

## 2 ALTERNATIVES

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This chapter describes the action alternatives, the No Action Alternative, and the alternatives not considered in detail. This chapter also compares the alternatives in terms of their environmental impacts and their achievement of objectives.

### 2.1 Description of the Alternatives, Including No Action

This section describes the alternatives considered in detail.

#### 2.1.1 No Action Alternative

The Forest Service Handbook (FSH) requires the Forest Service to study the No Action Alternative in detail, and to use it as a baseline against which impacts of action alternatives can be measured (FSH 1909.15, 14.1). Under this alternative, none of the specific management activities proposed in this document would occur. Ongoing activities such as recreation, fire suppression, and road maintenance would continue. Management activities analyzed under other environmental documents may still occur.

This alternative does not address the objectives and needs for timber harvest, travel management, fuel reduction, or insect infestation.

#### 2.1.2 Alternative 2

##### Focus of Alternative 2

The specific vegetative treatments associated with Alternative 2, the proposed action, are discussed in the vegetative treatment narrative and identified in Table 2-1 and Figure 2-1, Figure 2-2, Figure 2-3, and Figure 2-4. This alternative emphasizes commercial thinning to reduce risk of mountain pine beetle infestation and to improve long-term forest growth and yield. Shelterwood seedcuts and overstory removal cuts would make progress toward forest diversity goals by changing the forest age-class distribution on the landscape, enhancing meadows, and retaining some large trees for scenery and for future snags to benefit cavity-nesting wildlife. Fuel breaks and fuel treatments would reduce wild fire hazards adjacent to private property.

Approximately 6.2 million board feet (MMBF) (12,400 CCF) of sawtimber and wood products would be produced by this alternative. Sufficient large green trees would be available to provide future large-diameter snags and meet Forest Plan snag requirements. Ongoing activities such as recreation, fire suppression, and road maintenance would continue to occur.

Stand-by-stand proposals are described in the project file. A comparison of alternatives can be found in Section 0. A stand map is included in Appendix C.

##### Vegetation Treatments

- **Commercial thinning.** Thinning of mature or pole-sized trees in pine stands would take place on 1,350 acres to promote optimal growth of remaining trees. The stands would be commercially thinned from below to remove suppressed and excess trees. Trees greater than 9" in diameter at breast height (DBH) may be sold commercially. Residual basal area (BA) would average 40 to 80 square feet per acre (about 20 to 30 feet between trees averaging 12" DBH). Following commercial thinning, timber stand improvement would take place to remove excess trees less than 9" DBH. Thinning would reduce competition among trees, increasing vigor and decreasing risk of beetle infestation and severe fire. On an estimated 70 acres within these stands, conifers would be removed from aspen

clones and from an area within 66 feet of each clone to reduce pine encroachment and perpetuate the aspen component of the stands.

In several contiguous stands in the southwest corner of the project area, commercial thinning prescriptions would be modified in dense, mature pine stands to move these stands toward late-succession conditions. Modifications of standard commercial thinning would consist of uneven spacing of trees and retention of clumps of the largest trees, especially around existing snags with cavities created by wildlife. These stands are currently threatened by mountain pine beetle infestation, and removal of smaller, suppressed trees would increase the chance that larger trees will withstand potential beetle attack. This treatment would take place on 254 acres. Together with adjacent open-canopy pine stands planned for understory prescribed burning, this would result in a block of 349 acres of forest to be managed for late-succession characteristics.

Management of these stands as late-succession habitat would be tracked in the Forest vegetation database. This treatment is not appropriate in the eastern part of the project area because beetle infestation has already affected most of the dense stands, reducing opportunities for development of sizable contiguous blocks of this structure.

- **Overstory removal.** Overstory trees would be removed from 464 acres to allow the understory to develop. This would be the final harvest of the original stand and an improvement cut for the new stand. Approximately five square feet of BA (about 110 feet between trees 16" DBH) would be retained to provide visual variety and future large-diameter snags. Following removal of the overstory, defective and excess trees less than 9" DBH would be cut. Conifers would be removed from aspen clones and from an area within 66 feet of each clone. Precommercial thinning (see below) of seedling and sapling pines would follow overstory removal.
- **Shelterwood seed cut** is proposed on 193 acres. This silvicultural treatment removes some of the mature trees to open the stand and allow young trees to regenerate and become established. Approximately 20 to 30 square feet of BA would be retained to protect the regeneration from climatic conditions (about 40 to 50 feet between trees 14" DBH). This treatment would retain enough large trees to provide a seed source and future large-diameter snags. Following removal of the mature trees, defective and excess trees less than 9" DBH would be cut. Conifers would be removed from aspen clones and from an area within 66 feet of each clone.
- **Meadow enhancement** is proposed on 79 acres. This treatment is designed to reestablish historic meadow conditions in meadow areas that have been encroached on by conifers. All conifers would be removed.
- **Products-other-than-logs (POL)/Precommercial thinning (PCT)** is proposed on 203 acres. Trees up to 9" DBH would be thinned to approximately 14'x14' spacing. Objectives are to produce wood fiber, reduce risk of loss to pathogens, improve growth, preclude stand stagnation, and reduce fuel continuity. Suppressed, defective, and excess trees are removed. POL consists of trees generally 5-9" DBH. Trees in this size range may or may not be merchantable, depending on market conditions.
- **Sanitation.** Mountain pine beetle populations are at high levels in parts of the project area and there is potential for further infestation. To address new pockets of infestation before they can expand, cutting of beetle-infested trees (sanitation) would take place where necessary in small patches up to two acres in size. Across the project area, this treatment could take place on a total of 500 acres. Each sanitation harvest proposal would be field-reviewed by resource specialists before implementation and would comply with Forest Plan direction and design criteria. No new permanent roads would be

constructed for this treatment. Intent of treatment is to limit the effect of the mountain pine beetle attack and preserve the characteristics and integrity of the stands.

- **Precommercial thinning** is proposed on 763 acres. Trees up to 5” DBH would be thinned. Objectives are to reduce risk of loss to pathogens, improve growth, preclude stand stagnation, and reduce fuel continuity. This treatment does not appear on Figure 2-1 or Figure 2-2 where it would follow overstory removal.
- **Fuel treatments**, including prescribed burning and fuel breaks, are proposed for a total of 1,276 acres. The total acreage in the following discussions of individual treatments exceeds actual fuel treatment acres because approximately 20 acres of fuel break would overlap a prescribed burn.

**Prescribed burns** are proposed on 1,127 acres. Parameters would include no more than 10% allowable mortality in the overstory and no more than 50% in trees less than 9” DBH. A detailed prescribed burn plan would be prepared and approved prior to burning to address safety, escape contingencies, and resource considerations. Approximately 946 acres of prescribed burning would overlap commercial thinning (844 acres), meadow enhancement (37 acres), overstory removal (24 acres) and shelterwood seed cut (41 acres).

**Fuel breaks** are proposed on 169 acres to reduce fuel loads adjacent to roadways and private land. Mechanical methods (chipping, mulching, etc.) would be used to reduce the density of trees up to 9” DBH. The resulting stands would consist primarily of trees at least 9” DBH with an open understory. Remaining basal area would range from 30 to 60 square feet per acre.

**Activity fuels.** Treatment of logging slash after timber harvest is a provision of standard timber sale contracts. Mechanical and/or burning treatment of these activity fuels would take place in all treatment units where fuel loading would exceed Forest Plan direction.

**Wildland Urban Interface and Communities At Risk.** Alternative 2 would treat fuels on approximately 185 acres designated as Wildland Urban Interface (WUI) and approximately 91 acres adjacent to Communities at Risk (CARs). These acres are included in the fuel treatment acres identified above.

*Table 2-1. Vegetation Treatments - Alternative 2*

<b>Vegetation Treatments</b>	<b>Acres</b>
Commercial thinning*	1,350
Overstory removal	464
Shelterwood seed cut	193
Meadow enhancement	79
Products other than logs/Precommercial thinning	203
Precommercial thinning	763
Fuel treatment (prescribed burning)	1,127
Fuel treatment (fuel breaks)	169

*\*Includes approximately 70 acres of hardwood enhancement (see treatment description on p. 1).*

*Portions of treatments overlap.*

## **Transportation System and Travel Management**

Objectives of proposed travel management include reducing maintenance costs and negative effects on wildlife habitat, soils, and water while retaining a transportation system that meets current and future resource management needs. From a soil and watershed standpoint, the

specific objective of road decommissioning and road storage is to control erosion by decreasing the production, interception, and rapid transport of runoff by restoring or augmenting the natural drainage of the road template, and decreasing sediment transported to waterways. Measures may include addition, replacement, upgrade, or removal of existing non-functional drainage structures (e.g., culverts); ripping to remove ruts; re-contouring; installation of waterbars or rolling dips; placement of slash and boulders; tree planting; and revegetating. Identified reconstruction and/or maintenance that is necessary for implementation of this project would be completed prior to road use. Work on other roads would take place as funding allows.

It would be necessary to acquire road easements across private land to harvest stands 81128-05, 81128-07, 81128-38, 81128-42, and 81128-77, located in Sections 7, 17, and 18, T. 4N., R. 4E., and stand 0811280072, located in Section 8, T.4N., R.4E (see Appendix C). These treatments would reduce mountain pine beetle infestation and hazardous fuels. Negotiations are currently in progress to secure easements to these parcels from the affected landowners. In the event that the easements cannot be acquired and it is not possible to harvest the units off of existing roads, the units would not be harvested in this treatment cycle.

Transportation management changes are depicted in Table 2-2 and Figure 2-3 and 2-4.

- **New construction.** Approximately 3.1 miles of new road would be constructed to reach stands in the western part of the project area and to provide access to a log landing off NFSR 534. Newly constructed roads would be closed following completion of the project.
- **Reconstruction.** Approximately 10.4 miles of existing road would be reconstructed. Reconstruction would consist mainly of adding drainage structures to prevent the road surface from becoming muddy, and adding or improving surfacing.
- **Maintenance.** Minor maintenance would take place on approximately 7.7 miles of existing road. This would involve blading ruts, cleaning ditches, and other minor repairs where problems exist.

### Travel Management

- **Roads currently open changed to year-long closure.** Approximately 4.9 miles of roads that are open would be closed year-round.
- **Decommissioning.** Approximately 1.5 miles of National Forest System Roads (NFSRs) and 9.0 miles of unclassified roads would be decommissioned. One of the NFSRs proposed for decommissioning is essentially already closed and not driveable. The other two NFSRs proposed for closure are in close proximity to private property and not necessary for administrative purposes. The unclassified roads proposed for closure were not built or sanctioned by the Forest Service, have not been maintained by the Forest Service, and are not needed for access for multiple uses in the Project Area. Based on available funding, the roads would be decommissioned in accordance with Forest Service road management policies (FSM 7700).

Table 2-2. Transportation Management - Alternative 2

Transportation System Changes	Miles
New road construction	3.1
Road reconstruction	10.4
Road maintenance	7.7
Roads decommissioned	10.5

## Design Criteria

The following design criteria apply to Alternative 2.

### 1. Fuels

- a) In precommercial thinning treatments and fuelbreaks, mechanical treatment of fuels would be used if possible. Areas not treated mechanically would be manually thinned with the resulting slash piled and burned or otherwise disposed of.
- b) Whole-tree yarding would be the preferred method of slash treatment for all harvest activities except shelterwood seedcuts (to comply with Forest Plan guideline 1102a<sup>1</sup>) and overstory removals (to protect pine regeneration). If whole-tree yarding is used in overstory removal treatments, regeneration would be protected. Methods may include but are not limited to designation of skid trails by the sale administrator and directional felling of trees to skidding corridors. Whole-tree yarding would be used in other treatment types adjacent to private property, where feasible. Lop-and-scatter fuel treatment would be acceptable where fuel loading objectives would be met.

### 2. Soil and Water

- a) Mandatory management requirements found in the Watershed Conservation Practices (WCP) Handbook (Forest Service Handbook 2509.25) and State of South Dakota Best Management Practices (BMPs) would be applied to proposed activities for protection of soil and water.
- b) Many proposed activities would take place on soils identified by the Lawrence County Soil Surveys as having a high erosion risk. Specific implementation criteria have been developed to meet the soil and water standards in the Forest Plan and the South Dakota Best Management Practices. The specific areas of concern are identified in the project file.
- c) If wet soils or slide areas are identified during project layout or implementation, the District Hydrologist would be consulted prior to any ground-disturbing activities to identify appropriate avoidance measures.
- d) Cutting unit boundaries in sites 82102-07 (commercial thin), 82102-14 (precommercial thin), and 82108-13 (overstory removal) would remain outside the Water Influence Zone associated with adjacent wetlands. See stand map in Appendix C.
- e) Reconstruction of NFSR 248.1A would be conducted using filter strips or other means to prevent sediment from entering the adjacent wetland. Heavy equipment would not enter the wetland. Material would not be excavated from or stored in the wetland.

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<sup>1</sup> To be treated as a standard under the Phase 1 Amendment.

### **3. Snags and Down Woody Material**

- a) Retain five square feet per acre of basal area in the largest size class available in overstory removal treatments for future snag recruitment.
- b) Existing snags would be retained unless they pose safety hazards to workers or the public. Where possible, any snags cut because they are safety hazards would be left on site rather than salvaged or skidded to landings.
- c) If standard 2308 (retention of down woody material) conflicts with direction regarding fuel loading or visual quality, standard 2308 would take precedence.
- d) Cull logs or felled cull trees greater than 10" DBH would be left on site or returned to the site in stands where whole-tree skidding takes place to contribute to nutrient cycling and provide habitat for small wildlife species

### **4. Sensitive Plants**

- a) Known occurrences of sensitive plants and high-quality habitat would be protected from disturbance during proposed activities. High-quality habitat and areas of known occurrences are identified in the botanist's report in the project file. Treatment boundaries near these areas would be established under direction of the botanist to exclude high-quality habitat and areas of known occurrences. Mechanical disturbance (e.g., due to landing and skid trail placement) that might occur outside of treatment units would be assessed by a botanist prior to implementation.
- b) Bristle-stalk sedge (a sensitive species) occurs in stand 81128-13. This stand is proposed for commercial thin under Alternative 2 and is adjacent to a proposed POL/PCT and meadow enhancement in both action alternatives. This occurrence and adjacent suitable habitat would be designated as "no entry" for all activities. Treatment boundaries around this area would be established in coordination with a botanist.
- c) One large round-leaf orchid (sensitive species) occurrence is surrounded by units proposed for prescribed burns and commercial thins under both action alternatives (stands 70204-05, 70204-07, 70204-08, 70204-21, and 70204-22). This occurrence and surrounding suitable habitat would be designated as "no entry" for all activities. Treatment boundaries around this area would be established in coordination with a botanist.
- d) No treatment would take place in the approximately six-acre western lobe of stand 0702030014 due to steep slopes and moist soils.
- e) Fuel treatments proposed under Alternative 2 on Strawberry Hill (stands 82109-13, 82109-36, and 82109-23) would focus on removal of live and dead bug-infested trees and thinning excessive stems to create canopy gaps. To prevent disturbance of damp soils and sensitive plant habitat, the treatment would not take place on the lower parts of the slope where spruce is the dominant overstory.
- f) The standard North Zone seed mix (specifications dated April 29, 2004 or later) would be used for reseeding disturbed areas.

### **5. Noxious Weeds**

- a) Guidelines to prevent the spread of noxious weeds due to prescribed fire, road work, and timber harvest activities, identified in the BHNW Weed Management Plan (approved January 18, 2003), would be included as appropriate in contracts and permits issued as part of this project. Post-sale activities may also include herbicide treatment of noxious weeds in disturbed areas.

- b) If activities are planned in areas infested with noxious weeds considered to be at high risk of spread, off-road equipment associated with the activity would be washed before leaving the site to prevent spread of weeds. Noxious weeds have been found in parts of the following sites proposed for treatment:

Location	Site/s
70203	06, 09
81128	10, 72
82102	03, 05, 08, 19
82108	13, 17, 22, 35, 38, 69
82109	28, 33

## 6. Rangelands

- a) All pasture gates would be identified on Timber Sale Area maps and kept closed during the grazing season, generally June through mid-October. Maintained fences would be protected during logging operations.
- b) Roads, landings, and slash piles would be located out of meadows and draw bottoms whenever possible to reduce loss of forage.
- c) Cattleguards, fences, spring developments, and water storage tanks would be protected and maintained for the duration of the proposed activities. These improvements would be identified on Sale Area maps. Range improvements damaged during implementation of proposed activities would be repaired or replaced. Timber sale purchasers would be responsible for maintaining cattle guards put in place to facilitate timber sales for the duration of the timber sale contract period.
- d) If proposed activities result in the loss of an existing natural barrier that prevents unintended cattle movement, construction of a replacement fence or other barrier would be coordinated between the district range program and the resource area responsible for the change.

## 7. Recreation

- a) Snowmobile trails would be shown as improvements on Timber Sale Area maps and protected during harvest operations. An evaluation of the potential for conflicts between logging and trail use would be made at the time of timber sale appraisal and contract preparation. If conflicts appear likely, logging would be restricted in affected areas between December 1 and March 31 unless a logical and desirable alternative snowmobile route is identified. Only those units and/or roads in conflict would be restricted so that logging operations could proceed in the remainder of the sale area. Stands proposed for commercial harvest that are currently crossed by snowmobile trails include:

Location	Site/s
82102	07
82108	06, 17, 30, 31, 33, 46, 47, 48

- b) Winter operations of timber sale units that necessitate skidding across a snowmobile trail but do not otherwise affect the trail may be allowed. Determination would be made on a case-by-case basis, with crossings permitted only at locations approved by the sale administrator and with proper cautionary signing installed by the contractor.
- c) Appropriate signing or other cautionary measures would be implemented to protect public safety. Implementation of these measures would be the responsibility of the party initiating the action (e.g., logging contractor, prescribed fire manager).

## 8. Heritage Resources

- a) All culturally sensitive areas, Traditional Cultural Properties, and sites eligible or potentially eligible to the National Register of Historic Places would be avoided under proposed activities with a 60-meter (200-foot) buffer. Other mitigation identified in the project file for each property would be required during implementation of the project. Heritage site locations or specific mitigation is not identified in this EA to protect site integrity.
- b) In the event that culturally sensitive areas, Traditional Cultural Properties, or sites eligible or potentially eligible to the National Register of Historic Places cannot be avoided, or new heritage resources are found during implementation of the project, the sale administrator would stop all activity in the affected area and notify the District Archeologist. Appropriate consultation with the State Historic Preservation Office, Tribal Historic Preservation Offices, Native American tribes, American Indians, and other applicable parties would take place as directed by Section 106 of the National Historic Preservation Act.

## 9. Scenery

- a) Within 300 feet of primary travel corridors (U.S. Highways 85 and 385, Forest Highway 17, and snowmobile trails), whole tree yarding would be used where possible and desirable.
- b) Areas of disturbed soil would be recontoured to blend in with the adjacent topography and seeded.
- c) Harvest unit boundaries would mimic natural landscape patterns where possible.
- d) The Forest Landscape Architect would be consulted on and/or participate in the design and implementation of treatment in stands 70204-15, 70204-29, and 82108-17 to ensure Forest Plan scenic integrity direction is met.

## Monitoring

The District ID team would monitor implementation of Alternative 2. All ID team reviews would be documented and a final monitoring report completed after project implementation.

The timber sale administrator or other contract administrators would be responsible for some of the project implementation monitoring. Other resource specialists would monitor specific design criteria and mitigation measures related to their particular resource area. The following monitoring is prescribed for this alternative.

- Foresters would monitor conifer regeneration in shelterwood seedcuts one, three, and five years after harvest to assess stocking and need for site preparation or planting.
- The District archeologist would monitor known heritage sites eligible or potentially eligible to the National Register of Historic Places before and after project implementation.
- Prescribed fire managers would establish photo points in prescribed burn units to compare pre- and post-treatment conditions and document fire behavior during implementation.
- Fuels staff would evaluate effectiveness of fuel treatments in reducing fuel loading.
- Fire managers would evaluate burned areas to establish a timeline for maintenance burning.
- Fire and range managers would monitor regrowth of forage after prescribed burns in meadows to determine the need for temporary modification of the livestock grazing system.
- Project managers would monitor revegetation of disturbed and burned areas to determine need for additional measures and noxious weed control.
- Timber and wildlife staff would sample snag densities before and after timber harvest to determine the need for snag creation.
- Wildlife staff would monitor known and possible goshawk nests annually for nesting activity.
- Botany staff would monitor sensitive plant populations near proposed treatment areas during

- project layout and implementation.
- Engineering and hydrology/soils specialists would monitor effectiveness of erosion control measures (seeding, water bars, etc.) one and three years following installation.
- Hydrology/soils staff would monitor soil compaction at a sample of timber sale landings and harvest units.
- Travel managers and wildlife staff would sample road closures for effectiveness.
- Timber sale administrators and hydrology/soils specialists would monitor application and effectiveness of Best Management Practices.
- The District planning team would monitor timber sale layout to evaluate project implementation and assumptions used in the planning process.
- The District planning team would monitor timber sale implementation following sale closure.
- The District planning team would monitor implementation and effects of sanitation treatments after during implementation and following completion of each group of treatments comprising 100 acres.

*Figure 2-1. Alternative 2 Vegetation Treatments (West Half)*

See pdf Maps section to view Figure 2-1.

*Figure 2-2. Alternative 2 Vegetation Treatments (East Half)*

See pdf Maps section to view Figure 2-2.

*Figure 2-3. Alternative 2 Transportation System (West Half)*

See pdf Maps section to view Figure 2-3.

*Figure 2-4. Alternative 2 Transportation System (East Half)*

See pdf Maps section to view Figure 2-4.

### **2.1.3 Alternative 3**

#### **Focus of Alternative 3**

Alternative 3 was developed to emphasize scenery and wildlife habitat values. As compared to the proposed action, this alternative would leave more dense stands on north-facing slopes for wildlife habitat. To emphasize scenic values and benefit species that use larger trees, there would be no overstory removal treatments.

This alternative includes hardwood enhancement treatments to remove conifers that are encroaching on aspen. Conifers would be removed from within and up to 120 feet from existing clones. Between aspen clones, conifers would be thinned to 40 to 80 square feet of basal area (about 20 to 30 feet between trees 12" DBH). All conifers would be removed from two sites (70203-09 and 81128-07). Some of the stands identified for hardwood enhancement are currently identified as having a ponderosa pine overstory. The treatment would convert these stands to aspen cover type.

Similar to Alternative 2, this alternative includes fuel breaks and fuel treatments. Fuel management would, however, take place on fewer acres. Approximately 776 acres of prescribed burning would overlap proposed commercial thinning (406 acres), meadow enhancement (37 acres), hardwood enhancement (292 acres), and shelterwood seed cut (41 acres). Approximately 22 acres of fuel break would overlap commercial thinning (11 acres), pre-commercial thinning (3 acres), and shelterwood seed cut (8 acres). Alternative 3 would treat fuels on approximately 170 acres designated as WUI and on 87 acres adjacent to CARs.

Ongoing road maintenance, noxious weed management, grazing, and activities in existing timber sales would continue according to existing management plans.

Treatment types would be the same as those described under Alternative 2 (pp. 1-5) with the addition of hardwood enhancement (321 acres). This alternative would produce approximately 3.6 MMBF (~7,200 CCF) of sawtimber and wood products.

Easements may be necessary to harvest stands 81128-05, 81128-07, 81128-38, 81128-42, and 81128-77 located in Sections 7, 17, and 18, T. 4N., R. 4E., as described on p. 4 for Alternative 2.

Acres and miles associated with Alternative 3 are reflected in the following tables and figures. Stand-by-stand proposals are described in the project file. A comparison of alternatives can be found in Section 0. A stand map is included in Appendix C.

*Table 2-3. Vegetation Treatments - Alternative 3*

Vegetation Treatments	Acres Treated
Commercial thinning	592
Shelterwood seed cut	427
Meadow enhancement	79
Products other than logs/Precommercial thinning	203
Precommercial thinning	28
Hardwood enhancement	321
Fuel treatments (prescribed burning)	1,125
Fuel treatments (fuel breaks)	89

*Portions of treatments overlap.*

*Table 2-4. Transportation Management - Alternative 3*

Transportation System Changes	Miles
New road construction	1.8
Road reconstruction	8.2
Road maintenance	5.2
Roads decommissioned	10.1

## Design Criteria

Design criteria found on pp. 5-8 apply to Alternative 3, with the following modifications.

**2d:** Delete (treatments are not proposed in these stands under Alternative 3).

**2e:** Delete (248.1A is not proposed for reconstruction under Alternative 3).

**5b:** Sites proposed for treatment in which noxious weeds have been found:

Location	Site/s
70203	06, 09
81128	10
82102	03, 05, 08, 19
82108	17, 35, 38, 69

**7a:** Sites proposed for commercial treatment currently crossed by snowmobile trails:

Location	Site/s
82108	06, 17, 30, 31, 33, 46, 47, 48

**8e:** Delete (treatment is not proposed in these stands under Alternative 3).

**13b:** Delete (treatment is not proposed in this stand under Alternative 3).

## Monitoring

Monitoring items found on p. 8 apply to Alternative 3, with the following addition.

- Silviculture and wildlife staff would monitor hardwood enhancement treatments to determine effectiveness in increasing hardwood extent and structural diversity.

*Figure 2-5. Alternative 3 Vegetation Treatments (West Half)*

See pdf Maps section to view Figure 2-5.

*Figure 2-6. Alternative 3 Vegetation Treatments (East Half)*

See pdf Maps section to view Figure 2-6.

*Figure 2-7. Alternative 3 Transportation System (West Half)*

See pdf Maps section to view Figure 2-1.

*Figure 2-8. Alternative 3 Transportation System (East Half)*

See pdf Maps section to view Figure 2-1.

## **Treatment Timing**

The National Forest Management Act generally prohibits the harvest of stands before they reach their maximum growth rate (NFMA, 16 U.S.C. 1604(m)). Exceptions in the law allow the harvest of individual trees, or even parts or whole stands of trees, before this time to thin and improve timber stands and salvage damaged stands of trees (part m1 of the law). Further exceptions are allowed in order to achieve multiple-use objectives other than timber harvest (part m2).

Alternatives 2 and 3 would harvest some stands before their maximum potential growth rate has been reached. These harvest treatments are consistent with the exceptions provided in part m2 of the law, and include precommercial thinning, commercial thinning, hardwood enhancement, meadow enhancement, products-other-than-logs thinning, sanitation, and fuel treatments. These treatments are proposed to meet Forest Plan multiple-use objectives stated earlier in this assessment.

## **2.2 Consistency with Forest Plan and Phase 1 Amendment**

The Forest Plan and Phase 1 Amendment contain direction in the form of Forest-wide and management area goals, objectives, standards, and guidelines. Standards are limitations on management activities. Deviation from a standard requires a Forest Plan amendment. A guideline is a preferred course of action, and deviation is permissible if the Responsible Official documents the reasons for the deviation. Under the Phase 1 Amendment, certain guidelines are to be treated as standards (USDA Forest Service 2001a). Goals are broad, general statements of desired end results of management, and objectives describe measurable desired results to work towards achieving goals.

This project is within the scope of the Forest Plan analysis, and contains no unusual or extraordinary features or circumstances. A full accounting of project compliance with Forest Plan and Phase 1 Amendment direction is located in the project file. Both action alternatives considered in detail meet Forest Plan and Phase 1 Amendment direction.

## **2.3 Alternative Development Process, Including Alternatives Considered but Eliminated from Detailed Study**

The ID team developed the proposed action to meet objectives identified through a comparison of existing conditions and Forest Plan direction. Timber harvest, fuel treatments and transportation proposals were modified as a result of public scoping and refinement of resource condition information. This revised proposed action formed Alternative 2.

Alternative 3 was developed in response to scoping. It emphasizes scenery and wildlife values, and differs from Alternative 2 by retaining more dense forest habitat and enhancing more aspen stands.

The ID team also considered other alternatives. Following are brief descriptions of alternatives not considered in detail and the reasons for eliminating them from detailed analysis.

**Emphasize forest health treatments.**

Several comments were received suggesting an alternative that emphasized forest health and a treatment of all or nearly all stands susceptible to mountain pine beetle infestation. Other comments suggested treating all stands at high risk from wildfire. Both action alternatives include proposals to substantially reduce acreage at moderate and high risk of beetle infestation and reduce fuels to avoid catastrophic wildfire, consistent with Forest Plan direction. Acres at high risk of infestation would decrease by 42% under Alternative 2 and by 34% under Alternative 3. It would not be possible to treat all areas susceptible to beetle infestation or fire without substantial negative effects on soils, sensitive species, and scenic values. Areas left untreated under Alternative 2 either were treated recently or could only be reached for mechanized treatment by construction of lengthy roads on steep, unstable, or highly visible slopes. Extensive manual treatments were not proposed due to prohibitive cost.

**Maintain sufficient road infrastructure to support multiple uses.**

Comments were received expressing the opinion that the project would close too many existing roads. These members of the public wanted the project to maintain sufficient road infrastructure to support recreational uses, fire suppression, and management access. Both action alternatives include road closures but are designed to maintain sufficient roads to facilitate multiple-use management of the area. Twenty-four miles of road would remain open on National Forest System lands under Alternative 2 (2.77 miles of open road per square mile of land) and 25 miles under Alternative 3 (2.86 miles per square mile). No roads that are likely to be needed for future management would be decommissioned. Additional information is contained in the roads analysis report in the project file.

**No commercial timber output.**

A comment was received suggesting no commercial timber be harvested during vegetative treatments. This alternative could address the purpose of and need for action to a limited degree by reducing hazardous fuels in some locations, but not where continuous fuels are created by dense stands of mature trees. It would contribute little towards the need to provide a sustainable supply of timber because stands would not be thinned to increase growth or regenerated to provide a future supply. In addition, prescribed burning could not safely be conducted without mechanical pre-treatment of some areas to reduce potential fire intensity. Commercial harvest can be useful in accomplishing these and other objectives. The timber purchaser completes much of the work as part of timber harvest, and timber sales provide funding for post-sale activities via Knutson-Vandenberg. Appropriated funding is not sufficient in itself to accomplish needed vegetation management. Moreover, the Forest Plan allocated the area to MA 5.1, where timber harvest is an appropriate tool for accomplishing management objectives. Given these factors, the Responsible Official chose not to analyze this alternative in detail.

**Decommission the maximum amount of roads.**

A comment was received suggesting that an alternative be developed that only decommissioned roads or decommissioned the maximum amount of roads. This alternative could address the purpose of and need for action to a limited degree by reducing disturbance of wildlife and decreasing maintenance costs. It would not address the need to reduce hazardous fuels because forest density, continuity of fuels, and fuel loading would not be reduced and the ongoing beetle infestation is likely to continue to grow, creating hazardous fuels, if not addressed through vegetation management. It would not address the need to provide a sustainable supply of timber because untreated stands would continue to be highly susceptible to beetle attack and resulting tree mortality and because growth may stagnate if stand density is not reduced. Both action alternatives would decommission about 10 miles of road. The roads analysis determined that these roads could be permanently closed without hindering future management. The planning team felt that removal of additional roads at this time could foreclose future management options.

An alternative consisting solely of road closures was not analyzed in depth due to the area's allocation to MA 5.1 and the identified needs associated with widespread mountain pine beetle infestation and presence of hazardous fuels.

**Change management area designations.**

A request was received to change all Management Area 5.1 to 4.1 (Limited Motorized Use and Forest Products Emphasis). The same respondent suggested designating all habitat structural stage (HSS) 4C (mature, dense) stands as Management Area 3.7 (Late Successional Forest Landscapes).

The Forest Plan assigned a management emphasis to each part of the National Forest. This designation can be changed at the project level if another designation is found to be more appropriate. MA 4.1 was assigned to areas suitable for non-motorized recreation and production of timber, forage, visual quality, and a diversity of wildlife (USDA Forest Service 1997a). "Motorized road travel is limited to designated routes... [which] will vary over time based on the need to do vegetative management. Generally the road system will be closed to motorized travel" (Forest Plan guideline 4.1-9102). Off-road motorized travel is prohibited (standard 4.1-9101). MA 5.1 in the Mineral project area includes US Highways 85 and 385, Forest Highway 17, and NFSRs 248 and 534, all of which access private land, are used for recreational and other purposes, and would not be appropriate to close. Therefore, the Responsible Official decided not to analyze this alternative in detail.

MA 3.7 is assigned to areas hundreds or thousands of acres in size that currently include late-succession forest and can be managed for these characteristics on a landscape scale. Assigning this designation to individual stands as suggested would not meet the landscape-level intent of the management area. For these reasons, this alternative was not analyzed in detail.

**Buffer potentially hazardous snags.**

A requested alternative that would leave an untreated buffer around potentially hazardous snags was considered but not analyzed in detail. The objective of this alternative, retention of snags, is addressed under both action alternatives by measures prohibiting cutting of snags except under limited circumstances. This alternative would be problematic to analyze because density and potential hazard of existing snags are not known. These factors would have a substantial effect on analysis of effects. For example, if a stand averaged four snags per acre, each 30 feet tall, a buffer equal to snag height around each one would consume about 26 percent of the stand. If 74 rather than 100 percent of the stand were harvested, effects and outputs would be substantially different from those disclosed in the EA. A more feasible approach to maintain snags in treated areas is to emphasize snag retention during sale layout and implementation, monitor snag density and the effectiveness of prescribed mitigation, and reserve the option of creating snags (see design criteria and monitoring sections).

## 2.4 Comparison of Alternatives

Table 2-5 compares activities proposed under the alternatives. Figures are approximate. Treatment definitions and descriptions are located starting on page 1. Hardwood enhancement is described on p. 14.

*Table 2-5. Comparison of Alternatives*

Activity	No Action Alternative	Alternative 2	Alternative 3
<b>Vegetation Management Treatments (in acres rounded to the nearest whole)</b>			
Commercial thinning	0	1,350*	592
Overstory removal	0	464	0
Shelterwood seed cut	0	193	427
Meadow enhancement	0	79	79
Products other than logs/ precommercial thinning	0	203	203
Precommercial thinning	0	763	28
Hardwood enhancement	0	0	321
Fuel treatments (prescribed burning)	0	1,127	1,125
Fuel treatments (fuel breaks)	0	169	89
<b>Transportation Management (in miles rounded to nearest tenth)</b>			
New road construction	0	3.1	1.8
Road reconstruction	0	10.4	8.2
Road maintenance	0	7.7	5.2
Open roads	42.5	30.5	30.3
Roads open seasonally	0.2	0	0
Closed roads	14.9	15.9	15.0
Roads decommissioned	0	10.5	10.1

*\*Includes approximately 70 acres of hardwood enhancement (see treatment description on p. 1).  
Portions of treatments overlap.*

Table 2-6 displays the response of each alternative to the issues. All figures are approximate.

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*Table 2-6. Response of Alternatives to Issues*

Issue	No Action Alternative	Alternative 2	Alternative 3
<b>Issue 1: Effects of Vegetation Treatments on Wildlife Habitat</b>			
Threatened and endangered species	No effect	No effect	No effect
Sensitive species	No immediate effect	May adversely impact some individuals, but no loss of viability on BHNF	May adversely impact some individuals, but no loss of viability on BHNF
Management indicator species	No immediate effects	No negative effects on trend of habitat or population	No negative effects on trend of habitat or population
<b>Issue 2: Travel and Access Management</b>			
Miles of open roads	42.5	30.5	30.3
Miles of road open in summer	.2	0	0
Miles of road closed year-round	14.9	15.9	15.0
Miles of road decommissioned	0	10.5	10.1
Miles of road per square mile	4.1	3.3	3.1
Deer and elk habitat effectiveness	Habitat stable	Habitat effectiveness improves or remains stable	Habitat effectiveness improves
<b>Issue 3: Forest Health (Fuels and mountain pine beetle infestation)</b>			
Acres of commercial, POL, and precommercial thinning	0	2,316	823
Acres of prescribed burning	0	1,127	1,125
Acres of fuel breaks	0	169	89
Acres of WUI treated	0	185	170
Acres treated adjacent to CAR	0	91	87
Acres of pine at risk of mountain pine beetle infestation	Low: 2,379 Medium: 914 High: 1,881	Low: 3,811 Medium: 441 High: 922	Low: 3,351 Medium: 608 High: 1,215
<b>Issue 4. Timber Production</b>			
Potential sale volume	0	6.2 MMBF (12,400 CCF)	3.6 MMBF (7,200 CCF)
Percent of National Forest System lands in project area suitable for timber harvest identified for treatment	0	54%	38%
<b>Issue 5. Effects of Vegetative Treatment on Scenic Values</b>			
Acres of treatment in high Scenic Integrity Objective areas	0	1,054	733

\* Some fuels treatments overlap other treatments, as explained under the discussion of each alternative.