment,Stand	Acres	Conventional or Helicopter /Slope percent
48/57	1-3	C/17
48/54	1-3	C/17
48/77	1-3	C/20
Total Acres	6	

Three separate areas averaging 2 acres each would be clearcut, then plowed, fertilized and planted with grasses, forbs, shrubs and apple or chestnut trees. Stumps of some of the felled trees would be pulled up and piled with other slash.

STANDS FOR COMMERCIAL THINNING**Conventional Logging Method**

Compartment,Stand	Acres	Conventional or Helicopter Slope Percent
48/16	21	C/26
48/17	45	C/11
48/18	30	C/29
48/35	13	C/14
48/37	4	C/17
48/42	54	C/18
48/43	23	C/30
48/46	27	C/18
48/52	82	C/26
48/61	11	C/24
48/62	20	C/19
48/64	38	C/28
48/65	6	C/32
48/66	14	C/10

48/67	6	C/23
48/69	5	C/14
48/70	11	C/31
48/71	14	C/30
48/76	30	C/34
48/77	23	C/20
48/87	1	C/36
61/2	76	C/11
62/11	44	C/22
62/15	30	C/19
62/18	15	C/26
62/20	19	C/25
62/21	5	C/9
62/22	26	C/30
62/29	50	C/26
62/30	23	C/12
62/32	50	C/24
62/37	21	C/31
62/39	34	C/23
62/4	8	C/18
62/5	49	C/28
62/8	25	C/25
62/9	25	C/25
62/40	15	C/29
62/52	61	C/29
62/58	18	C/22
62/65	72	C/10
62/66	128	C/22
62/80	34	C/32
Total Acres	1275	

STANDS FOR COMMERCIAL THINNING

Helicopter Logging Method

Compartment, Stand	Acres	Conventional or Helicopter Slope Percent
48/71	52	H/30
48/87	34	H/36
61/9	74	H/25
62/59	18	H/34
62/60	10	H/30
62/65	4	H/40
62/67	31	H/49
62/68	15	H/43
62/69	28	H/39
62/70	17	H/30
Total Acres	283	

Commercial thinning is a harvest method that would reduce stand density and increase mast production and tree species diversity by cutting about 1/3 of the stand density in mostly sawtimber trees. Trees to be harvested would be those growing close to better trees, and those with poor form, unhealthy crowns or less mast production potential. In stands thinned using helicopter, trees smaller than 11 inch diameter at breast height would not be cut or removed. Nor would other pulpwood provided by tree tops be removed in the helicopter logging areas. Pulpwood would be removed from conventionally logged areas.

Stands were chosen for helicopter logging primarily on the basis of slope steepness. The Forest Plan states that “Timber activities on slopes of 40% or greater will be analyzed on a case by case basis to determine the best method of operation depending on soils, slope, geology, etc. (p. 75)” Areas with less than 40% slope, as indicated in the above table, were considered for helicopter logging on a site specific basis. The Forest Plan also states “Improved logging systems will be encouraged.” (p. 76)

Helicopter logging requires landings, but no skid trails. Conventional harvest requires both landings and skid trails. Logging plans were developed during the analysis process in order to provide an estimate of the number and size of landings, and the amount of skid road disturbance. Landings expected to be constructed are shown on alternative maps, and skid road estimation maps are included in the project file. Skid road locations are estimated on the basis of Forest Plan guidance, practices in recent timber sales on National Forest lands, and avoidance of perennial, intermittent and ephemeral stream channels.

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.

ROADS FOR CONSTRUCTION

Map Reference Number	Miles
908A	1/2
908C	1 3/4
928	2 1/2
911	1/2
912	1/2
913	1
Total miles	6 3/4

ROADS FOR RECONSTRUCTION

Map Reference Number	Miles
908B	1/4
928	1
913	1 1/4
Total miles	2 1/2

Road construction would involve building a new gravel road where none is present. Road reconstruction would improve an existing road to make it drivable, and some areas may be slightly relocated from the existing road grade to reduce slope, or avoid wet spots or other environmental concerns. The road design will be capable of sustaining logging traffic during spring through fall, with short time periods of restricted or halted traffic. Use during the winter would be expected to be possible only during short periods of suitable weather conditions. None of the road locations is currently open to the public, and this road closure status will be maintained by gating.

An additional decision and environmental assessment is not required to maintain existing Forest system roads. This maintenance would involve cutting brush or trees to remove hazards and daylight surface, grading, stone surfacing, ditch cleaning, and installation or replacement of signs, gates and drainage structures on an as needed basis.

Replacement of stream crossing structures, where needed, would be done considering aquatic organism habitat and passage. Two stream crossing structures in particular need to be replaced

to address current standards for crossing design and to restore unobstructed stream passage for aquatic organisms. FR 908 crosses Coal Siding Run with two small (dual) culverts, and the state road, WV 94/5, crosses Morris Creek with a multiple tube concrete structure. Replacement of these structures is needed to address water quality, stream habitat and aquatic organism passage problems that currently exist. Partnerships with the state would be sought for addressing stream passage problems on state roads, and for other state road maintenance needs as described above.

C. Alternative C

Alternative C was developed in order to respond to the issues, while meeting the purpose and need for action for the Cherry River project. Alternative C meets the Purpose and Need for action in the following ways.

- Alternative C would create young forest habitat and a savannah within the area to improve habitat for species such as grouse, deer, and squirrel. The three wildlife openings were replaced by one savannah as a result of public input, which indicates that game and non-game habitat diversity in part of Compartment 48 could be increased from that provided by the proposed action, while benefiting a variety of wildlife species.
- It would develop age class diversity across the project area in order to ensure large, high quality hardwood trees are growing across the watershed so that a sustainable amount of mast is provided for wildlife species and forest products are available over time. It would use clearcutting with residuals and shelterwood harvests to develop age class diversity.
- It would reduce the amount of competition between trees for light and water resources in dense, over-crowded stands to improve timber quality and stand health in the remaining trees and decrease the risk of insect and disease infestation, by thinning and single tree selection harvests. A few stands were changed from thinning treatments to single tree selection harvests as a result of public input which is in keeping with Forest Plan guidance. The Forest Plan states “Uneven-aged management will normally be used when tolerant vegetation is the objective, when needed to meet visual quality objectives. . . “ (p. 135). In stands changed from thinning to selection harvests, sugar maple will be the objective and these stands are near open roads or private lands.

Specific activities proposed are shown in tables, and summarized as follows:

- 133 acres of clearcuts, divided into 6 separate units
- 64 acres of shelterwood harvests, in 3 separate units
- 81 acres of individual tree selection harvests in 2 separate units
- 10 acres in one savannah, maintenance of log landings for wildlife opening habitat
- 1,410 acres of thinning. Timber harvest activities use conventional and helicopter logging.
- 87 acres of oak mast tree release in young stands
- 2 miles of new road construction in 2 segments, and ¼ mile temporary road
- About 1 1/3 miles of road reconstruction in 3 segments
- Road maintenance of existing roads

Alternative C was developed in response to the issues raised during the scoping period by the public and by Forest Service and other resource specialists. Alternative C responds to the 3 issues as described below.

Issue 1: Soil Productivity/Soil Quality

Issue: The Proposed Action may result in reduced soil productivity through compaction and displacement of soil from conventional logging. Harvesting trees may remove more base cations from the site than can be replenished through natural processes, given the amount of acid deposition and the soil types that occur in the area. This might eventually result in depletion of the soil reserve of base cations with further soil and stream acidification effects.

Alternative C reduces the amount of conventional logging and increases the amount of helicopter logging. This would reduce the amount of soil compaction and displacement and still meet the purpose and need. It reduces conventional logging and thus disturbance on the areas most sensitive to soil loss. The areas most sensitive to soil loss are on Buchanan and Ernest soils which are classified as wet. More soil and thus more base cations would be retained on site. Alternative C reduces the total amount of tree removal, by reducing acreage logged. More tree tops and limbs would also be retained on site, in that the "topwood" would not be sold in the helicopter units to be removed for pulpwood and other low value products.

Issue 2: Soil Erosion and Stream Sedimentation

Issue: Because some areas have been identified within the project area as being more at risk for soil erosion effects due to soil type, slope, and proximity to stream channels, the proposed action may increase erosion and stream sedimentation and impact trout and other aquatic biota.

Alternative C eliminates some areas of timber harvest on slopes over 40%, on wet soils, in riparian areas and in coves. In some other of these areas, it changes the harvest method to helicopter logging. This reduces the number of stream crossings by skid trails, and the amount of soil available to erode from skid roads in the wettest and most sensitive areas.

Issue 3: Oak regeneration

Issue: Oak species composition would be unlikely to be maintained in some stands by the clearcutting in the proposed action.

Alternative C maintains the same acreage of young forest habitat as in the proposed action. It changes the locations, sizes and methods of the regeneration harvests. Surveys were completed of seedlings and vines already present on the forest floor within the stands. Alternative C increases the size of the units with best chances for maintaining or enhancing the amount of oak in the regenerated stand, based on survey results. Units with the poorest chances of regenerating oak and other species are not clearcut in Alternative C.

In the stands to be clearcut, the existing trees are diverse, and include yellow poplar, oaks, and other species. The regenerated stands would be expected to be similar in diversity and percentage of oak. Increasing the size of harvest units would also be expected to reduce the impact of future deer browse, should it increase during the regeneration period.

Some stands are scheduled for shelterwood harvests, to increase the oak percentage and the size of oak seedlings already present. The size of these units is also increased, to decrease edge and potential impact from deer.

In this alternative, locations of the harvests were chosen to avoid those areas with the most competitive plants, trees and shrubs, to avoid the use of herbicides. It is recognized that ferns and competitive understories may restrict the development of oaks and other valuable trees. Grapevines are present in large numbers in some stands, and the manual cutting treatment in the proposed action may not be effective. To reduce the need for herbicide treatments, sprouting

vines will be clipped in an additional manual treatment of stems that are not shaded enough to die from the first treatment. Areas with highest concentration of vines were dropped from regeneration. Harvesting in these areas as proposed might result in poor regeneration and survival of the best trees to produce large, high quality hardwood trees for a sustainable amount of mast and forest products over time.

Young mixed hardwood stands that were regenerated by clearcutting in the last 10 years currently have healthy oak trees. These young trees are unlikely to develop and survive to eventually be a large part of the mature stand, because yellow poplars and other faster growing trees are beginning to overtop them. Alternative C provides treatment to retain healthy oak trees in clearcuts completed within the last ten years.

Log landing, road management activities, and riparian management guidelines would be described the same as Alternative B, but the number of log landings would differ from Alternative B.

Map C in Appendix B shows the locations of projects included in Alternative C.

REGENERATION HARVEST

STANDS FOR CLEARCUT TO DEVELOP AGE CLASS DIVERSITY AND YOUNG FOREST HABITAT

Compartment/ Stand	Approx Clearcut Acres	Conventional or Helicopter Slope %	Manual vine treatment	Chainsaw Site Prep
48/52	25	C/26	twice	X
48/66	13	C/10	once	X
48/57	23	C/17	none	X
62/22	25	H/30	none	X
62/52	23	H/29	twice	X
62/58 & 65	24	C/22,10	twice	X
Total Acres	133			

Clearcutting with the associated Chainsaw Site Prep is a regeneration harvest method and is the same as described in Alternative B.

In Alternative C, manual vine treatments would differ from the proposed action, in that stands with most vines would have two cutting treatments during or before the regeneration period, and stands with very few vines would not have a vine-cutting treatment. The additional manual treatment to cut sprouting vines would occur prior to or immediately after the harvest to prevent the future dominance of vines in the developing young stand after regeneration. The treatment methods would be the same as described under Alternative B. The number of treatments is described as once, twice or none in the above table.

REGENERATION HARVEST

STANDS FOR SHELTERWOOD TO ENHANCE OAK

Compartment/ Stand	2-Cut Shelterwood Acres	Conventional or Helicopter/ Slope Percent	Vine Treatments	Site Prep with 2 nd cut
48/21	18	C/19	none	X
62/66 (S)	21	H/22	once	X
62/66 (N)	25	H/22	once	X
Total Acres	64			

Shelterwood harvest is a regeneration harvest method that would involve two commercial harvests within a period of time, expected to be between 5 and 7 years. At the time of the first harvest, about 40% of the stand density in mostly sawtimber trees would be harvested for timber products. Stocking surveys would be done in the years following harvest to assure that adequate seedlings are present in desirable and acceptable tree species. Then the rest of the stand density, other than a few trees retained for wildlife, would be harvested. Stems too small or unmerchantable would also be felled in the Site Preparation treatment, except for those retained for wildlife. The resulting young stand is expected to have a larger and taller oak component than if the stand was clearcut in one commercial harvest operation. Vine treatment would be the same as described above, done once, three seasons before the first harvest.

OAK/MAST TREE RELEASE

Compartment/ Stand	Approx Acres
48/89	10
61/105	12
61/107	21
61/104	12
61/106	11
62/101	10
62/102	11
Total Acres	87

Oak mast tree release in previously regenerated young stands would involve using chainsaws or axes to cut young trees up to 5 inches in diameter to provide more room for oak and other desirable mast trees adjacent to the cut trees to develop. Few of the trees to be cut are currently 5 inches in diameter, but most are around 2 inches in diameter. Forty to sixty oaks per acre would be released by cutting other trees touching their crowns. If healthy oak trees are not present in parts of some stands, then hickory, black cherry or butternut trees could be released. These

stands were regenerated within the last 15 years, and are not currently planned for timber harvest.

**STANDS FOR SUGAR MAPLE REGENERATION
USING UNEVEN AGED MANAGEMENT**

Compartment/ Stand	Single Tree Selection Acres	Conventional or Helicopter / Slope %
62/5	20	C/30
62/5	31	H/29
62/15	30	C/19
Total acres	81	

Single tree selection harvest is an uneven aged regeneration method with the goal of maintaining mostly sugar maples of various size classes in the stand over a long period of time, to provide a continuous forest scene and forest products in perpetuity. The first commercial harvest would be very similar to the thinning treatment of the proposed harvest. It would involve leaving about 2/3 of the stand density which is expected to allow the growth of existing sugar maple seedlings and small trees under the small canopy openings produced by the harvest. These trees would require additional harvests if they are to continue growing into the main crown canopy. These additional harvests would be expected to be needed after 10-20 years of growth. The additional harvests would be scheduled, and another EA done, at that time.

STANDS FOR WILDLIFE SAVANNAH

Compartment, Stand	Acres	Conventional or Helicopter /Slope percent
48/57	10	C/17
Total Acres	10	

A wildlife savannah is a heavy partial harvest with hard mast trees greater than 13 inches in diameter as the primary leave trees. Stand density would be reduced by 2/3. Other leave trees would include snags and clumps of snags, cull trees, and smaller diameter soft mast tree clumps. Other trees would be skidded into piles and some of the stumps would be ground up and/or piled. The unit would be plowed, limed, fertilized and seeded, and a waterhole would be constructed. Maintenance would be by mowing. Log landings would also be maintained as wildlife openings under this alternative.

STANDS FOR COMMERCIAL THINNING TO REDUCE COMPETITION BETWEEN TREES IN OVERCROWDED STANDS

Conventional Logging

Compartment,Stand	Acres	Conventional or Helicopter/ Slope Percent
48/35	13	C/14
48/37	13	C/17
48/46	13	C/18
48/52	63	C/26
48/62	15	C/19
48/64	38	C/28
48/66	9	C/10
48/69	5	C/14
48/70	11	C/31
48/76	13	C/34
48/77	23	C/20
62/4	7	C/18
62/8	25	C/25
62/11	35	C/22
62/18	12	C/26
62/20	10	C/25
62/58	8	C/22
62/65	92	C/10
62/66	38	C/22
Total Acres	443	

STANDS FOR COMMERCIAL THINNING TO REDUCE COMPETITION BETWEEN TREES IN OVERCROWDED STANDS

Helicopter Logging

Compartment,Stand	Acres	Conventional or Helicopter /Slope Percent
48/17	45	H/10
48/18	29	H/29
48/42	54	H/18
48/43	23	H/30
48/46	14	H/18
48/52	7	H/26
48/61	10	H/24
48/65	6	H/32
48/67	4	H/23
48/71	67	H/30
48/76	17	H/34
48/87	34	H/36
61/2	76	H/11
61/9	74	H/25
62/21	4	H/9
62/22	14	H/30
62/29	49	H/26
62/30	23	H/12
62/32	50	H/24
62/37	21	H/31
62/39	34	H/23
62/40	15	H/29
62/52	65	H/29
62/58	8	H/22
62/59	18	H/34
62/60	10	H/30
62/65	1	H/40

62/66	66	H/22
62/67	32	H/49
62/68	16	H/43
62/69	29	H/39
62/70	17	H/30
62/80	35	C/32
Total Acres	967	

Thinning would be by the same methods described in Alternative B. The harvest method was changed to helicopter in areas with wet or sensitive soils, on steeper slopes, and in coves in order to respond to the sediment issue described above.

ROADS FOR CONSTRUCTION AND RECONSTRUCTION

Map Reference Number	Miles	Construction or Reconstruction
908B	1/4	Reconstruction
908C	3/4	New Construction
928	1 1/4	New construction
928	1	Reconstruction
913	1/10	Reconstruction
Temporary Road	1/4	Construction/Closure after use

Road construction methods would be the same as described above under Alternative B. Road lengths were reduced to minimize stream crossings, with the attendant effects on riparian values and risk of stream sedimentation. Helicopter logging made it possible to reduce permanent road crossings of stream channels without necessitating crossing the same channels with skid trails.

Temporary road would be constructed to access a landing, as shown on the map of Alternative C. Road related mitigations would apply to this temporary road. The primary difference between this road segment and the system road to be constructed would be its closure after use by removing culverts, installing dips or waterbars, and revegetating. The location of this road on a flat and well drained ridgetop allows for minimum construction standards to be effective in providing for use.

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 same riparian guidelines as in Alternative B would be used.

An explanation of each alternative's consistency with the Forest Plan is provided in the "Forest Plan Consistency" sections in Chapter 3. Implementing the alternatives would not require a revision of an environmental impact statement or environmental assessment. Timber sale and possibly road contracts would be awarded to implement either Alternative B or Alternative C. These contracts would contain terms and conditions which would help implement mitigation requirements such as those listed below or imposed by statute, regulation, or Executive Order.

Mitigation & Design Features Common to Alternatives B & C

The following mitigation measures are to be used to mitigate potentially harmful effects of the action alternatives. Location of projects within both alternatives has mitigated other potentially harmful effects.

1. Protect riparian resources of all perennial, intermittent and ephemeral streams by applying the riparian buffer protection measures, as described in Appendix 1 and summarized below:
 - a. Perennial streams would be protected with a 100 foot riparian buffer width on each side of the channel, with no harvesting of trees within the buffer width except as necessary to meet riparian or aquatic resource management needs, or other limited objectives (such as road crossings). Intermittent streams with a watershed area of 50 acres or more would have no timber harvesting within 100 feet either side of the channel. Intermittent streams with less than a 50 acre watershed area would have no timber harvesting within 50 feet either side of the channel. And all ephemeral streams would have no harvesting within 25 feet either side of the channel. Buffer widths may be adjusted based on interdisciplinary review and site specific field investigation. Riparian buffers shall, at a minimum, encompass the riparian area defined on the basis of soils, vegetation and hydrology and the ecological functions and values associated with the riparian area.
2. Forest Plan filterstrip guidance should be followed for all functioning stream channels (perennial, intermittent and ephemeral) within or adjacent to areas of harvesting, or when near or crossed by ground disturbing activities (roads, skid roads and landings, etc.)
3. Filterstrip guidance that appears in Appendix R of the MNFLMP should be used as the standard of protection. Filterstrip width would be a minimum of 100 feet. On several soil categories as shown in the soils effects section of this document, the filterstrip would be 150 or 200 feet wide. Filterstrip width may be modified during implementation by an interdisciplinary review process.
4. Skid roads and log landings should be located to minimize soil and filterstrip 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 and areas of disturbance to the maximum extent practical. Blading skid roads in wet soils should be held to cuts less than 18 inches deep in the soil profile as much as possible.
5. In conventional harvest units, overland skidding should be used wherever practical, especially in those areas of the more gentle terrain when soil and wetness conditions will support it, in order to avoid or reduce the construction of bladed skid roads.

6. Skid roads should be promptly closed and rehabilitated prior to final acceptance for the harvest units they serve. Rehabilitation actions could include all or a selection of the following: drainage dip installation (waterbars and dips), removal of structures such as culverts and temporary bridges, channel restoration at crossings, decompaction (ripping of primary skid roads), outsloping, and revegetation by seeding and mulching. Use of annual grasses for seeding is permissible. These measures would be required to help stabilize soil, disperse surface runoff, and reduce the potential for sediment and stormflow effects.
7. The Normal Operating Season specified in the timber sale contract should be from May 1 to November 20.
8. Winter season activities in ground-based yarding (skidding) harvest units should only be authorized after an interdisciplinary review of the affected areas, to include an assessment of soil and water resource concerns and risks.
9. Timber activities (skidding and log hauling) outside the normal operating season in the timber contract (winter operations) should 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 will 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.
10. Helicopter service landings will implement and follow all requirements of State regulations pertaining to protection against spills of hazardous substances, and response to accidental spills.
11. All National Forest roads on which timber hauling may occur outside the normal operating season should be designed to a 4 season standard. New and reconstructed road design and resource protection measures should be determined by the resource conditions and site sensitivity identified during field investigation of the proposed road alignment. More sensitive sections should be constructed to a higher standard, and may include such mitigation as additional surface stone, culverts and ditches, and rock armoring at culvert outfalls. More routine sections of the alignment may be constructed with less mitigation, but should still be designed to protect soil and water resources, and would utilize road surfacing with stone and the appropriate drainage control structures. Additional surface stone should be applied whenever problem areas start to develop, such as rutting of the road surface. All exposed soil should be revegetated to stabilize the soil and reduce erosion.
12. Road maintenance or repair should 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.

13. Road design and maintenance mitigation should 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, as needed.
14. Leave all shagbark hickory, and den trees in all harvest units; retain all cull trees, and snags unless they pose a safety hazard.
15. Leave all topwood and slash scattered throughout clearcuts.
16. Use bulldozer for clearing of wildlife openings or savannahs from July 15 through October 15, unless clearing could be scheduled to avoid an additional period of soil disturbance.
17. A closure order would be issued to restrict public use of National Forest lands when helicopter flights are on-going.
18. Signs and flaggers would be used to warn and/or stop traffic when helicopter flights are near open public roads.
19. Road cut slopes would be revegetated where needed to eliminate the visual distraction of exposed soil and erosion.
20. Planting and/or tubing of oak seedlings may be used to increase the number of mast producing species, if stocking surveys indicate little diversity. Blight resistant American chestnut trees or seeds may be planted for species and mast production diversity, if they are available. No more than 20 acres of planting would be estimated.
21. All sites described as being eligible to the NRHP or unevaluated, and which are near or adjacent to logging activities are marked and they would be avoided during all phases of project implementation. 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.
22. 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.
23. Use native species in the seed mixes and use non-invasive, non-persistent species as temporary cover to revegetate disturbed areas, where possible. Relatively weed free mulch such as straw or coco fiber mats could be used in place of hay, where possible.
24. If butternut trees are found in any of the harvest units, they should not be removed unless a safety hazard.
25. A prohibition on felling, conventional and helicopter skidding and hauling during the first week of WV deer gun hunting season will be included in the timber sale contract.

Mitigation & Design Features to Be Implemented Only Under Alternative B

1. Major stream crossings on Buckheart Run and Morris Creek should be by bridge, or some other open stream bottom design structure.

2. In areas with less than 6 snags per acre, create snags for Indiana bat habitat. Assuming that helicopter logging may result in few snags, and allowing for the numbers of snags currently present, it is estimated that this mitigation may be needed on 1135 acres harvested under Alternative B. The actual numbers of snags remaining after harvest will determine where this work would be done.

Mitigation & Design Features to Be Implemented Only Under Alternative C

1. In coordination and cooperation with the State, where possible implement some or all of the following road improvements on WV94/5 to reduce sediment delivery to Morris Creek: additional culverts for ditchline relief; increase the size of some existing road culverts (to reduce plugging); armor ditchlines with small rip-rap; gravel surfacing on portions of the road nearest headwater channels; and stabilize small gullies below the road at culvert discharge points.
2. For oak mast tree release areas, a maximum of 50 trees per acre may be released within 25 feet of ephemeral streams, and a maximum of 25 trees per acre may be released within 50 feet of intermittent streams, and within 100 feet of perennial streams. See Appendix 1.
3. In areas with less than 6 snags per acre, create snags for Indiana bat habitat. Assuming that helicopter logging may result in few snags, and allowing for the numbers of snags currently present, it is estimated that this mitigation may be needed on 1126 acres harvested under Alternative C. The actual numbers of snags remaining after harvest will determine where this work would be done.
4. Drop from Alt. 1 harvesting the following areas:
 - i. West edge of Comp. 48 stand 52; no skid roads into the cove.
 - ii. West side of Comp. 62 stand 8, below FR913.
 - iii. All of Comp. 62 stand 4.
5. For the following harvest areas in the Coal Siding Run watershed, only one conventional harvest unit would be open at one time (of three sale units that would be set up in the sale contract). If a skid road is needed outside a payment unit for logistics or environmental reasons, it can be permitted to access the open harvest unit.
 - i. Comp. 48 stand 52, conventional thinning (one unit).
 - ii. Comp. 48 stand 52, conventional clearcut (one unit).
 - iii. Comp. 48 stands 62 and 64, conventional thinning (one unit).
6. For the following harvest areas in the Morris Creek watershed, only one conventional harvest unit would be open at one time (of a minimum of two sale units that would be set up in the sale contract). If a skid road is needed outside a payment unit for logistics or environmental reasons, it can be permitted to access the open harvest unit.
 - i. Comp. 62 stands 11, 18 and 20, conventional thinning (minimum of one unit).
7. For Alternative 1 harvest areas in Comp. 48 stands 52, 62, 64, and Comp. 62 stands 8, 11, 18 and 20, the following additional mitigations would apply.

- i. Harvest operations in these conventional areas will be restricted to the Normal Operating Season ONLY (May 1 to November 20). No harvesting activities, including skidding, in the normal winter shutdown period (November 21 to April 30) would occur.
 - ii. Skid roads serving an area that has completed harvesting in that area (served their intended use) will be closed out within 7 days of skid road acceptance by the Forest Service. Skid road closure (waterbars, lime, seed and mulch) will be completed as harvesting is completed. They will not be held until completion of the entire harvest unit. If this measure can not be accomplished within the normal seeding seasons, then waterbars, lime and mulch will be promptly done within the specified time frame, and seeding done as soon as the needed seeding conditions occur.
 - iii. Wet weather shutdown and temporary waterbars are standard measures required and used in Sale Administration. In these specified stands especially close attention will be paid to accomplishing:
 1. Wet weather shutdown
 2. Temporary waterbars in place for weekends and all other periods of inactivity
 - iv. Skid road design would include “vertical rolling” at channel approaches.
 - v. Install silt fence (or hay bales) at toe of fills along skid road stream crossings (but not across channels).
8. Tree felling in all helicopter logging units would be prohibited during the period between and including April 1 and November 14, unless further consultation is done with the USFWS.
9. Temporary roads should be promptly closed and rehabilitated prior to final acceptance for the harvest units they serve. Rehabilitation actions could include all or a selection of the following: drainage dip installation (waterbars and dips), removal of structures such as culverts and temporary bridges, channel restoration at crossings, decompaction (ripping of primary skid roads), outsloping, and revegetation by seeding and mulching. Use of annual grasses for seeding is permissible. These measures would be required to help stabilize soil, disperse surface runoff, and reduce the potential for sediment and stormflow effects.

Comparison of Alternatives

The following table summarizes the activities that may be implemented under each of the Cherry River alternatives.

Table 2-4: Summary of Cherry River Alternatives

Activity	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C
Clearcut regeneration harvest, with the associated site preparation	0 ac	198 ac	133 ac
Commercial thinning	0 ac	1589 ac	1410 ac
Shelterwood regeneration harvest, with the associated site preparation*	0 ac	0 ac	64 ac
Vine cutting treatment	0 ac	Up to 198 acres	131 ac
Selection harvest	0	0	81
Oak and mast tree release	0	0	87
Wildlife opening/savannah construction	0	6	10
Total acres harvested	0 ac	1793 ac	1698 ac
Timber volume removed	0 CCF	19,332 CCF	16,090
Conventional ground-based skidding	0 ac	1510 ac	606 ac
Helicopter yarding	0 ac	283 ac	1092 ac
Potential helicopter landings	0 landings	4 landings	10 landings
Conventional landings	0 landings	18 landings	9 landings
Road Construction	0 mi	6 3/4 mi	2 mi
Road Reconstruction	0 mi	2 1/2 mi	1 3/10 mi
Temporary Road Construction & Closure	0 mi	0 mi	¼ mi

* Figures provided in this table are approximations. Shelterwood harvests involve two separate periods of timber harvest on the same acreage. The second harvest would occur 5-7 years after the first harvest.

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

Table 2-5: Comparison of the Cherry River alternatives' achievement of project objectives.

Response to Purpose and Need	No Action Alternative A	Proposed Action Alternative B	Alternative C
Young forest habitat and permanent openings	0	204 acres	207 acres
Age Class Diversity:			
Percent in seedling/sapling class in 2015	2.3%	5.4%	5.4%
Reduced competition for light and water	0	1589 acres	1578 acres

Table 2-5: Comparison of the Cherry River alternatives' response to issues

Response to Issues	(No Action) Alternative A	(Proposed Action) Alternative B	Alternative C
Soil Productivity/Soil Quality			
% of individual activity areas disturbed*	0	2-10	1-7
% of total activity areas disturbed	0	6	4
% of project area disturbed	0	1	<1
Total acres of disturbed soils	0	115	64
Soil Erosion/Stream Sedimentation			
Skid Roads (miles)	0	46.6	19.9
Landings (acres)	0	19	18
Conv. Harvest on Wet Soils (acres)**	0	604	135
Conv. Harvest in Coves (acres)**	0	328	91
Conv. Harvest on Slopes >40% (ac)**	0	25	6.7
Road Construction (miles)	0	6.3	2
Road Reconstruction (miles)	0	2.6	1.3
Road Maintenance (miles)	3.2	3.2	3.2
Channel Crossings by Roads (#)	0	31	11
Channel Crossings by Skid Roads (#)	0	122	29
Portion of Watershed Harvested (%)	0	19.1	18.1
Portion Wtrshd. Harvested Conv. (%)	0	16.1	6.5

Response to Issues	(No Action) Alternative A	(Proposed Action) Alternative B	Alternative C
% of Morris Creek wtrshd. harvested conventionally	0	31.3	8.1
% of Coal Siding Run wtrshd. harvested conventionally	0	29.7	20.8
3. Oak regeneration			
Acres regenerated with over 50% oak	0	115	149
Acres of cultural treatment to enhance oak mast	0	0	87

**Percent disturbance is based on 15 foot skid trail width.*

***Wet soils, coves and slopes over 40% may occur in the same location, thus the acreage can not be added for a total.*